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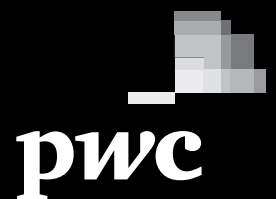
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Aspects of Peripheral Regions

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*Opinions expressed in economic perspectives are
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This is the 4th in a series of 'Special Issues' on public policy related issues. This issue presents a diverse selection of papers on peripheral economies. These are a sample of papers presented at an international conference of the Regional Studies Association (RSA) research network on Peripherality, Marginality and Border Issues in Northern Europe in September 2012. The papers are diverse in terms of the geographical areas they focus on, both within the UK and its neighbours in the Nordic countries. The methods are diverse, as are the disciplinary backgrounds of the participants. The seven papers straddle economy, environment, society, geography and narrative. They touch on subjects as diverse as crime and bioenergy, and issues as wide ranging as marginalisation to social attitudes in post-industrial communities.

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The relevance of the periphery for economic policy

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This special issue of the Fraser Economic Commentary presents a diverse selection of papers on peripheral economies. These are a sample of papers presented at an international conference of the Regional Studies Association (RSA) research network on Peripherality, Marginality and Border Issues in Northern Europe in September 2012. The conference was hosted by the University Centre of the Westfjords in Ísafjörður, Iceland. This followed previous successful standalone events organized by the network in Norway and Scotland, as well as various special sessions at other RSA events. The papers are diverse in terms of the geographical areas they focus on, both within the UK and its neighbours in the Nordic countries. The methods are diverse, as are the disciplinary backgrounds of the participants.

Arguably studying the development of peripheral economies and communities has not been at the leading edge of intellectual fashion. The focus has been on developing the centres and the narrative has emphasised an urgency to stimulate their competitiveness in a global bidding war for footloose businesses and high-skill workers. The ascent of New Economic Geography (NEG) has exerted considerable gravity on policy discourse. The standard NEG model (e.g. Fujita, Krugman & Venables, 1999), ascribes local economic development to two forces: agglomeration economies and congestion. The first acts as a centripetal force, pulling towards fewer and larger centres, whereas the latter acts as a centrifugal force pushing towards more distributed economic activity. As the founding father of NEG intended (Krugman, 2010) the simplicity of the model, with its derivation from few axioms, has attracted the interest of mainstream economics to the role of space in shaping economic development. Indeed, it has triggered a wave of publications. See for example Schmutzler (2003) and Candau (2008) for an overview. Furthermore, it has influenced policy makers as for example manifested in the 2009 World Development Report "Reshaping Economic Geography (World Bank, 2009).

The simplicity and clarity of the NEG model has, however, had an unfortunate unintended consequence: a tendency to reduce regional policy discourse to the sole confines of NEG. This is of course by no means universal, but there are certainly examples of influential actors in the policy discourse making radical policy prescriptions, at least implicitly, on the premise that NEG is an accurate and complete description of reality. This is not the case as critics of NEG are quick to point out (Ganetsen & Martin, 2010) nor the intentions of the school's founders (Krugman, 2011). However, as any observer of the history of economic thought will know, there is always the risk that a neat piece of theory will be taken overly literally. It should be self-evident that analytical clarity is not obtained for free, but comes at a cost. The more abstract the model, the more simplified its take on reality and hence greater care needs to be taken when distilling policy prescriptions based on such mechanisms.

NEG does not assign an active role to the periphery. Rather it is implicitly treated as a residual: What remains once the centres have been shaped by the tug-o-war between agglomeration and congestion. And why should it? The main purpose of the theory is to explain the formation of and pattern of urban centres. When are they large and when are they small? The economics of the periphery needs its own models, where the trade-off between nuance and analytical clarity is determined by the needs of policy analysis in the periphery.

Policy making would be easier if reality was simpler. Hence the temptation to believe NEG to the letter is understandable. However, it is not sensible. The periphery should not be a passive respondent to policy making formulated around global cities. The interdependencies are too large to ignore. Indeed, there are signs the intellectual pendulum is swinging back. A tentative sign is the recent statement by the Chancellor of the Exchequer to embrace policies for a regionally driven growth strategy. Furthermore, leading regional scientists have presented evidence to the effect that the potential for economic growth in Europe's leading cities is reaching saturation and competitiveness is increasing faster in smaller cities (Boersma & van Dijk,

2008). Indeed, this is quite in line with the prescriptions of NEG, but somehow the positive story of agglomeration economies has much more appeal than the disappointing effects of congestion.

Against this backdrop the aim of this issue is to showcase some of the emerging thinking on peripheral economies in the British Isles and the Nordic Countries. In the first section we shall discuss the concept of peripherality and the diverse and decentralised 'school of thought' that is emerging from participants in the PEMABO network. In our first paper, the instigators of the PEMABO Network, Professor Mike Danson of Heriot-Watt University in Edinburgh and Peter de Souza of Högskolen i Hedmark, in Norway, discuss the PEMABO agenda, drawing on lessons from the Innovative North. The second paper in this section, by Dr Jan Stanley of Arizona State University, USA, invokes the methods of creative non-fiction writing to capture impression of the mosaic, which emerges where people of different nationalities and professional backgrounds unite to share experience of development in the periphery. The third paper in this section is contributed by Dr Gylfi Magnusson, of the University of Iceland and former minister for business affairs in the caretaker government formed in the aftermath of Iceland's financial meltdown in 2009. Gylfi illustrate how industrialisation and urbanisation shaped the geography of Iceland's population distribution in the 20th century.

The second section looks at the potential of new energy sources in the periphery. Dr Kristinn Hermannsson and Professor Kim Swales of the University of Strathclyde in Glasgow, present two papers analysing the production of marine bioenergy from harvested seaweed in the Western Isles. In the first paper they examine the tension between economic development and emissions reduction. Producing biogas from seaweed can reduce greenhouse gas emissions by displacing fossil fuels. However, the process stimulates economic activity, which triggers new 'downstream' emissions. The two countervailing effects are estimated and contrasted using an extended Input-Output model of the Western Isles. Their second paper compares and contrasts the estimated benefits of the project using cost benefit analysis and cost per job. The analysis suggests the project is not feasible from an environmental point of view in isolation, but could represent a cost-effective regional policy with additional benefits from reduced emissions.

The third section explores the role of social factors in influencing the out-migration of young people from the periphery, drawing on anthropological approaches. Maria Vallström of Uppsala University in Sweden, examines the development of single industry communities in the periphery. Lotta Svenson, also of Uppsala University, examines the out migration of young people from small communities in Sweden.

Finally, in the fourth section, Dr Stuart McIntyre of the University of Strathclyde, examines how economics affects social outcomes. In his paper he analyses the interrelations between personal indebtedness and crime in the North East of England.

References

- Candau, F. (2008). *Entrepreneurs' Location Choice and Public Policies: A Survey of the New Economic Geography*. *Journal of Economic Surveys*, vol. 22, no. 5, pp. 909-952.
- Fujita, M., Krugman, P., Venables, A.J., (1999). *The Spatial Economy: Cities, Regions and International Trade*. MIT Press, Cambridge.
- Garretsen, H., & Martin, R. (2010). *Rethinking (new) economic geography models: taking geography and history more seriously*. *Spatial Economic Analysis*, vol. 5, no. 2, pp. 127-160.
- Krugman, P. (2011). *The New Economic Geography Now Middle Aged*. *Regional Studies*, vol. 45, no. 1, pp. 1-7.
- Swaffield, J. (2008). *Cities unlimited: making urban regeneration work*. O. M. Hartwich (Ed.). Policy Exchange.
- Schmutzler, A. (1999). *The new economic geography*. *Journal of Economic Surveys*, vol. 13, no. 4, pp. 355-379.
- World Bank (2009). *Reshaping Economic Geography*. *World Development Report 2009*. Washington: The International Bank for Reconstruction and Development / The World Bank.

Peripheries – the agenda

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The innovative northⁱ

According to analysis for the European Commission, three of the four leaders in innovation in the European Union are the Nordic countries of Denmark, Finland and Sweden – Germany being the other (Innovation Union Scoreboard, http://ec.europa.eu/enterprise/policies/innovation/facts-figures-analysis/innovation-scoreboard/index_en.htm).

Confirming this tendency to modernity and adaptation to the demands of a globalised marketplace, in a similar pan-European study, it has been observed that there are:

“economically successful regions with below average accessibility. Often ... sparsely populated and remote ... in the Nordic Countries, north-east of Spain, Scotland, Ireland and in and around northern Italy. ... Regions in the Nordic Countries, for example, have overcome their peripheral location by capitalising on current strengths in relation to ICT, research, educational and environmental opportunities and less on improving their accessibility”. ESPON (2010), New Evidence on Smart, Sustainable and Inclusive Territories. Polycentric Europe: smart, connected places, First ESPON 2013 Synthesis Report.
<http://www.espon.eu/export/sites/default/Documents/Publications/SynthesisReport/FirstOctober10/fullversion.pdf>.

Contributions to the book on *Regional Development in Northern Europe : Peripherality, Marginality and Border Issues*, (edited by Mike Danson and Peter de Souza, published February 2012, Routledge) include chapters which extend this particular research theme by focusing on specific regions, especially in Scotland and Norway. Around the former, Davies et al. (2012) provide positive answers to the question of “Can peripheral regions innovate?” while in the Norwegian context Bergum (2012) discusses “Proximity and distributed innovations. Innovations ‘in the shadow of the clusters’” revealing that, indeed, the ESPON and CEC findings are transparent on the ground.

These reports suggest that there are lessons to be learned from the northern peripheral regions of Europe in delivering innovation and economic development, complementing the recognised leadership of the Nordic countries of global measures of living standards, equalities, gender balance and other indicators of successful economies and societies (Danson, 2012). Nevertheless, we have felt compelled, due to the consistent appearance of alternative arguments and, although fragmentary, empirical information, to argue that the dominant academic paradigm and policy frameworks in regional development have been working against the needs of these peripheral and marginal regions of the north, with negative repercussions for these communities and European competitiveness overall (Danson and de Souza, 2012b).

Contradictions and the need for a network

In particular, we have demonstrated that there is a need for a better balance in the focus of research and analysis across the continent by showing that, while there has been much research and attention paid to the regions in the core of Europe - and especially to cities, city-regions, old industrial areas, border regions and to some of their underlying characteristics - such as clusters, agglomerations generally, regional innovation systems, the specific features of peripheral and marginal regions have been relatively neglected.

The periphery and margins have not been well served by mainstream regional research, policy and development. Even the concepts and strategies applied to explain, to advantage and to regenerate ‘the problem regions’ have tended to neglect the shadow, weak and tail-end areas within these areas. For example, there has been much written on the Northern Way – the major cities in the regions of the north of England - and the major cities of Scotland, but there has been little academic or policy interest focused on their hinterlands and the small towns of their respective territories.

To begin to address this, a scientific network of academics, practitioners and policymakers dedicated to the peripheral and marginal within Europe's northern periphery has been established with several workshops, publications and a website used to explore and disseminate the knowledge and understanding generated. Amongst the issues we put on the agenda were:

- Whether we can be satisfied with the way that traditional theory is used in relation to the periphery?
- Are the methods of analysis adequate? What is being measured? How is it measured? What is concluded?

What is described in the literature and in policy documents as universal tends to be neither examined nor explored with regard to the periphery with the same emphasis as urban, high-tech structures and processes. Following from this, we cannot discuss the situation in the periphery with the same kind of assertiveness as the dominant tradition when approaching the theory of development, particularly in its growth and urban orientation. When discussing the periphery, the urban is presented as an absolute role model in a dichotomy carrying flavour from absolute good and bad. The 'urban' is also being generalized in such discourses to such a degree that it hides the reality that urban is many things and not all of them beneficial for growth and development (Syrett, 2012; Bosworth, 2012).

So, the field is not only under-researched but it is also, in many aspects, misdirected. The dominant paradigm and its methods, ways to measure, choice of problems/cases are not capturing the complexity of the new (and old) structures and processes that characterize the periphery in its further development. This dominance is so decisive that it seems to reduce most regions to passive by-standers in an urban-driven, centre-dominated, interest-based merry-go-round, exploiting the periphery, margins and rurality to a degree that enhances/exploits and transforms the actual position and role of regions. In parallel to this, the core, capital cities are often – and especially in large countries such as the UK, Spain and France – promoted as the drivers, leaders and funders of the nation, with the 'regions' dependent on hand-outs and subsidies from this rich benefactor.

Theories and dominance: core-periphery poles and oppositions

We concluded fairly early in our discussions that the treatment of the periphery in scientific and popular contexts gives a reading of trends, structures and processes that continue to focus on a clear negative profile. Just think of how the media and public sphere in the UK highlight the problems of the southern periphery of the EU during the current recession and financial crisis; meanwhile, the resilience of the Nordic countries is ignored as it fails to fit the essential discourse of the core. So from theory through policy to analysis, the unchallenged view from the centre is an ill-informed depiction of the northern periphery as 'a basket case': uniformly lagging and failing.

Growth mechanisms are traditionally connected or explained by a focus on the accumulation of factors of production, the relation between these supported by descriptions of efficient redistribution functions, such as financial and labour markets. The competing theories and policy prescriptions of the last quarter century have stressed agglomeration and geographical clustering as a necessary complement of concentration and proximity. Underpinning the European Commission's competitiveness agenda (CEC, 2010) are concepts associated with the New Economy Geography of Krugman (2011) with its arguments for trade based on agglomeration economies, Porter's cluster analysis and strategy - which have been significant in regional, national and EU approaches to development - have favoured the core and metropolitan centres, and the ideas of a creative class proposed by Florida where cosmopolitan cities and centres. The oft-unstated understanding is that, by definition, the regions of the periphery are lagging, uncompetitive and less attractive to mobile and creative labour, losing talent and failing to benefit from brain circulation. Density, as a positive, is taken for granted; and sparsely populated regions at a natural disadvantage.

The theories of localisation and their policy derivatives applied at national and international level therefore not only serve the northern regions poorly by generating barriers to full inclusion in industrial clusters and collaborations but also introduce and consolidate the forces of peripheralisation. Interestingly in our introductory work (Danson and de Souza, 2012b), we trawled dictionaries and thesauri in several languages to explore the origins of 'periphery' and 'marginal' and their contrasting verb, noun, adjective and adverb forms. This revealed how nuances across languages could reveal useful insights into the embedding into apparently neutral terms themselves negative and derogatory attitudes; the alternative meanings attached to the word for 'left' in almost all languages seems similar to us.

Already disadvantaged in a globalising economic world by distances from the core – in miles, time and cost, the positions of the peripheral regions are exacerbated rather than diminished by the cumulative causation processes encouraged by the centralisation and drivers of EU expansion on the continent. But the research of our colleagues across the peripheral north have shown how the Nordic countries, especially, make the greatest efforts to moderate such differentials. The workshop meetings in Rena in the Hedmark region of Norway in 2010 and in the University Centre of the Westfjords, Ísafjörður, Iceland last September – surely the ultra-periphery of Europe – demonstrated how connected and resilient such

communities, and especially where there is support from the capital for both academics and people (Hermannsson, 2012).

Examining the dominance of agglomeration theories has led some to arrive at similar conclusions: "In both academic and policy circles the mechanisms underlying the learning and innovation benefits of agglomeration remain poorly understood" (Crowley, 2011, 18). By extension, we can also consider that, to a much lesser extent, such ugly terms as 'disglomeration' and 'deglomeration' should be considered for relevance and application. Papers on counter-urbanisation, entrepreneurship and virtual regions in and of the periphery offered new areas for analysis and discourse, and critically in ways that would be different from their exploration from core or capital city perspectives. The chapters in the volume dedicated to the discussions by the network are testament to the benefits of such an approach oriented on the periphery rather than on the centre.

And that returns us to asking whether the starting point for discussion of theory in terms of clusters, innovation systems, triple helix, learning regions, etc., is whether these are actually theory constructions in themselves, parts of a larger theoretical construct or primarily policy development/offensive, presenting an aura of academic polish to their efforts to becoming established theory? In other words, is the acceptance and promotion of the latest paradigm, theory or policy outwards from the established core always to be taken as a natural expansion out or should we consider that the fundamentals are so different outwith the centre that relationships, linkages, values and norms should be recognised and their significance evaluated appropriately?

In the shadow of the cluster

There is still much to say or ask for when it comes to empirically defining the structures and processes that constitute the basis for the claimed benefits of these theory and policy packages. And so, we aimed to determine where are the studies that focus on what happens in the shadow or in the tail end of the cluster, and the actual dynamic nature of incomplete networks. Following from these questions we wanted to determine what is happening outside of the cluster; for the rest in the periphery, the small, traditional, and craft sectors and the way this has an impact on the cluster.

For academics, policymakers and practitioners this prompts investigation of the strategic implications of these aspects of enterprises and their business for the cluster and for the periphery. In particular, with the focus on the perceived need for prioritisation of selected key sectors at all levels and geographies, we are led to ask what happens outside of these favoured environments as a consequence. This is not unrelated to parallel debates over general support for new start enterprises and picking winners, only here the bias seems to favour the core under all regimes where neo-liberalism reigns.

In such discussions and collaborative research, participants outwith the capitals and metropolitan areas are more likely to question whether the unchallenged and constant claims for success of economic growth where centralization/urbanization takes place is consistent with reality. Related to this is whether the urban/centre is a consequence of or a prerequisite to economic growth as there are opportunity costs to the attendant decisions over public expenditure and investment financing.

As proposed in the introduction, one of the fundamental issues is arguing that the core, centre, capital, urban dimension sets the agenda in analytical as well as policy terms as a general system-defining collection of characteristics. This bias, of being a model for development and growth, will have its direct bearings on choice of theory, methods and analytical variables, and, through this have weighted implications for the analytical outcome, and evidently on policies and implementation.

One of the obstacles agreed at meetings of the network across different national and geographical boundaries has been over the relationship between the statistical/empirical base and its role in defining the bounded entity or place, and further on in specific spatial categories. Different definitions of the boundary, minimum scale, geography, community etc. from core and peripheral perspectives therefore tend to disadvantage attempts to undertake research in and of more remote, sparsely populated or isolated territories. The clusters research and strategy in Scotland was a case in point where the failure to recognise space or distance doomed that approach to failure in such a diverse country (Danson and Whittam, 2001).

In scientific analysis, monitoring and evaluation, there has been an increasing tendency to give priority to what is easily quantifiable. The focus on performance indicators, targets, outputs and outcomes in the UK Treasury's Green Book (HM Treasury, 2003), in EU structural fund programme operating plans and deliverables (Scottish Government, 2009) and in other forms of assessment dependent on scoring and quantification (e.g. the approaches of the World Bank, IMF, OECD, Scottish Enterprise) is problematic for peripheral northern regions in two respects. Sparsely populated areas have greater diversity of experiences and higher costs of identifying and collecting data than communities and economies in the core; these undermine the efficiency and effectiveness of standard applied analyses. Second, the aims and objectives captured by the measures and data forms expected and used are based on the norms, processes, relationships and input-output linkages of the mainstream economy – the periphery is evaluated as if it was like the core, implicitly competing with the core, in an aspatial formless environment.

In specific cases, such as the Highlands and Islands of Scotland, 'national' surveys may not even cover their area and population, biasing the aggregate in hidden ways not immediately apparent to the analyst.

Analogously, the choice of variables in the analyses and the methods applied may not be geography-neutral and so disadvantage the hinterland and marginal, oblivious to connections and relationships that are not relevant to all areas or which fail to accommodate differences (Mønness and Arnesen, 2012). So, rather than an apparent uniform dependency of the rural, lagging periphery on the dynamic capital and core, our participants frequently revealed and described where the composition of economic activities, of historical dimensions, confirmed that urban development needed the periphery in absolute terms. Beyond the basics of food, water and energy, research by Andersen et al. (2012) demonstrated the critical environmental, social and spiritual roles delivered by the rural, small town and traditional communities outwith the congested metropolitan areas.

Relating back to the elements of innovation and regeneration, there were numerous instances of new economic activities being developed, increasing value added in old branches in the periphery – in traditional primary and process sectors (Lindegaard, 2012), and offering new opportunities and industries in renewable energies (Callaghan et al., 2012), creative activities and experiential economies (Lorentzen, 2012). With new economic activities complementing and replacing existing economic structures in the periphery, there is an inherent significance to be addressed that can be lost in the shadows of existing agglomeration-focused strategies and research (Crone, 2012).

Several papers at the workshops argued that the rural/peripheral is not necessarily an exclusive economic, or more correctly market, issue and so that externalities need to be recognised and accounted for in general analyses. Compounding the measurement and data considerations described above, therefore, challenging the definitions peculiar to the mainstream of central processes like innovation and entrepreneurship can lead to changes in the perception of peripheral activities (Herrschel, 2012). Research on community levels of activity in remote and difficult environments revealed higher degrees of dynamism and achievement than would be suggested by standard analyses of what appears to be enterprising and innovative (Fuduric, 2012; Granqvist, 2012).

In the discussions over HS2 in the south of the UK, there have been a few voices reminding those promoting the regional economic development potentials of the well-established two-way road problem. This exemplifies that changes in different dimensions of transport and information infrastructures change the preconditions of local economies everywhere; greater connectivity and the eastward expansion of the European Union have made the peripheries of the north relatively more disadvantaged yet most analyses of trans-European networks and ITC neglect such negative impacts. Papers on the obverse effects and on strategies to ameliorate these unintended consequences were to the fore in Ísafjörður especially, but also raised in all workshops. Jan Stanley (2013) in this Special Issue describes some of the practical examples observed in the field in Iceland while contributors to the edited volume as well as this Issue analyse the forces, funds and facilitators behind such initiatives.

Alongside globalisation and associated crises and recessions, climate change and environmental concerns have put the non-urban potential in the limelight, again. Leading and accommodating efforts to address issues around the pursuit of renewable energies and sustainable development are described in all our meetings, with chapters on the practicalities and processes by several authors.

Outputs and summary

From the outset, the network some of whose work is disseminated here, has been concerned with the position and attention given to peripheral and marginal regions across the globe, but particularly within a Europe where cities and city-regions are dominating the research and policy agenda. The website pemabo.net has been established to support the dissemination of research from across northern Europe, foster knowledge exchange and contribute to more significant cooperation across borders. All academics, practitioners and policymakers with an interest in these issues is welcome to join. In providing this platform we are maintaining the pursuit of our initial primary objectives:

- define the state-of-the-art re concepts of periphery, marginality and border issues in theoretical, methodological and practical dimensions
- promote scientific discussions and contributions progressing theoretical and methodological issues in relation to peripheral, marginal and border region issues
- create a platform for the combination of intellectual discussion and practical endeavours in this special and specialised field of regional development, issues and practice
- develop this discussion directly and through the presentation of empirical studies creating a foundation for comparative research on a wide geographical scale
- further contribution to the organisation of scientists and regional actors and policymakers in this field and complementary to the organisation of a scientific and practical network.

With the acknowledgement that 'periphery' and 'marginality' are special dimensions, versions or variants of this framework, the rationale remains:

- there are not many studies which consider them generally
- even as state-of-the-art research, they are quite fuzzy concepts in spite of their noted presence
- the opportunity is offered to improve understanding of what promotes and hinders growth and development, in the non-core regions but also more generally
- better analysis and knowledge of the areas in the periphery themselves is generated, although much of the interesting material describes the uniqueness of each and every region

Observations that have become apparent over these five years of the network include:

- All presenters live in and work in the northern periphery of Europe.
- The counterfactual is a legitimate area for research.
- The core exclusively sets the agendas leading to misguided analyses, actions and policies; the imposition or encouragement of solutions to non-problems; the coercion into adopting inappropriate approaches; and attacks on property rights.
- The differences in gross and net impacts can be particularly important in small, isolated and remote regions with the need to examine the particulars of leakages and spillovers to understand local economies better; this is often not the case in the core or in the heart of the agglomeration.
- Dynamic effects and cumulative causation often work to the detriment of the periphery and benefit of core.
- Experiences and research outputs suggested that rural and remote areas often demonstrate a better work-life balance for the population, suggesting that there are societal benefits to be pursued in redefining respective roles and influence of the periphery and core in this and other spheres.
- Social capital within (bonding) and between (bridging) communities is often critical to these regions but underplayed, as if the conditions were the same everywhere. Promoting active links within the community of peripheral and marginal regions may be the policy prescription locally, in contrast to a market solution in the core.

Developing from this and the foregoing, it follows that networking and partnerships between these regions, rather than with their respective cores and capitals along vertical supply chains and channels of power, holds much promise for mutually beneficial learning and dissemination of good practices. And it follows that there is merit in the dissemination of successful role models from regions, their actors and analysts to promote the voice of the periphery and the marginal to each other, to themselves and to Europe.

References

- Arnesen, T., Overvåg, K., Skjeggedal, K. and Ericsson, B. (2012) 'Transcending orthodoxy: the multi-house home, leisure and the transformation of core-periphery relations', in M. Danson and P. de Souza (eds.), 18-195.
- Bergum, S. (2012) 'Proximity and distributed innovations – innovations 'in the shadow of the clusters'', in M. Danson and P. de Souza (eds.), 134-147.
- Bosworth, G. (2012) 'Commercial counterurbanisation in the rural periphery', in M. Danson and P. de Souza (eds.), 148-163.
- Callaghan, G., Danson, M. and Whittam, G. (2012) 'Economic and enterprise development in community buy-outs', in M. Danson and P. de Souza (eds.), 196-211.
- CEC (2010), *Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth*, Brussels. Available from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>
- Crone, M. (2012) 'Re-thinking 'peripherality' in the context of a knowledge-intensive, service-dominated economy', in M. Danson and P. de Souza (eds.), 49-64.
- Crowley, C. (2011) 'Geography, advice seeking and innovation', *Regional Insights*, 2, 1, 18-20.
- Danson, M. (2012) Presentation to "Growth versus the Scottish Government's 'Golden Rules' and Economic Strategy", Economy, Energy and Tourism Committee and Scottish Trades Union Congress Seminar, 13-20, Scottish Parliament, http://www.scottish.parliament.uk/S4_EconomyEnergyandTourismCommittee/General%20Documents/Proceedings_v2.pdf
- Danson, M. and de Souza, P. (eds.) (2012a) *Regional Development in Northern Europe : Peripherality, Marginality and Border Issues*, Abingdon: Routledge.
- Danson, M. and de Souza, P. (2012b) 'Periphery and marginality: definitions, theories, methods and practice', in M. Danson and P. de Souza (eds.), 1-15.
- Danson, M. and Whittam, G. (2001) 'Power and the spirit of clustering', *European Planning Studies*, 9 (8), 949-963.
- Davies, S. Michie, R. and Vironen, H. (2012) 'Can peripheral regions innovate?', in M. Danson and P. de Souza (eds.), 118-133.

- Fuduric, N. (2012) 'Entrepreneurship in the periphery: a resource perspective', in M. Danson and P. de Souza (eds.), 164-181.
- Granqvist, M. (2012) *The political entrepreneur as an unconventional problem solver in a Northern Periphery*, in Danson and de Souza (eds.) *Regional Development in Northern Europe : Peripherality, Marginality and Border Issues*, Abingdon: Routledge, 232-246.
- Hermannsson, K. (2012) 'The Periphery and its Host Economy: Symbiosis, exploitation or burden? Conference Report', *Regional Studies Association Research Network on Peripherality, Marginality and Border Issues in Northern Europe*, Accessed 31st January 2013, <http://www.regionalstudies.org/uploads/events/documents/periphery-and-its-host-economy-conference-report.pdf>.
- Herschel, T. (2012) 'Regionalisation and marginalisation: bridging old and new divisions in regional governance', in M. Danson and P. de Souza (eds.), 30-48.
- HM Treasury (2003) *Green Book*, Accessed 31st January 2013, http://www.hm-treasury.gov.uk/data_greenbook_index.htm
- Krugman, P. (2011) 'The new economic geography, now middle-aged', *Regional Studies*, 45, 1, 1-7.
- Lindegard, K. (2012) 'Dynamics of peripherality', in M. Danson and P. de Souza (eds.), 78-97.
- Lorentzen, L. (2012) *The development of the periphery in the experience economy*, in M. Danson and P. de Souza (eds.), 16-29.
- Mønness, E. and Arnesen, T. (2012) 'A domicile principle in farm policy: on farm settlement policy and experience in Norway', in M. Danson and P. de Souza (eds.), 212-231.
- Scottish Government (2009) *European Structural Funds Evaluation Plan for 2007 - 2013 Programmes*, <http://www.scotland.gov.uk/Resource/Doc/917/0084386.pdf>
- Stanley, J. (2013) 'Perimeters, margins and borders: a developing mosaic', *QEC*, this edition.
- Syrett, S. (2012) 'Conceptualising marginalisation in cities and regions', in M. Danson and P. de Souza (eds.), 65-77.

ⁱ We continue to evolve our discussions as to how transferable the research and experiences in the 'Northern Periphery' are to the 'north' and to the 'periphery' each more broadly defined. Feedback is continuing to be gathered from academics and practitioners across Europe and beyond and comments are welcome.

Perimeters, Margins and Borders: A Developing Mosaic

Jan Stanley, Arizona State University

Introduction

In her book "Finding Beauty in a Broken World," environmental and ecosystems writer Terry Tempest Williams (2008) described the art of creating mosaics. She discussed the process of cutting and placing small colored tiles called tesserae to form the work's images. Cut, color and placement work together to move light across the piece, illuminating and bringing the completed mosaic to life. Intentional, subtle variations in the hue of individual tesserae accent and give depth to the work, often blending to suggest a consistency of color that is not really there. Perception varies depending on the position of the viewer—the mosaic is seen differently up close than from a distance and again differently from varied angles. Spaces between the tesserae contribute to this. In the play of light and definition of images, interstices and irregular edges are as important as the tesserae themselves. In Tempest Williams's words, the "gaps between the tesserae speak their own language," and "there is a perfection in imperfection." Readers are reminded often that "the play of light is the first and last rule of mosaic." (p 5)

These lessons of mosaic are useful in considering the work and experiences of the Regional Studies Association Network's Peripherality, Marginality and Border Issues in Northern Europe (Pemabo) conference on peripheral economies. The conference convened at University Centre of the Westfjords in Ísafjörður, Iceland, September 3-4, 2012, with many attendees extending conference-related activities to include a bus trip on September 5. Conference participants were social scientists from varied disciplines, regions and countries. With one exception, all lived and worked in Europe, mostly Northern Europe. A United States citizen from a large metropolitan university in that country's Southwest, I was the exception and attended as a result of my interest in peripheral, marginal and remote areas and the people who value and inhabit them. More generally, my interests and education are in individual and collective human development and environments that support this development. I was new to the group and new to the area of study.

Conference presentations and discussions centered around three themes: Smart Sustainable Growth in the Periphery, Implicit Interregional Social Contracts, and Current Practice and Research of Peripheral Regions. These themes presented different perspectives from which to view conference discussions, as did the orientations of the social science disciplines that were represented. The location of this gathering in a remote area on the western periphery of Europe made explicit another element, remoteness, for consideration.

As a whole, the conference was composed of smaller elements of varied shapes and hues. Each cast a different light on the work undertaken, and the definite spaces between them were as important as the elements themselves. Some of the conference's most pressing questions formed in the interstices between disciplines and varied units of analysis as findings from one perspective complicated understandings gleaned from another. Necessarily fluid definitions of terms like peripheral, marginal and remote along with the nested character of variable scales of analysis complicated syntheses of research and experience, as described earlier by Danson and de Souza (2012).

The still incomplete mosaic of the conference fits within the growing global mosaic in which it is nested and that helps to create and refine a usable picture of peripheral, marginal, border and remote areas worldwide. These nested mosaics grow in significance as localities, regions, nations and international organizations (i.e., nested scales of action) seek to address issues related to the three themes of the Pemabo conference and to do this in a coordinated manner. Yet, these efforts continue to be complicated by variations between scales of analysis and action, fluid definitions and disciplinary orientations, and by

borders and boundaries. From a perspective now more distant in time and space, the conference mosaic, like its global context, illuminates lessons and questions for consideration by researchers, policy makers and residents of areas considered peripheral, marginal, borderland or remote. Work that refines or transcends these considerations and pursues the associated questions is likely to provide direction for future decisions related to the areas under discussion.

Context Matters

All work related to peripherality, marginality and borders starts from a position on one each of at least three dimensions: unit or scale of analysis, disciplinary orientation of researchers and policy makers (Colini, 2012), and locality (which may include factors such as geography; social norms, values and histories; residents' self-perceptions; possibilities for economic development or decline; transportation, etc.). The position taken on each dimension creates an investigative context for the work and helps determine what questions can be addressed and what understandings, directions and outcomes appear for consideration.

Like the cut of tesserae, different contexts reflect differently on the issue at hand. Sometimes findings that appear contradictory or inconsistent within one context are explained when considered in an investigative context shaped differently by choice of position on one of more of the dimensions above. The interdisciplinary nature of the Pemabo conference afforded opportunity to resolve seemingly inconsistent findings by discussing issues from differing perspectives.

An Example: Social and cultural history and local norms make a difference.

Across Europe and the U.S., a common pattern is found among previously hub communities that become peripheral or marginal: An event increases hardship or limits economic development (e.g., natural disaster, factory or mine closing, redirection of transportation corridors, etc.). Residents begin to leave due to, for example, fear or perceptions of limited opportunity. A diminishing tax base limits options for municipal updating and repairs. Insiders and outsiders begin to think of the community as dying and the decline gathers momentum until the once vibrant community is abandoned. Studies using large data sets at regional units of analysis are helpful in identifying this pattern but cannot explain why a few communities survive disruptive events while others do not. The Pemabo conference demonstrated the value of interdisciplinary discussions and firsthand experience in refining related understandings.

As part of the conference explorations, the staff of University Centre of the Westfjörðs arranged for participants to learn more about the remote Westfjords outside of Ísafjörður, which with a population of about 2,800, is the region's urban center. With the modernization of its small fisheries-based economy and the centralization of government, finance, commerce, media, education and culture to the south in Reykjavik, the Westfjords have seen significant out-migration in recent years while the population has mushroomed in and around Reykjavik. National debates continue about the equitable distribution of resources and services across the resultant rural-urban divide (Bjarnason, 2012; Weiss, 2012).

After the first day's workshop sessions, we boarded a bus in wind-driven, horizontal rain and left for two destinations. A long, forked tunnel through the mountains made these destinations accessible from Ísafjörður. At the first stop, we sat on narrow, straight-backed pews in a small, darkening church on the property of a local farmer. The church was the original home church of the bishop for the surrounding area. In the social history of Iceland, the presence of such a church on a farm signified the landowner's position of power, influence and responsibility within the widely dispersed community (Oslund, 2011). The church still serves the community on special occasions. For practical reasons, electricity has not been added to the structure. Evening services are illuminated by candles if necessary.

Our host held our attention easily as he discussed the value and concerns of marginal areas. He had prepared for this discussion and, with work stiffened hands, checked his notes on a folded square of paper as one of our group translated his remarks. His arguments were relevant to our purpose, concise and carefully considered. They supplied new information about the area and the potential social value of the ecology and way of life.

He talked about changes telling us that his sons grew up before construction of the tunnel we had just traveled. They left home for school in Ísafjörður in the fall and came home for the summer. In between, he saw them at Christmas and Easter. Now, he Skype's regularly, unless there is a power outage, with a son and grandsons that live in Denmark. This gentleman's commitment to place was clear and touching,

though not sentimental, when he stated matter-of-factly, “There are things that we know here that are important and should be remembered. They are not known in the same way in other places.” He took seriously his responsibility to pass this knowledge forward.

The second stop was in a small fishing village close to the farm if travelling by boat across the fjord but more distant via the other fork in the road through the tunnel. In this village, we ate dinner in a restaurant that was opened to accommodate our group after its seasonal closing. While rain poured and wind persisted outside, we enjoyed Icelandic hospitality inside. Owners and staff offered choices and generous portions of traditional local foods, graciously served and fairly priced.

Our hosts were willing to make this effort so that we could learn about the needs and character of this area. Like the farmer, the people of the restaurant allowed our group to invade their space and time because they are committed to place and to the success and character of their community and region. They value and enjoy their lives in this remote area and, consistent with Icelandic history and culture, believe that with hard work and determination they will succeed with this place that is theirs. As a result, they appear to be actively engaged in an evolution of place that blends local culture with a changing economy in a changing world.

Earlier that day, conference presentations by two anthropologists (Vallström, 2012; Svensson, 2012) described the negative effects of diminishing populations, limited economic opportunity, and associated derogatory perceptions of place on residents of a small Swedish community. Small group discussions with community members revealed limited hope for or commitment to the survival of their town. The experience of visits to the farm and restaurant seemed inconsistent with not only these findings but also the common experiences of decline in small communities across Europe and the U.S. However, the same two research presentations along with others earlier that day identified, within a closer unit of analysis and the disciplinary orientations of anthropology and education, factors that helped explain why some communities may rally while others slowly fade away.

By incorporating resident's perceptions of self and place, these studies found that positive perceptions of place, feelings of individual efficacy, and opportunity to contribute to or make a difference in the community were related to the positivity of residents' outlook, efforts to preserve place and willingness to stay. Further, gender differences were associated both with who stays or leaves and, also, with motivation to pursue, and opportunity to use, advanced education to benefit community development (Edwardsdóttir, 2012; Elíasdóttir, 2012; Svensson, 2012; Vallström, 2012).

Together, evening experiences and conference discussions helped refine and extend understandings and suggested a need for multidimensional research and policy decisions that incorporate factors such as age, gender, social perceptions, educational practices and opportunity for community members to direct or contribute to development in their area. Investigative contexts that differ in unit of analysis, disciplinary orientation and locality add dimension to the developing mosaic. One definition does not fit all—or even one all of the time.

Peripherality, marginality, borders and remoteness are as much matters of definition as location (Larsen, 2003). In addition to creating an investigative context from choices related to unit of analysis, disciplinary orientation and locality, discussions of peripherality, marginality, borders and remoteness also presume variable and comparative definitions of those terms. These definitions are affected by scale of analysis and issues of locality so that areas considered peripheral, marginal, borders or remote from one point of view may not be from another. Marginalized areas are found in the heart of major cities and because periphery is always in relationship to someplace else, the same area can be peripheral and not peripheral simultaneously depending on the context referenced. Suburbs are peripheral to the urban centre but not to the metropolitan area as a whole. Further, both marginality and peripherality have a way of changing with development over time. The addition of modern transportation corridors to, near or around an area can move that area into or out of peripherality fairly quickly, for example (Stelder, 2012).

Relatedly, problematic issues for these areas can be related to situation-specific definitions that are often more precisely understood from the perspective of local context than from the distance of regional policy and governance. For example, Ísafjörður is only remote when weather comes in or the wind blows strong from the wrong direction making too dangerous either visual flight reference landings (required for this airport) or use of a unidirectional runway that is squeezed between mountain and fjord. At other times, access to the area is reasonably easy and efficient by domestic airline (Weiss, 2012). As with variable investigative contexts, fluidity in definitions makes generalizations difficult, but tailoring definitions to

address situation-specific issues will increase efficiency in clarifying and addressing those issues of concern.

Definition establishes comparison.

Terms used to identify the areas discussed here and throughout the Pemabo conference are comparative by nature. A place can only be peripheral in relationship to someplace else, for example. Typically, comparison of peripheral, marginal and remote areas is to an urban setting along with the associated, assumed standards of progress and life style (Fuduric, 2012). A tendency to focus on elements of these standards that are missing rather than what of value is present in outlying areas creates a deficiency model for them, limits perceptions of value within them and adds to the assumption that the flow of services and resource is largely unidirectional—from the city into outlying areas. As a result, contributions of the peripheral, marginal and remote areas (e.g., ecosystem services, diversity of lifestyle and cultures, open landscapes and working knowledge of local ecosystems) are easily overlooked in balance sheet discussions (see de Souza and Danson, 2012; Vallström, 2012). This seems a serious oversight as the search for sustainable practices grows in global importance and the world population expands.

Problems of definition can be ameliorated by keeping in mind that labels used to identify areas are simply heuristics. The earth is one continuous planet that people divide, evaluate and label for political, socio-cultural, scientific and other reasons (Berg and van Houtum, 2003). It is possible to suspend or transcend these divisions and evaluations in order to address issues of concern. Larsen (2003) demonstrated the utility of this in his discussion of multinational efforts to correct environmental degradation of the Baltic. A regional view that considers urban core, peripheral, marginal, border and remote areas as one nested ecosystem may be useful for some purposes and help to identify areas of added value from outlying areas. The ecosystem services research and, possibly, hedonic economics may be useful in efforts to quantify value.

One solution does not fit all—or even one all of the time.

Urbanization tends to homogenize and control originally diverse landscapes and cultures and even to moderate some seasonal changes (e.g., climate controlled building, salted streets, etc.) through the application of standardized expectations, services and regulations (McDaniel, 2005). In contrast, geographical, cultural and seasonal differences are important in efforts to address issues commonly associated with peripheral, marginal, border and remote areas. As a result, common practices of wide application in urban areas are unlikely to be as consistently effective outside of the city, and given the diversity of outlying areas, effective solutions in one area may not work in another (OECD, 2006).

In developing policy and determining new directions, the mosaic of economic, geographic and social factors at work matters. Interdisciplinary Pemabo conference discussions were helpful in identifying factors likely to confound results, suggesting that broad, transdisciplinary perspectives will be helpful when addressing issues of concern in peripheral, marginal, border and remote areas. The adaptable and inclusive setting of University Centre of the Westfjords supported interdisciplinary collaboration as participants assembled from experiences and research transdisciplinary pictures of peripherality, marginality, borders and remoteness.

Seeing Is Understanding Better

Early on the final day of the Pemabo gathering, most of the workshop participants took a 12 hour trip through the Westfjords to Reykjavik. Even in the rain, the open, mountainous terrain was stunning as we travelled around and above fjords on switch-backed, “improved” gravel and paved roads that narrowed to one lane in some areas. Transitional summer-into-autumn colors and light hinted at what winter must mean in this region and highlighted terrain that changed between rocky slopes, grasslands, mud flats, and rock beaches as the road rose and fell. Sheep, clearly unthinking and oblivious to vehicular dangers, wandered, relaxed and darted across the road unpredictably. In the course of the day, we met a few passenger cars and squeezed past a few large trucks. Stops were scheduled for scenic areas, lunch, coffee, dinner and visits with local business people and town leaders.

At our lunch stop, another restaurant that had closed for the season was reopened to accommodate our group. The restaurant owner/cook provided a generous, serve-yourself lunch and listened to the discussion as we ate. The town's young, female mayor joined us for lunch, using a PowerPoint presentation in her discussion of the town's carefully considered efforts to maintain a viable existence. She

discussed her development plans and hopes for the future and described her efforts to attain the town goals.

An early priority for the mayor had been accomplished through a business sponsorship that supported construction of a community swimming pool; she knew her town as an outsider would not. For residents of small Icelandic villages, the swimming pool is as much a gathering place for social interaction as a place for exercise. It is a centerpiece necessary for building and maintaining a viable community. This town is building its own future and appears cautiously hopeful about their chances for success.

Another stop at the curved end of a remote fjord was distant from towns. A portable building or two stood on a long, rock beach damped by cold rain and striped with red seaweed. Large tubes stretched from the shore to ringed pens in the centre of the fjord. This was an organic salmon farm that supplies, among other places, a natural foods supermarket chain, Whole Foods, with fresh organic salmon across the U.S. The business owner met us on the beach and explained that remote but accessible fjords are necessary to meet the organic designation requirements and transportation needs of this operation. For the health of the salmon, the farm must relocate periodically.

Harvested salmon are transported in vats of iced sea water on semi-trailer trucks to Keflavik International Airport (hours distant near Reykjavik) via the same route that we traveled by bus. Fish are then transferred to airplanes for the trip to their final destination. Timely transportation schedules are critical. The magnitude of this undertaking for trucks loaded with sloshing water and salmon is barely comprehensible after traveling this route in a large, sheep-dodging bus. The possibilities for problems seem insurmountable. Yet, at home in Arizona, my son buys his fresh, organic salmon at Whole Foods.

The trip through this remote area expanded understandings of the challenges faced by residents of Westfjords. Talking with the people of these areas deepened appreciation of the resilience, determination, knowledge of the area and just hard work required for success. As a whole, visits to peripheral, marginal and border areas, remote or not, afford insight into the many often unique and always interacting factors involved in the success of these areas. Further, local knowledge of place is valuable; if I intended to build or improve a road through this area, our experienced, skilled and unflappable bus driver would be high on my list of people to consult. He understands in ways unavailable to outsiders the transportation requirements of Westfjords. Local knowledge is important in designing effective policy. Experience of place suggests value.

The trip suggested other factors of importance, some of which are particularly difficult to quantify: the restorative power of natural landscapes for ecosystems and for people; the power of community, hope and commitment to place; the ability to live in isolation without forgetting the bigger picture of a wider community; the geography of food production, safety and health care (travel to medical facilities is slow at best and not possible in bad weather). All are tesserae in the mosaic of remote areas that are also peripheral, marginal or borderlands.

These areas help conserve diversity of culture and geography, preserve and expand knowledge of place and offer options for lifestyle and changing societal directions. Repeatedly, I was struck by the deep appreciation of landscape, resourcefulness, individuality and determined resilience of the people we met. I did not see the quaint little people detached from a changing world living the ways of days gone by that tourist stereotypes of remote areas might suggest. These were people living their lives in and with the context of place. For me, the trip through Westfjords not only expanded understanding of the challenges and contributions of this region but also strengthened my respect for the knowledge of the people who call it home. Seeing is understanding better.

From The Long View

In early autumn of 2012, a group of social scientists gathered to discuss peripheral, marginal and border areas. They brought research findings and experience in these areas to add to existing knowledge and current thinking about associated, pressing issues faced by nations, communities and individuals. Each piece of information excerpted a unique cut from the bigger topic of attention. Each disciplinary and regional perspective shed its own light on the issues at hand. Variations in investigative contexts, fluid definitions and diversity of places studied made difficult summary and synthesis of information but as conference participants went about the business of exploring relationships between the cuts of information, storylines began to appear across the conference mosaic.

One storyline looked at factors such as hope, negative or positive perception of place, and perceived individual efficacy in the survival and revitalization of communities. Another storyline was concerned with processes that create and extend peripheral and marginal areas. Still another part of the picture was filled in by an overlay of remoteness and the special concerns of areas that are both remote and peripheral, marginal or borders. Storylines such as these developed across disciplines and heuristic labels of place. Uniqueness of places added dimension, confounded generalizations and uniform solutions, and illustrated the need to scale policies at local levels consistent with the OECD (2006) recommendation.

As they wove through the conference mosaic, storylines intersected, revealing interactions across investigative contexts; assessment of an area's value influences decisions regarding transportation corridors or resource distribution that affect, in turn, negative perceptions of place and residents' decision to stay or go. Perspectives that transcend individual storylines reveal several places to intervene in this cycle. Larsen (2003) recommends use of storylines in resolving complex issues. The work of the Pemabo conference corroborates this recommendation.

From the long view, storylines transcend disciplinary and regional cuts of information and underscore the importance of transdisciplinary and transregional perspectives. Increasingly, we understand that storylines assemble across a global mosaic with wide consequence. With this understanding, the ability to shift perspectives between small and large scales grows in significance. Work across varied contexts of investigation and action contributes to the growing mosaic, directing and coloring the story told. In this time of accelerating climate change, expanding population, and escalating violence, we cannot afford to leave gaps in the mosaic by devaluing and abandoning spaces, indigenous knowledge of place, or diversity of landscape and lifestyle. Although the picture is not perfect, hope lies in the imperfection and in efforts to resolve associated conflicts one issue and one place at a time.

References

- Berg, E. and van Houtum, H. (2003) 'Prologue: A border is not a border. Writing and reading borders in space'. In E. Berg and H. van Houtum (eds) *Routing Borders Between Territories, Discourses and Practices*, Burlington, VT: Ashgate.
- Bjarnason, Þ. (2012) 'Taxes, transfers and regional equity: The case of Northeast Iceland', paper presented to Regional Studies Association/pemabo Network Conference. Ísafjörður, September 2012.
- Colini, L. (2012) 'Beyond peripherality: Practices in collaborative territorial development', paper presented to Regional Studies Association/pemabo Network Conference. Ísafjörður, September 2012.
- Danson, M. and de Souza, P. (2012) 'Nations and regions in Northern Europe'. In M. Danson and P. de Souza (eds) *Regional Development in Northern Europe: Peripherality, Marginality and Border Issues*, New York: Routledge.
- de Souza, P. and Danson, M. (2012) 'Peripheries—the agenda', paper presented to Regional Studies Association/pemabo Network Conference. Ísafjörður, September 2012.
- Edwardsdóttir, A. (2012) 'Place and space for women in a rural area in Iceland', paper presented to Regional Studies Association/pemabo Network Conference. Ísafjörður, September 2012.
- Elíasdóttir, A. (2012) 'Ísafjörður owns me and I own Ísafjörður', paper presented to Regional Studies Association/pemabo Network Conference. Ísafjörður, September 2012.
- Fuduric, N. (2012) 'Entrepreneurship in the periphery: A resource perspective'. In M. Danson and P. de Souza (eds) *Regional Development in Northern Europe: Peripherality, Marginality and Border Issues*, New York: Routledge.
- Larsen, H. (2003) 'Environmental boundaries of inclusion'. In E. Berg and H. van Houtum (eds) *Routing Borders Between Territories, Discourses and Practices*, Burlington, VT: Ashgate.
- McDaniel, C. (2005) *Wisdom for a Livable Planet*, San Antonio: Trinity University Press.
- OECD (2006) *The New Rural Paradigm*. Available online: <http://www.sourceoecd.org/regionaldevelopment/9264023909> (accessed 10 December 2012).
- Oslund, K. (2011) *Iceland Imagined*, Seattle: University of Washington Press.
- Stelder, D. (2012) 'European peripheries: Accessibility developments 1960-2010', paper presented to Regional Studies Association/pemabo Network Conference. Ísafjörður, September 2012.

Svensson, L. (2012) 'Young people eager to develop the rural areas—how do they arise?' paper presented to Regional Studies Association/pemabo Network Conference. Ísafjörður, September 2012.

Tempest Williams, T. (2008) Finding Beauty in a Broken World, New York: Vintage.

Vallström, M. (2012) 'When reality doesn't correspond to the map: Social and cultural conditions for sustainable development in rural area', paper presented to Regional Studies Association/pemabo Network Conference. Ísafjörður, September 2012.

Weiss, P. (2012) 'Westfjords today', paper presented to Regional Studies Association/pemabo Network Conference. Ísafjörður, September 2012.

Internal migration and population development in Icelandⁱ

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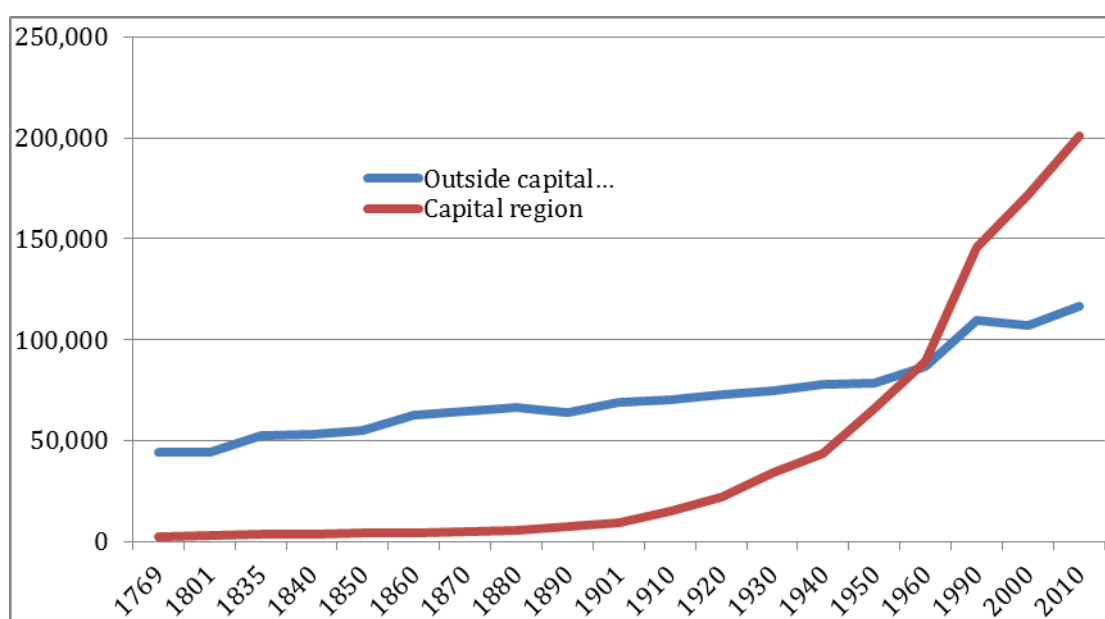
Iceland's settlement pattern has gone through at least four distinct phases. The first phase was when initial settlers came in the ninth and tenth century. They were farmers and the initial settlement pattern reflected the suitability of the Icelandic countryside for farming. Small farms were set up where the land was suitable for the animals to graze that the settlers introduced to the country, in particular sheep, cows and horses. Such farmland was found in the areas near the Icelandic coast, with the highland in the interior of the country being too cold for farming and having little or no vegetation.

The population of the country fluctuated somewhat for the next millenia, dropping in harsh years due to bad weather conditions, plagues or severe volcanic activity. The settlement pattern however remained remarkably stable, with the Malthusian frontier shifting back and forth in the least inhabitable regions but the system of small subsistence farming prevailing, leaving the population at about 50.000 in the long run. There were no significant population centers and practically no infrastructure was developed. This era can be considered the second, and by far longest, phase of Iceland's settlement development.

Rigid social norms aimed at preventing overpopulation tied individuals to farms and hindered marriage of people who were not thought to be able to support a family. Migration from one region to another or even from one farm to another nearby was not an easily available option, neither for farm employees nor leaseholders. Domestic politics were dominated by landowners (freeholders) and farmers had considerable power over those required to live on their farms, both employees and family members. This system certainly did not aid in the development of new industries and may have had a significant effect in delaying the development of domestic fisheries. The old order of the farm-centered society gradually broke down in the 19th century.

The third phase started in the 19th century and lasted until the 1980's or so. See also fig. 1. Early in that phase Iceland finally started developing large-scale fisheries. During the 19th century Icelandic fishermen increasingly switched from open rowing boats to larger vessels with a greater range and capacity. The development of a capital market and the rise of the co-operative movement helped in the switch to more capital-intensive methods than before.

Figure 1: Population development in Iceland 1769-2012.



Source: Statistics Iceland.

This development called for larger villages with a reasonably flexible labor market and proper harbors that could service large vessels. In the first decade of the 20th century the first trawlers were bought by Icelanders and the pace of the movement towards more capital intensive fishing methods increased dramatically, rowing boats were motorized and far larger and more productive vessels taken into use.

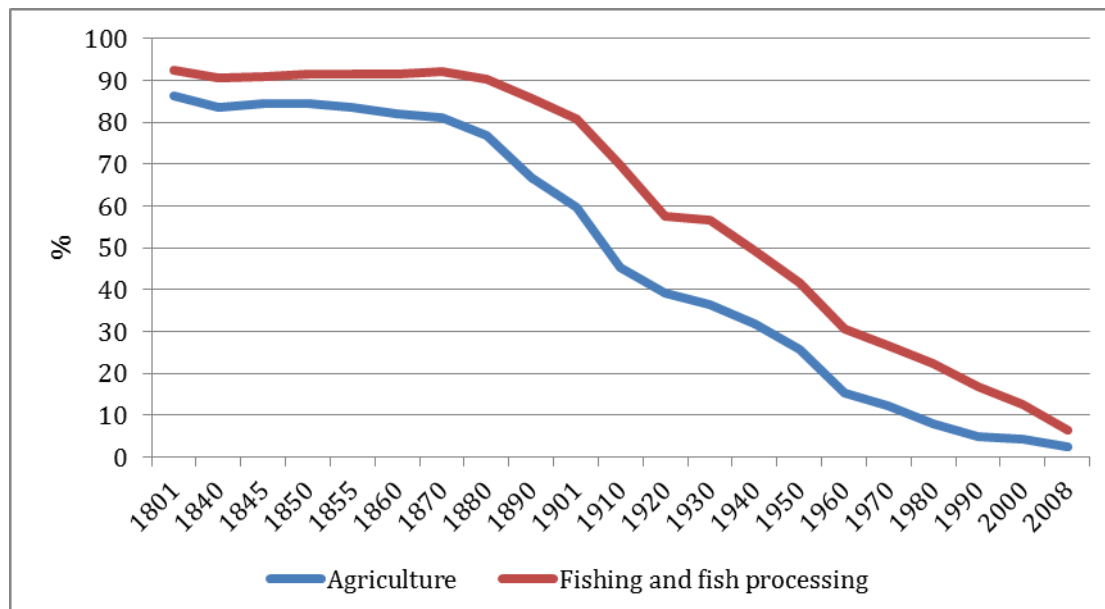
The 19th century also saw the first significant steps towards mechanisation of the economy which continued at an even faster pace in the 20th century. Agriculture was still by far the most important sector in the 19th century but fisheries started growing very rapidly. Other sectors, such as manufacturing and services, also started growing from a very small base.

The growth of the fisheries sector eventually led to the establishment of many small fishing villages, dispersed around the Icelandic coastline. The improved economy meant that Iceland was no longer restricted to having the size of its population determined by the capacity of the country to produce food by traditional farming. The population thus started growing and migrating from the farms to coastal villages. Most of the coastal villages were centered around fisheries and fish processing but they also to some extent became centers for commerce and services for other industries, including agriculture. At the same time the public sector grew. It was predominantly based outside rural areas and disproportionately in the capital.

Until the beginning of the 19th century Icelandic fishermen almost exclusively used open rowing boats for fishing and as late as at the beginning of the 20th century this kind of vessel was still responsible for two thirds of total landings. The very limited range and capacity of rowing boats induced a settlement of fishermen that was spread all along the parts of the coastline where landing was easy and good fishing grounds nearby.

Although most fishing villages were quite small, with perhaps a few hundred inhabitants, this era also saw larger urban centers start to develop. By far the most important one was centered on the capital, Reykjavík. Reykjavík was an important site for fishing early on but more importantly it became the main hub for Iceland's government, manufacturing, commerce and services and grew very rapidly in the first half of the 20th century as these sectors increased in importance. A much smaller regional hub emerged in northern Iceland, in Akureyri.

Figure 2. Proportion of labour force employed in two main primary industries, 1801-2008.



Source: Statistics Iceland.

During the third phase the expansion of the fisheries sector was the most important factor explaining the migration of Iceland's population from rural areas to urban areas on Iceland's coast. Although employment in fisheries peaked much earlier, the fourth phase of Iceland's settlement started when further expansion of the fisheries sector was no longer possible, for biological reasons. The Icelandic fisheries sector had reached the point where increased fisheries were not sustainable. Expanding Iceland's fisheries zone was no longer feasible and many of the fish stocks were showing signs of over-fishing, including the most important one, cod. This became clear in the 1980's and called for the curtailing of catches by introducing various quota systems. Since then the volume harvested by the industry has not shown any long-run growth although it has fluctuated from year to year. The proportion of the labor force employed in fishing

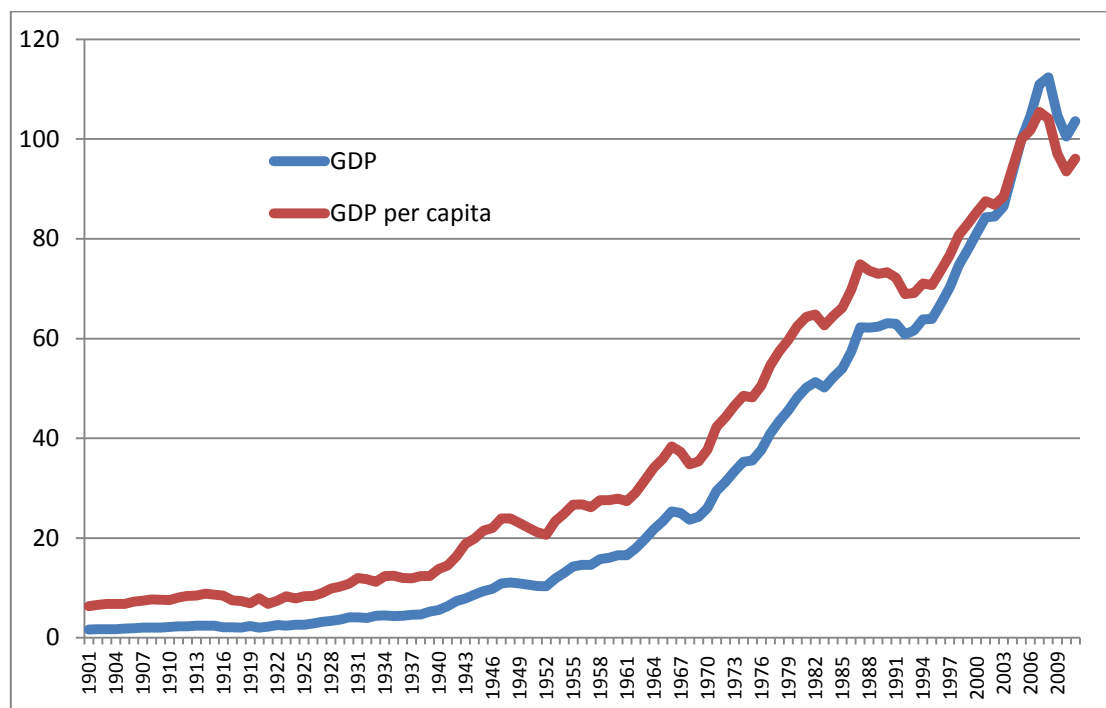
and fish processing also plummeted. It was 14,3% in 1980, only slightly less than in 1940 (17,6%), but had gone down to 4,1% in 2008. See fig. 2 for employment in two primary industries.

This development made it ever harder for fisheries villages to hold on to their population. In many cases it has shrunk considerably in the last quarter century or so. The clearest case is the Western Fjords. This region depended heavily on fisheries, being ill-suited to farming and unable to attract much manufacturing or services. With volumes stagnant and fisheries becoming less manpower intensive with larger and more powerful vessels and better technology the number of jobs in the fisheries sector has kept on falling. At the same time the fish-processing sector increasingly moved offshore, adding to the woes of fishing villages.

The fourth and current phase of Iceland's settlement and migration patterns has thus seen the rise in the total population continue. The increase has however been very much centered on the South-West region of Iceland, with other regions experiencing a stagnant or even declining population with few exceptions. Thus, between 1998 and 2012 the population in South-West Iceland increased by 23,8% while the population of the rest of the country only increased by 0,6%. Growth in the second largest population center, Akureyri, was similar as in the South-West or 18,5%. Areas outside the South-West and Akureyri saw their total population fall. In the Western Fjords the population decreased by 19,7%. Net migration has thus flowed to the South-West from other parts of the country. With young people being most likely to migrate demographics have also changed. The relative lack of young people and women outside the South-West has had an adverse effect on birthrates, which speeds up the depopulation process. Economic development has been the driving force behind migration flows in Iceland since the 19th century. The economic changes have also been very dramatic.

Average annual growth of GDP in the period 1901-1911 was 3,8% and that of GDP per capita 2,5%. This has led to an increase in GDP by a factor of 63 and that of GDP per capita by a factor of 15. It changed Iceland from being a relatively poor country by European standards of the time to being fairly affluent by any standard. Iceland had at the beginning of the 20th century a GDP per capita that was about half of that in Denmark, Iceland's colonial master and a third of that in Britain. By the 1980's Iceland had caught up with its neighbours in GDP per capita although it was and still is lagging a bit in GDP per work-hour. In current USD GDP per capita is now about 36.000, adjusted for differences in price level (PPP). That is a bit higher than the EU average and similar to the other Nordic countries, except Norway. See fig. 3 for economic growth.

Figure 3. Growth of GDP in real terms in Iceland, 1901-2012.



Source: Statistics Iceland.

The high rate of growth of the Icelandic economy since the late 19th century is a symbol of a dynamic and rapidly changing economy. Such a dramatic transformation calls for substantial creative destruction; old techniques and industries are abandoned, replaced by more productive techniques, often in other industries. The population flows have followed, with new jobs not always being created in the same

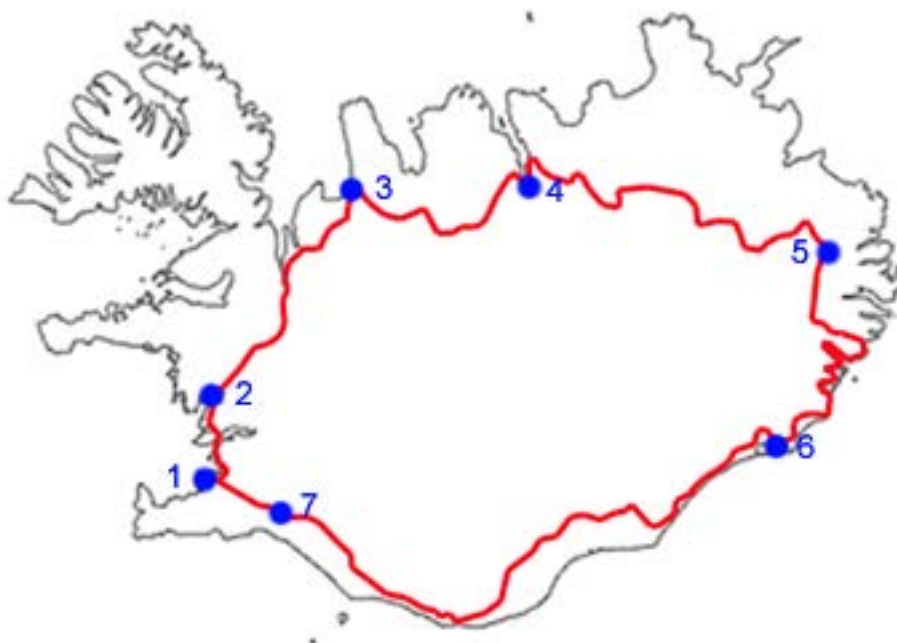
location as the old ones that have disappeared. First, traditional farming was abandoned, leading to depopulation of rural areas and growth of the coastal villages. Then, the coastal villages had a hard time competing with industries growing in larger urban centers, especially the capital region.

The places and industries that have been abandoned did not, however, usually, experience a decline in the absolute standard of living that they offered. Indeed, one could still probably support a family using traditional agricultural methods on one of the many old farms that did just that for centuries. One could not however provide a standard of living that was competitive with what was on offer elsewhere. So, in relative terms, the standard of living that declining industries and places offer has come down.

Urban centers call for very different infrastructure than dispersed farms. To support a large population and improve the standard of living Iceland had to build up centralized networks for water, heating, electricity, sewage and telecommunications. It was a major effort that started in the early 20th century and it took more than half a century to fully provide these essential services for the capital region. Although more remote regions have eventually also been connected to such networks the inhabitants often had to wait several years after access was provided to the capital region. The capital region has especially benefitted from the harnessing of geothermal power for heating houses, making it less costly there than elsewhere in the country on average. In a cold country, that is quite important.

The road network has grown spectacularly for the last century, starting more or less from nothing. A very substantial development was the completion of the so-called ring-road in the mid 1970's. Its completion made it possible for the first time to drive all year round from Iceland's South-West to the South-East without having to drive first to the north of the country. This development has had a significant impact in many ways, both economic and social (Vífill Karlsson, 2012). Villages that the ring-road passes through have a significant advantage over those that are far from the road. In particular the Western fjords are at a disadvantage, being far removed from the ring-road. In addition the road system in the Western fjords, despite substantial investments, still consists of very long and winding roads that snake in and out of the many fjords or cross at mountain passes that often close in winter. In addition, airtravel to and from the region can be hard in winter, with harsh weather and narrow fjords between high mountains often making it unsafe to fly. The region is thus the most isolated in the country of those that are populated at all. This is certainly part of the reason for the net outflow of inhabitants that the region has experienced. See fig. 4 for a map of the ring road.

Figure 4. Iceland's highway 1, the ring-road. The numbers depict main regional centers on the road. 1: Reykjavík. 2: Borgarnes. 3: Sauðárkrúkur. 4: Akureyri. 5: Egilsstaðir. 6: Höfn.



Source: (Vífill Karlsson, 2012).

Migration and regional issues have been on the forefront of the Icelandic political discourse since at least the 19th century. Areas fighting depopulation have generally been able to gather political support for various measures aimed at halting the outflow of people. They have been helped by an electoral system

that has systematically favoured regions outside the South-West, giving them more members of parliament per capita.

Substantial funds have been allocated to assisting industries or companies in such regions and various infrastructure projects have been justified by their regional impact. Subsidies have been paid to reduce cost of transportation, househeating, fuel and other items. Local governments in sparsely populated areas get financial support from a special fund and so on. There have also been some attempts to move government jobs from the capital region by relocating government bureaus or shifting specific tasks to government entities already located outside the capital region. In addition the Icelandic government has provided very substantial support for domestic agriculture, through tariff and non-tariff import barriers and subsidies. This has been justified in the political arena mainly by referring to the need to support settlement in rural areas.

Although some of these measures have undoubtedly had an impact on migration and settlement patterns it is very hard to see that they have in any substantial way affected the greater trends that are driven by fundamental changes to the Icelandic economy. Also, at the same time the capital region has seen its role grow with the expansion of the public sector, as it is the centre for provision of many public services, including health care, education and research, the justice system, government administration and many publicly funded cultural institutions. The public sector has grown phenomenally since the 19th century in Iceland. Government consumption was the equivalent of 1,2% of GDP in 1870 but has grown with little interruption ever since and has in recent years been approximately 25% of GDP. With government services heavily concentrated in the capital region, this has been one of the factors explaining the disproportionate growth of that region.

In addition, the capital area provides opportunities for a far greater variety of leisure activities than smaller villages with the bulk of the country's restaurants, cafés, cinemas, book stores, art galleries and post high school educational institutions, the only opera and the main symphony orchestra, the national library, the two main professional theaters and several smaller ones etc. The accumulation of these cultural institutions in one region has a simple explanation. That is where the bulk of the population is and thus the only market large enough to sustain such institutions. The second largest population center, Akureyri, is large enough to sustain comparable although much smaller institutions in some fields. It houses a university, hospital, theater and concert hall to name a few key institutions. Smaller villages and rural areas can not compete at this level but still often support such institutions as high schools, music schools, amateur theatre, sports teams and of course individual artists.

Conclusion

Changes in the structure of the Icelandic economy have resulted in the migration of a large share of the population to one urban area. About two thirds of the population now live in the capital region while the rest is distributed among many dispersed and much smaller municipalities. As late as at the beginning of the 19th century there was practically no urban population in Iceland.

The Icelandic labor market seems to be efficient in the sense that regional disparities in wages and unemployment are small. Migration has no doubt played a significant role in achieving this as the decline of rural industries has not pushed wages there noticeably below those in the rapidly growing capital region.

Governments have tried various measures to influence migration and in particular to slow the flow to the capital region and improve the standard of living in other regions. No attempt is made here to quantify the effects of previous government actions but it is clear that the instruments used have not reversed the larger trend. The collapse of agriculture as a source of employment and the much more gradual relative decline of fishing and fish processing has eroded the comparative advantage of rural regions over the capital region in the competition for labor.

References

Gylfi Magnússon. (1997). *Internal and External Migration in Iceland 1960 - 94: A Structural Model, Government Policies and Welfare Implications*, Ph.D. thesis, Yale University. Also available as University of Iceland Institute of Economic Studies Working Paper Series no. W98:04.

Vífill Karlsson. (2012). *Transportation improvement and interregional migration*. Ph.D. thesis, University of Iceland.

ⁱ For a much more detailed discussion of these issues and references see (Gylfi Magnússon, 1997).

Economic and emissions impact of producing bioenergy from seaweed

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Biomass is already widely used as a low-carbon source of energy with a range of bioenergy options in use across Europe. This includes everything from traditional sources such as heat from wood-burning stoves to crop-based biofuels and biogas plants using household and farm waste. One of the main drawbacks of many bioenergy sources is that the energy crops displace alternative land use, such as for food production. Seaweed has been suggested as a source of next generation bioenergy to address these concerns. It is harvested and cultivated on a commercial scale in several countries across the world but in most coastal areas it is relatively underexploited and therefore offers significant potential.

The Western Isles, or Eilean Siar in Gaelic, is a council area in the Hebrides of the west coast of Scotland. In 2011 the community counted just over 26 thousand inhabitants residing on 14 islands. Due to a convergence of technical, natural and knowledge capabilities the community in the isles is uniquely situated to pioneer the use of seaweed for production of bioenergy. The islands are situated in waters that produce large quantities of seaweed (macroalgae) that is suitable as marine biomass for energy production. There is already an anaerobic digestion facility in operation in the islands that is used to dispose of household waste and produces both heat and bioenergy as its outputs. Furthermore, there is a wide range of know-how in existing marine-focussed sectors, such as fisheries and aquaculture, that can be drawn on in the development of an algae harvesting sector.

Of the seaweed habitats around the coast of Scotland approximately 1,000km² provide sufficient densities to be commercially harvestable. Approximately a fifth of these are around the Western Isles. Based on sustainable harvesting, seaweed could power more than 2,000 homes in the islands or just over a fifth of the homes in the community. The economic, social and environmental benefits of this are potentially significant.

As we shall see this development would probably not be viable as a standalone commercial venture. However, given existing facilities and availability of subsidies for green energy the prospect could be commercially viable. This is in addition to potential further impetus from social benefits such as the green credentials of the community. Therefore, we set out to estimate ex ante the potential impacts upon the economy of the Western Isles and the potential contribution of this development to reduction of greenhouse gas emissions. It is important to understand the sector's potential economic and environmental contribution as it is futile committing resources to develop this approach unless it can provide a positive impact. This is not complicated in principle, given that detailed information on how to conduct environmentally extended economic impact analyses is widely available in textbooks. However, in practice, this raises some challenges. In particular, as the production sector does not exist any analysis is bound to be somewhat speculative as a result. Seaweed is harvested and cultivated for various uses around the World and various technologies are used to extract energy from biomass. However, these functions have (to the best of the authors' knowledge) yet to be combined.

We start by analysing the potential and feasibility of the new bioenergy sector. Then we use an Input-Output model for the year 2008, based on the Western Isles Economic Accounts, to estimate multiplier impacts. Input-Output is a well-established technique in impact analysis. A particular strength is that it is an accounting framework that allows a detailed identification of the interplay between the different sectors (and sometimes households) of the regional economy. In addition to economic impacts, this can be extended to take account of greenhouse gas emissions. This is important as one of the primary drivers behind developing bioenergy is its contribution towards the reduction of greenhouse gas emissions. However, there are likely to be emissions embedded in the production process and the stronger the economic impact, other things being equal, the more greenhouse gas emissions. Therefore, these two impacts are likely to counteract each other, when it comes to adding up the potential benefits of producing bioenergy from macroalgae.

In the next section we shall briefly outline the feasibility and potential for producing bioenergy from marine biomass in the Western Isles. In the third section we outline the conventional Input-Output framework and

use it to estimate the Output, GDP and Employment impacts of new marine bioenergy activities in the islands. In the fourth section we extend this to look at greenhouse gas emissions embedded in the electricity production. Fifth section concludes.

Energy from marine biomass in the Western Isles

Macroalgae, or seaweed as it is more commonly known, is harvested wild or cultivated for various uses around the World. Around the British Isles seaweed has been put to various uses at different times, depending on availability and price of substitutes. Following the Second World War, resource scarcities stimulated comprehensive survey work of the extent and nature of seaweed off the coasts of Great Britain (Walker 1947ab, 1954ab). Recently, this interest has been revived as seaweed is seen as a potential source of biomass for energy production, that does not suffer the drawbacks of some terrestrial energy crops, such as displacing food production. This has sparked research activity, which is summarised in several recent publications. Kelly & Dworjanin (2008) review evidence on the extent of harvestable macroalgae off the UK coasts and explore the potential for using it as a feedstock for producing bioagas via anaerobic digestion. Bruton et al (2009) examine the potential of marine algae as a source of biofuel in Ireland and Lewis et al (2011) review and compare options for the commercial utilisation of macroalgae in the UK. Hermannsson and Swales (2012) draw on available evidence to estimate the energy potential from sustainable harvesting of wild seaweed in UK waters and examine the feasibility of harvesting seaweed off the Western Isles for local bioenergy production.

An anaerobic digester is a facility where organic matter (e.g. household waste, farm waste, and bio crops) is decomposed to form biogas (a mixture of methane, CO₂ and other gases) that can be used for electricity generation, heating or input into further processing. The Western Isles council has already invested in an AD facility for refuse disposal as landfill options are severely limited by the isles' geography. With this investment already in place the Western Isles are ideally placed to pilot the anaerobic digestion of seaweed on a commercial scale.

Surveying available evidence, Kelly & Dworjanin (2008) conclude that in UK waters there are approximately 1,000km² of habitat where seaweed can be found in sufficient densities to be harvestable. If we focus exclusively on the Western Isles, the macro algae estimated to be harvestable there is approximately 18% of the total in UK waters (Kelly & Dworjanin, 2008, Table 4.1, p. 48) or 180km².

Given available information we can estimate the potential sustainable harvest of seaweed around the Western Isles. We have 180 km² of seaweed forests in harvestable densities. Each plot can be harvested on average every 5th yearⁱⁱ so that every year we can expect to harvest from 36km² of water. As every m² will yield 3.7 kg, each km² will yield 3,700 tonnes (3,7kg x 1,000m²/1000). Hence for 36km² we can expect an annual harvest of about 133,200 tonnesⁱⁱⁱ.

Hermannsson & Swales (2012) draw on information from Kelly & Dworjanin (2008, Table 5.3, p. 73) to deduce the energy yield per tonne of seaweed. If the seaweed is anaerobically digested to produce biogas, which in turn is used to generate electricity each wet tonne of seaweed can be used to produce 64.26 kWh of electricity

Based on our previous estimates of potential wild harvest our annual energy yield could therefore equal 133,200t x 64.26 kWh/t = 8,559,432 kWh/yr. To put this into context OFGEM reports that an average home consumes 3,300kWh of electricity per year and therefore the Western Isles seaweed harvest could potentially support the electricity consumption of 2,594 homes. According to the General Registrar for Scotland there were 12,208 households in the Western Isles in 2011. Therefore, seaweed could potentially provide electricity for 21.3% of households in the isles. This locally produced energy could be used to substitute imports of energy to the islands or exported to the UK grid. In either case, it is a significant boost to the local economy.

1.1 Direct impacts of the marine bioenergy production

Lewis et al (2011) provide a comprehensive overview of the commercial feasibility of AD plants using macroalgae as inputs. They provide a range of scenarios and conclude that given the availability of other (cheaper) inputs such as household waste to complement the seaweed input (for which harvesting costs have to be covered) the AD facility is viable as a standalone commercial entity. However, based on scenarios where seaweed is the sole input the plant is no longer able to cover the full market price of harvesting the seaweed. A cross subsidisation from waste disposal is therefore necessary. In the case of the Western Isles there already is an AD facility in place^{iv}, which is used for refuse disposal and is running under capacity. Therefore we expect the use of seaweed inputs to be viable and concentrate on estimating the economic impact of that production. To further simplify the analysis we assume the AD facility can accommodate the extra input/production at existing staff levels and therefore the direct employment impact occurs through the harvesting sector.

Based on the available information it is simple to derive the direct impact at market prices. Given the maximum sustainable harvest of 133,200 tonnes the AD facility can produce 8,559,432 kWh of electricity per annum (in addition to existing production based on other inputs). We abstract from detailed analysis of the viability of the AD plant and simply assume that this is sufficiently lucrative (with cross-subsidisation from other AD inputs and the fact that investment in facilities has already been covered) to pay a sufficient price for the outputs of the harvesting sector^v. Following Lewis et al (2009) the AD facility has to pay £20 per wet tonne of harvested seaweed or £200 per dry tonne^{vi}.

Input-Output analysis of the economic impact of marine bioenergy

Based on the potential for harvesting macroalgae for energy production as introduced in the preceding section it is possible to determine the direct impact of these additional activities for the economy of the Western Isles. Then the Western Isles Input-Output model is used to derive the economy-wide impacts of the anaerobic digestion of seaweed. Before turning to this analysis it is useful to provide a general introduction to Input-Output models and their use in economic impact studies.

1.2 Input-Output impact analysis

Regional IO impact analyses are frequently used to capture the total spending effects of institutions, projects or events. These analyses incorporate the multiplier, or “knock-on”, impacts of any expenditure injection, obtained by summing the subsequent internal demand feedbacks within the economy. This section briefly outlines the methods adopted by impact studies^{vii}.

Regional demand-driven models, including IO, distinguish between two types of expenditures: exogenous and endogenous. Exogenous expenditures are independent of the level of economic activity within the host economy. In IO studies exports, government expenditure and investment are typically taken to be exogenous. On the other hand, endogenous expenditures are driven by the overall level of economic activity within the host economy. Specifically, demand for intermediate inputs and often household consumption demands are taken to be endogenous. Input Output analysis thus identifies a clear causal pathway from exogenous expenditure to endogenous economic activity.

The derivation of the demand-driven multipliers draws on the notion that exogenous expenditure determines endogenous economic activity. In the standard Leontief Input-Output approach the endogenous vector of final outputs, q , is determined by the exogenous vector of final demands, f , through the operation of the Leontief inverse multiplier matrix. This can be summarised as:

$$(1) \quad q = (1 - A)^{-1}f$$

where $(1-A)^{-1}$ is the Leontief inverse (Miller & Blair, 2009, Ch. 2). The Leontief inverse identifies the indirect and induced effects of any exogenous demand stimulus. Indirect effects arise through increased demands for intermediate goods and, with Type-II multipliers, induced effects are also generated through the impact of increased household income on consumption demand.

These demand-driven models assume that the supply side of the regional economy is entirely passive. This can be motivated in two alternative ways. In the short and medium run such a model applies where there is general excess productive capacity and significant regional unemployment. In the long run, supply-side passivity holds where the supply of the primary inputs of labour and capital eventually becomes infinitely elastic, as migration and capital accumulation ultimately eliminate any short-run capacity constraints (McGregor *et al.*, 1996). The legitimacy of either set of conditions is ultimately an empirical issue. For example, Learmonth *et al.*, (2007) models the island economy of Jersey. Here the labour market is tight and the institutional framework restricts migration so that the supply side cannot be treated as passive over any time interval. Therefore, in the context of a small peripheral economy like the Western Isles, the Input-Output multipliers should be regarded as representing the upper limit of potential impacts.

1.3 Applying Input-Output to estimate the impact of new bioenergy generation

It is evident from equation (1) above that in order to determine the change in output across all sectors (q) produced by bioenergy generation upon the Western Isles, we need to determine the exogenous component of this impact, the change in final demand (f) attributable to these additional activities. The supply chain is simple. Seaweed is harvested and sold to the AD facility, which uses it to produce biogas, which in turn is used to produce electricity. The electricity is then exported to the national grid. These export earnings (price + subsidy) are obtained by the AD facility, which in turn uses the income to pay seaweed harvesters, which use their income to purchase intermediate inputs and labour – hence the multiplier process is set in train. Since we expect the AD facility to be able to meet this additional

production with existing capacity we abstract from their role in the supply chain and simplify the analysis by modelling the sales of the harvesting sector as an exogenous shock. Determining the exogenous income shock to the harvesting sector is straightforward. It harvests 133,200 tonnes of seaweed, for which the AD sector pays £20 a tonne. The total income is therefore £ 2,664,000.

From the Input-Output table we can derive multipliers for how this final demand shock feeds through the economy and impacts different activity metrics, in this case gross output, gross regional product (GRP) and Full Time Equivalent (FTE) employment. We use the multipliers to estimate the knock-on impacts of the additional activity in algae harvesting. These results are reported in Table 1.

Table 1 Final demand and knock-on impacts of algae harvesting the Western Isles, Type-I and Type-II impacts.

	Final demand	Type-I			Type-II		
		Output	GRP	FTE Emp.	Output	GRP	FTE Emp.
Impact (£000's, FTEs)	2,664	4,154	1,407	95.86	4,633	1,848	100.13
% of ES total	0.47%	0.63%	0.39%	1.04%	0.70%	0.52%	1.08%
Multiplier		1.56	0.53	0.036	1.74	0.69	0.038

If we move through the table from left to right we can see that the final demand injection from the additional harvesting activities represents a 0.47% increase in the final demand for outputs of all sectors' in the Western Isles. Based on Type-I assumptions (i.e. accounting for direct and indirect effects) we can see that under these assumptions the increase in output, GRP and FTE employment in the isles amounts to 0.63%, 0.39% and 1.04%, respectively. As expected, the Type-II impacts (direct, indirect and induced effects) are slightly stronger with the change in Western Isles output, GRP and employment amounting to 0.70%, 0.52% and 1.08%, respectively. The direct indirect and induced employment generation could amount to 100 full time equivalent jobs – a significant stimulus for a community of that size. Moreover, the employment intensity ensures that the positive economic impacts are dissipated in the local community. This is in contrast to new developments in many energy production sectors, such as wind or hydro, where there is little continuing additional employment and local impacts are only generated if the host community has access to residual income through ownership or revenue sharing agreement (Allan et al, 2011). However, the strong economic impact raises a further issue that requires careful attention, namely how much greenhouse gas emission will be saved once everything has been added up.

Greenhouse gas emissions

The primary motivation for developing bioenergy sources is to access energy while saving greenhouse gas (GHG) emissions. However, if something has a large economic impact, it quite likely follows that it drives significant GHG emissions as well. The question is how big are these embedded emissions relative to the GHG emissions saved by substituting bioenergy for conventional electricity sources. To determine the GHG emissions involved in harvesting macroalgae for energy production we use Scottish sectoral emissions, thereby assuming that production sectors in the Western Isles have equal emissions intensities as equivalent sectors in Scotland on average. To attribute the emissions to economic activity we use a standard extended IO-model, following Leontief (1970), (see Wiedman et al. (2007), Miller & Blair (2009, ch. 10)). Total greenhouse gas generation in production is determined as:

$$(2) \quad g^x = \Omega^x x$$

where g^x is a $K \times 1$ vector, with elements g_k^x , where $k = 1, \dots, K$. Element g_k^x represents the total greenhouse gas of type k generated by the production activities in the economy. Ω^x is a $K \times N$ matrix where element $\omega_{k,i}$ is the average generation of emissions k per unit of gross output in sector i .

Then the standard Leontief model can be employed so that it is extended to

$$(3) \quad g^f = \Omega^x (1 - A)^{-1} f$$

where g^f is the vector of total generation of emissions directly or indirectly required to satisfy total final demand, f , in the economy

Final demanders (households) also directly generate emissions (for instance by combusting fuels and driving cars) and hence Eq. (3) is extended for final demand as

$$(4) \quad g^f = \Omega^x(1 - A)^{-1}f + \Omega^f f$$

where we distinguish the $K \times N$ matrix of emission coefficients for the N production sectors Ω^x from a $K \times Z$ matrix, Ω^y , where each $K \times 1$ column within has elements $\omega_{k,z}$ as the average direct use of resource k per unit of expenditure by final demand group z .

The greenhouse gas emissions are obtained from the Scottish National Accounts Project, which publishes data for 93 sectors up to the year 2006^{viii}. These are then aggregated to 25 production sectors (+households) to conform with the Western Isles economic accounts. Gross sectoral outputs (and household final demand) from an equivalently aggregated Scottish IO-table for 2006 are used to determine average emission intensities per £1 of output. This vector of emission intensities is then used to extend previous economic impact results. The results are reported in Table 2 below. This suggests that the emissions embodied in harvesting of macroalgae for electricity production, both directly and indirectly (type-I assumption), amounts to the equivalent of 1,464 tonnes of CO₂. Given the estimated electrical capacity of this amount of macroalgae, this would result in direct and indirect emissions equivalent to 0.17 kg of CO₂ per kWh.

Table 2 Energy capacity and greenhouse gas emissions driven by harvesting of macroalgae for electricity production.

Algae harvest	133,200
Price	20
Exogenous increase in sales of macroalgae	2,664,000
kWh electricity	8,559,432
cost per kWh	0.31
Emission in CO ₂ equivalent tonnes (Type-I)	1,464
% of ES total	0.18%
Emissions per kWh (CO ₂ equivalent kg)	0.17

This raises the question how effective this method of electricity production is at saving GHG emissions, which is of course contingent upon the emissions intensity of the displaced energy source. A benchmark is available from the Department for Environment Food and Rural Affairs (DEFRA), which publishes estimates for the average emissions intensities of electricity production in the UK, allowing for imports and exports of electricity^{ix}. Annex 3 reports the average emission intensity per kWh of generated energy in the UK. This reveals that in 2006 the average direct and indirect emissions required to produce a kWh of electricity in the UK amounted to 0.60kg, CO₂ equivalent (Table 3c, p. 13). Against this benchmark, per kWh of electricity produced via anaerobic digestion of macroalgae could save 0.43 kg of CO₂ equivalent greenhouse gas emissions.

There is some room to argue that this is a conservative estimate. In this calculation we are assuming marine bioelectricity displaces average electricity, whereas if it displacing fossil fuel generated electricity at the margin, this GHG saving could be significantly higher. Furthermore, if it is the case that locally produced electricity would displace imports from the grid, we could further factor in efficiency savings from avoiding losses in the grid. Moreover, anaerobic digestion can provide a combined electricity and heat source. We have not factored the latter energy output into our calculation. Its economic impact is likely to be less than from electricity, but still significant (for details see Lewis et al, 2011). However, given the simplifying assumptions that had to be adopted the margin of error in our analysis could be significant and therefore detailed interpretation of these findings is premature. First of all the harvesting sector does not exist and therefore we had to proxy its structure based on seafishing. Secondly, emission intensities are based on broad averages, rather than specific observations.

Conclusions

In this paper we analyse the potential economic and environmental impact of harvesting macroalgae and using this as input into anaerobic digestion to produce electricity. Although current estimates suggest this would be a relatively expensive energy source, it has potential supplementary benefits, such as greenhouse gas emissions saving and local economic impacts. We use the Western Isles as case study due to the availability of detailed economic accounts and the suitability of the isles for generating marine

based bioenergy. We briefly summarise the energy potential of this approach and find that although it would be minor in the context of the UK as a whole it could be significant in terms of a small community like the Western Isles, providing electricity sufficient to power about 20% of the homes there.

Given that electricity from macroalgae is unlikely to be viable as a stand-alone commercial venture, it is critical that other benefits compensate for the relatively high price required. Our results show that at the very least this approach can overcome two of the necessary hurdles, i.e. it contributes to local economic development as well as greenhouse gas reduction. The local employment impacts are significant, which ensures that the positive economic impacts are dissipated in the local community. Furthermore, despite initial worries that strong economic impacts could undermine GHG reduction (Hermannsson & Swales, 2013), our analysis shows that the emissions intensity per kWh of electricity produced from macroalgae is just over a quarter of the UK average.

As this analysis is based on a hypothetical sector and given inevitable lack of data various simplifying assumptions had to be adopted, we caution against an overly detailed interpretation of our findings. Our aim was to provide ball park figures given available information in order to aid decision making about devoting further resources to understanding the approach. The initial findings are positive. However, given the current state of knowledge, it is premature to conclude as further work is needed. In particular, a comprehensive and detailed social cost-benefit analysis, based on a thorough investigation of ecological, economic and social factors.

References

- Allan, G., McGregor, P. & Swales, K. (2011). "The Importance of Revenue Sharing for the Local Economic Impacts of a Renewable Energy Project: A Social Accounting Matrix Approach." *Regional Studies*. Vol. 45, No. 9, pp. 1171-1186.
- Armstrong, H. & Taylor, J. (2000). *Regional Economics and Policy*, 3rd edition., Oxford: Blackwell Publishers.
- Bird, KT (1986). *An historical perspective on economic and systems costs of kelp cultivation and for bioconversion to methane*. In Barclay WR, McIntosh RP (eds) *Algal biomass technologies: An interdisciplinary perspective*. J. Cramer, Berlin: 150-155.
- Bruton, T., Lyons, H., Lerat, Y. Stanley, M. and Rasmussen, M. B. (2009). *A review of the potential of marine algae as a source of biofuel in Ireland..* Retrieved from the World Wide Web: <http://www.seai.ie/Algaereport.pdf>
- Hermannsson, K. & Swales, K. (2012). *Energy from marine biomass: Potential and viability*. Strathclyde Discussion Paper in Economics (forthcoming).
- Hermannsson, K. & Swales, K. (2013). *How to determine the economic and social impacts of producing biogas from seaweed*. Article for *International Sustainable Energy Review* (forthcoming).
- Horn, S. J. (2000). *Bioenergy from brown seaweeds*. PhD Dissertation. Department of Biotechnology, Norwegian University of Science and Technology NTNU, Trondheim, Norway.
- Kelly, M. S. and Dworjany, S. (2008). *The potential of marine biomass for anaerobic biogas production: a feasibility study with recommendations for further research*. Scottish Association for Marine Science report. Retrieved from the World Wide Web: http://www.thecrownestate.co.uk/marine_biomass_anaerobic_biogas.pdf
- Learmonth, D., McGregor, P., Swales, J.K., Turner, K. & Yin, Y.P. (2007). *The importance of the regional/local dimension of sustainable development: An illustrative Computable General Equilibrium analysis of the Jersey economy*. *Economic Modelling*, vol. 24, no. 1, pp. 15-41.
- Leontief, W. (1970). *Environmental Repercussions and the Economic Structure: An Input-Output Approach*. *Review of Economics and Statistics*. Vol. 52, No. 3.
- Lewis, J.J., Salam, F., Slack, N., Winton, M. & Hobson, L. (2011). *Product Options for the Processing of Marine Macro Algae Summary Report*. The Centre for Process Innovation. Report commissioned by the Crown Estate. Retrieved from the World Wide Web: http://www.thecrownestate.co.uk/media/271433/products_from_marine_macro-algae_2011.pdf
- Loveridge, S. (2004). *A Typology and Assessment of Multi-sector Regional Economic Impact Models*. *Regional Studies*, vol. 38, no. 3, pp. 305 – 317.
- McGregor, P., Swales, K. & Yin, Y.P. (1996). *A long-run interpretation of regional input – output analysis*. *Journal of Regional Science*. Vol. 36, pp. 479-501.
- Miller, R.E. & Blair, P.D. (2009). *Input-Output Analysis: Foundations and Extensions*, 2nd edition. Cambridge: Cambridge University Press.
- Walker F.T. (1947a). *A seaweed survey of Scotland: Fucaceae*. *Proceedings of the Linnean Society London*. 159: 90-99.

Walker F. T. (1947b). *Sublittoral seaweed survey. Part I Development of the view box – spring grab technique for sublittoral weed survey. Part II, Survey of Orkney, Scapa. Flow Part III, Survey of Orkney, Bay of Firth. Journal of Ecology* 35:166-185

Walker F.T.(1954a). *Distribution of Laminareacea around Scotland. Journal du Conseil International pour l'exploration de la Mer* 20:160-166

Walker F.T., (1954b) *Distribution of Laminareacea around Scotland. Nature.* 173:766.

Wiedmann, T., Lenzen, M., Turner, K. & Barrett, J. (2007). *Examining the global environmental impact of regional consumption activities - part 2: Review of input-output models for the assessment of environmental impacts embodied in trade. Ecological Economics.* Vol. 61, No. 1, pp. 15-26.

ⁱ This work is part of the Biomara project, which is supported by INTERREG IVA; Highlands & Islands Enterprise; The Crown Estate; The Scottish Government; Department for Enterprise Trade & Investments, Northern Ireland; and the Department of Communications Energy and Natural Resources, the Republic of Ireland. For further details see: <http://www.biomara.org/>

ⁱⁱ For harvesting procedures Kelly & Dworjany (2008, p. 49) refer to Norway where algae are harvested for industrial use. As a rule of thumb a given patch can be harvested every 5th year, although this varies given the bio productivity of the waters.

ⁱⁱⁱ See Kelly & Dworjany (2008, p. 45).

^{iv} For additional activities this investment represents a sunk cost and therefore investment costs do not have to be covered until current capacity is exhausted and further investment needed.

^v For a further discussion of the viability of seaweed as an AD input we refer to Lewis et al (2011). In particular, Scenario 6 (p. 34) demonstrates commercial viability.

^{vi} This is the middle range of available estimates. Bruton et al (2009) reports an input cost of £240 per dry tonne of macroalgae. Horn (2000) reports based on Norwegian experience that seaweed harvesting costs are NOK 120 per wet tonne and then following Bird (1986) processing and cleaning costs are estimated at 50% of raw material costs. Based on historical exchange rates and UK inflation since 2000 this would imply an input cost tonne of wet seaweed of £18.7 per wet tonne or £187 per dry tonne.

^{vii} For a more detailed account see Armstrong & Taylor (2000), Loveridge (2004) and Miller & Blair (2009).

^{viii} For details see:

<http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/SNAP/expstats/EnvironmentalAccounts>

^{ix} <http://www.defra.gov.uk/publications/files/pb13625-emission-factor-methodology-paper-110905.pdf>

Bioenergy from Macroalgae: Some Costs and Benefits

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A significant drawback of many bioenergy sources is that energy crops displace alternative land use, such as for food. Responding to this criticism seaweed has been suggested as a source of next generation bioenergy. It is harvested and cultivated on a commercial scale in several countries in Europe (Norway, France), Asia (China, Japan) and South-America (Chile), but in most coastal areas it is relatively underexploited and therefore offers an appealing prospect: at least in principle.

Significant resources will not be devoted to the development and application of this potential energy source unless rigorous appraisal has suggested there may be positive social net benefits from its implementation. In this paper we seek to contribute to such appraisal by conducting a Cost Benefit Analysis (CBA). This is not complicated in principle, given that detailed information on how to conduct cost benefit analyses is widely available in textbooks. However, in practice, this raises some challenges. In particular, as the production sector does not exist any analysis is bound to be somewhat speculative as a result. Seaweed is harvested and cultivated for various uses around the World and various technologies are used to extract energy from biomass. However, these functions have (to the best of the authors' knowledge) yet to be combined. Recent surveys bring together a digest of publicly available knowledge on the subject (Bruford et al 2009, Kelly & Dworjanyan 2008, Lewis et al 2011). Hermannsson & Swales (2013a) summarise the potential energy capacity for the sector in Scotland and conduct an investment appraisal, while Hermannsson & Swales (2013b) estimate the local employment impact for a potential marine bioenergy plant in the Western Isles and its capacity to save carbon emissions. We shall draw on these and other sources to address what are the social costs and benefits associated with a hypothetical production of electricity from macroalgae in the Western Isles.

In practice, a new sector producing bioenergy from seaweed could emerge in a number of incarnations, depending on how the seaweed is sourced and what technology is used to convert it into energy. Here we assume that the feedstock is obtained from wild harvesting and draw on the wide range of information on the potential of such an operation provided in Kelly & Dworjanyan (2008). Furthermore, we assume that anaerobic digestion will be used to convert the seaweed into biogas and subsequently electricity. This draws on the findings of Lewis et al (2011) who conclude this processing technology is closest to commercial viability at the current state of technology.

The Western Isles, or Eilean Siar in Gaelic, is a council area in the Hebrides of the west coast of Scotland. In 2011 the community counted just over 26 thousand inhabitants residing on 14 islands. Due to a convergence of technical, natural and knowledge capabilities the community in the isles is uniquely situated to pioneer the use of seaweed for production of bioenergy. The islands are situated in waters that produce large quantities of seaweed (macroalgae) that is suitable as marine biomass for energy production. There is already an anaerobic digestion facility in operation in the islands that is used to dispose of household waste and produces both heat and bioenergy as its outputs. Furthermore, there is a wide range of know-how in existing marine-focussed sectors, such as fisheries and aquaculture, that can be drawn on in the development of an algae harvesting sector.

Of the seaweed habitats around the coast of Scotland approximately 1,000km² provide sufficient densities to be commercially harvestable. Approximately a fifth of these are around the Western Isles. Based on sustainable harvesting, seaweed could power more than 2,000 homes in the islands or just over a fifth of the homes in the community. The economic, social and environmental benefits of this are potentially significant.

Cost Benefit Analysis

Cost Benefit Analysis (CBA) is a policy appraisal tool frequently used for decision making, particularly on public policy issues. To this end public bodies maintain manuals on CBA and other appraisal tools, such as the UK Treasury's Green Book (with various supplements such as on GHG emissions and climate change) and the European Commission (Florio et al, 2008). CBA has its theoretical foundations in welfare economics and has been an active research field for several decades. CBA is the subject of several textbooks, for instance Layard & Glaister (1994). Hanley & Spash (1993) focusses on the application of CBA to environmental issues and provides a historical overview of the subject. CBA has been applied to a number of renewable energy cases (for an overview see Allan et al (2013)). A useful example to build on for this study is Moran & Sherrington (2007), which conducts a CBA analysis of a proposal for a large wind farm in Scotland's Clyde Valley.

The mechanics of Cost Benefit Analysis resemble those of simple investment appraisal (see Hermannsson & Swales (2013b)) in that it involves projecting a future stream of net-flows and discounting this to a base year value. This can then be used for decision making by first of all making sure that net benefits are greater than zero and furthermore for rival projects comparing net benefits to the identically calculated outcomes for other potential projects. Although sharing the same essential mechanics investment appraisal and CBA diverge in their scope. Whereas financial evaluation establishes a net present value based entirely on projected cash flows, CBA seeks to establish a net project value by summing a discounted series of projected net benefits. That is to say, the market value of benefits and costs are used when available, but for non-pecuniary items a range of methods are used to estimate monetary equivalent values for comparison on equal footing. In short, where monetary estimates are available for all relevant costs and benefits the Net Project Value (NPV) can be calculated as:

$$NPV = \sum_{t=1}^N \frac{B_t - C_t}{(1+r)^t}$$

Where B_t and C_t are the monetary value of benefits and costs at time t , respectively, N is the number of periods and r is the discount rate.

Scenario + Capacity

Hermannsson & Swales (2013a) estimate the energy potential and review the financial viability of using wild harvested seaweed as input for anaerobic digestion for energy production in the UK. Hermannsson & Swales (2013b) build on this analysis to explore the economic and emissions impact of establishing a harvesting operation for AD in the Western Islands. In this section we draw on these studies to outline a simple scenario for a cost benefit analysis of a hypothetical project where seaweed would be harvested as feedstock for anaerobic digestion in the Western Isles of Scotland.

1.1 Energy from marine biomass in the Western Isles

Macroalgae, or seaweed as it is more commonly known, is harvested wild or cultivated for various uses around the World. Around the British Isles seaweed has been put to various uses at different times, depending on availability and price of substitutes. Following the Second World War, resource scarcities stimulated comprehensive survey work of the extent and nature of seaweed forests around the coasts of Great Britain (Walker 1947ab, 1954ab). Recently, this interest has been revived as seaweed is seen as a potentially bountiful source of biomass for energy production. This has sparked research activity, which is summarised in several recent publications. Kelly & Dworanjin (2008) review evidence on the extent of harvestable macroalgae off the UK coasts and explore the potential for using it as a feedstock for producing bioogas via anaerobic digestion. Bruton et al (2009) examine the potential of marine algae as a source of biofuel in Ireland and Lewis et al (2011) review and compare options for the commercial utilisation of macroalgae in the UK. Hermannsson and Swales (2013a) draw on available evidence to estimate the energy potential from sustainable harvesting of wild seaweed in UK waters and examine the feasibility of harvesting seaweed off the Western Isles for local bioenergy production.

An anaerobic digester is a facility where organic matter (e.g. household waste, farm waste, and bio crops) is decomposed to form biogas (a mixture of methane, CO₂ and other gases) that can be used for electricity generation, heating or input into further processing. The Western Isles council has already invested in an AD facility for refuse disposal as landfill options are severely limited by the isles' geography. With this investment already in place the Western Isles are ideally placed to pilot the anaerobic digestion of seaweed on a commercial scale.

Surveying available evidence Kelly & Dworjanyn (2008) conclude that in UK waters there are approximately 1,000km² of habitat where seaweed can be found in sufficient densities to be harvestable. If we focus exclusively on the Western Isles, the macro algae estimated to be harvestable there is approximately 18% of the total in UK waters (Kelly & Dworjanyn, 2008, Table 4.1, p. 48) or 180km².

Given available information we can estimate the potential sustainable harvest of seaweed around the Western Isles. We have 180 km² of seaweed forests in harvestable densities. Each plot can be harvested on average every 5th yearⁱⁱ so that every year we can expect to harvest from 36km² of water. As every m² will yield 3.7 kg, each km² will yield 3,700 tonnes (3.7kg x 1,000m² /1000). Hence for 36km² we can expect an annual harvest of about 133,200 tonnesⁱⁱⁱ.

Hermannsson & Swales (2012) draw on information from Kelly & Dworjanyn (2008, Table 5.3, p. 73) to deduce the energy yield per tonne of seaweed. If the seaweed is anaerobically digested to produce biogas, which in turn is used to generate electricity each wet tonne of seaweed can be used to produce 64.26 kWh of electricity

Based on our previous estimates of potential wild harvest our annual energy yield could therefore equal 133,200t x 64.26 kWh/t = 8,559,432 kWh/yr. To put this into context OFGEM reports that an average home consumes 3,300kWh of electricity per year and therefore the Western Isles seaweed harvest could potentially support the electricity consumption of 2,594 homes. According to the General Registrar for Scotland there were 12,208 households in the Western Isles in 2011. Therefore, seaweed could potentially provide electricity for 21.3% of households in the isles. This locally produced energy could be used to substitute imports of energy to the islands or exported to the UK grid. In either case, it is a significant boost to the local economy.

1.2 Assumptions

To carry out the cost benefit analysis a scenario is defined based on a set of basic assumptions:

- We assume anaerobic digestion (AD) will be used to produce electricity and heat in a combined facility in the Western Isles
- The feedstock will be obtained from wild harvesting
- We assume this will require no new investment due to the presence of an existing AD-facility (with available spare capacity) and use of existing capital in the fisheries sector for harvesting.
- We apply a mid-range of estimates for market price of inputted seaweed (£200). See Hermannsson & Swales (2013a). This represents the cost of harvesting the seaweed.
- We assume a 3.5% discount rate following the Green Book.
- We assume no operating cost of AD facility at the margin, as existing costs are covered by current refuse disposal operation.
- Furthermore, operating costs occur only in harvesting sector and we assume these are fully covered by the input price of £200 per dry tonne (or £20 per wet tonne).

Estimating the costs and benefits

A range of potential private and social benefits of the project are identified below along with their likely sign in Table 1 below. We shall discuss each of these in turn.

Table 3 Private and social impacts identified for Cost Benefit Analysis

Private impacts	Social impacts
Market income (+)	Subsidy (-)
Subsidy (+)	Avoided emissions (+)
Investment (-)	Ecological impacts (-)
Operating costs (-)	Local employment (+)
	Green credentials (+)

The private impacts include the earnings of the project from selling energy in the market and the FIT and RHI subsidies received for providing green energy. The negative private impacts include the required initial outlays (assumed to be zero) and the operating costs over the project's lifetime. On the social impact side we deduct the subsidies provided, in order to avoid double counting and instead add back an estimate for the value of avoided GHG emissions. For this estimate we follow the approach of Moran & Sherrington (2007), by applying estimates commissioned by HM treasury (Clarkson & Deys, 2002) for the cost of climate change attributable to each tonne of CO₂ equivalent GHG emissions. A GDP deflator is used to convert these to 2012 prices. This figure is subject to significant uncertainty and hence a range of estimates is used. These estimates increase by approximately £1 in each subsequent year to reflect increasing damage costs over time. The inflation adjusted base year values are reported in Table 2 below.

Table 4 Damage cost of carbon per tonne of carbon (C) and carbon dioxide (CO₂) in 2002 and 2012 £ prices (own calculations based on Clarkson & Deys, 2002; Moram & Sherrington, 2007).

	2002		2012	
	C	CO ₂	C	CO ₂
Low	35	9.5	45	12.1
Medium	70	19.1	89	24.3
High	140	38.1	178	48.5

1.3 Private and social net benefits

Our starting point for estimating the social net benefits of the project is the private investment appraisal conducted by Hermannsson & Swales (2013a, Table 2). The details of this scenario are reported in Table 3 below. As we noted earlier this scenario builds on the favourable (but plausible in this case) assumption that there is an AD facility in place and hence there are no investment or running costs incurred at the margin. However, the AD facility pays a market price to the harvesting sector, which drives its annual operating costs. As we can see, based on these assumptions the operation is close to breaking even and would require an additional subsidy of just under £15,000 per annum to sustain itself.

Moving beyond the potential of bioenergy from macroalgae as a standalone commercial venture we want to add to this calculation the present value of the costs and benefits of various non-pecuniary items, which are realised indirectly as a result of the enterprise.

As summarised in Table 1 there are a number of channels for which social impacts can occur, some positive and other negative. Here we assess the viability of the project when correcting for the double counting of subsidies and estimating a value for carbon saving. The results of this analysis as presented in Table 4 below. As we can see from this simple analysis, the project is not likely to provide a positive net social benefit and therefore should not be undertaken based on this criteria. However, there are a number of additional issues that need to be taken into account.

Table 5 Investment appraisal for the anaerobic digestion of harvested seaweed.

Market input price, no investment or operating cost	
AD Input	
Macro algae (kt (wet)/a)	25
Food waste (kt/a)	0
Expenditures	
Seaweed price (GBP dry tonne)	£200
Annual fixed operating costs	£0
Seaweed input cost	£500,000
Total expenditures	£500,000
Income	
Electricity (GBP)	£350,406
Heat (GBP)	£109,936
Fertiliser (GBP)	£25,000
Total income	£485,342
Annual free cash flow	-£14,658
Other assumptions	
WACC	3.5%
Project duration (n)	30
Investment (GBP)	£0
Estimated project outcome	
NPV (GBP)	£269,591

Table 6 Net Project Benefit of AD based bioenergy from macroalgae based on a range of values for the social prices of avoided Greenhouse Gas Emissions (£).

		Low	Medium	High
Private impacts				
Market income	+	3,363,741	3,363,741	3,363,741
Subsidy	+	5,562,691	5,562,691	5,562,691
Investment	-	0	0	0
Operating costs	-	-9,196,023	-9,196,023	-9,196,023
Net private impacts		-269,591	-269,591	-269,591
Social Impact				
Subsidy	-	-5,562,691	-5,562,691	-5,562,691
Avoided emissions	+	1,958,158	2,882,183	4,730,232
Net project benefit		-3,874,124	-2,950,099	-1,102,050

First of all we have not taken into account ecological impacts, which are beyond the scope of this study to analyse. Although it is difficult to make a judgement a priori, ecological impacts could be significant and could feed back into other livelihoods on the islands, such as collection of drift cast seaweeds. In any case

harvesting is unlikely to proceed without first undergoing a thorough environmental impact assessment. Conversely, if a significant share of the community's energy needs were met by locally produced bioenergy this could enhance a perception of the Western Isles' environmental credentials. Although somewhat speculative, the possibility cannot be excluded that local export sectors could use that to their advantage, such as in marketing differentiation.

1.4 Employment impacts

An appealing aspect of this project, especially from the point of view of the local economy is its potential economic development impacts. These are analysed in Hermannsson & Swales (2013a). Although analysing a larger project, if their results are scaled down to conform to the assumptions underlying this analysis, the project could provide additional employment of 19 FTEs or 0.2% of total employment on the islands. Of course there are caveats that would need to be delved into further, such as potential employment crowding out. It would be useful to incorporate this development impact into the CBA. Scotland's island communities have struggled with depopulation like other peripheral communities for a long time. Maintaining these communities is therefore likely to have a positive value in the objective function of Scottish and UK governments. Furthermore, there is pressure on fisheries policies to come up with replacement jobs to meet fleet downsizing and therefore it is not inconceivable that such a project would be seen in favourable light at the EU-level. However, there are no widely accepted guidelines as how to value avoided depopulation in a CBA context and beyond the scope of this project to conduct research specifically on that methodological issue.

In the UK, however, there is a tradition of evaluating regional development assistance in terms of exchequer cost per job (see Swales 1992, 2005 for details). A simple approach would be to calculate this as the present value of the additional annual subsidy needed for the project to be viable as a standalone commercial entity and divide through with the number of FTE jobs attributed to the project. This would amount to £269,591/19=£14,189. A one off payment of approximately £14,000 per FTE job is likely to be considered a relatively low cost per job. Recently the National Audit Office calculated that the average cost per job for the English Regional Growth Fund amounted to £33,000^{iv}

Conclusions

This paper carries out a simple Cost Benefit Analysis for a potential new bioenergy production where wild seaweed is harvested and used as feedstock for anaerobic digestion, producing both heat and electricity. We formulate our scenario based on the assumption that this would take place in the Scottish Western Isles, which are a favourable location for such a development. In particular the existence of an AD facility in the isles permits us to assume that such a project could be undertaken without having to incur additional investment or additional fixed operating costs. However, we assume that the project has to bear a full market cost for its inputted feedstock.

Under these assumptions the project is not economically viable as a standalone commercial venture, but it is also not far from breaking even. Allowing for social benefits through avoided Greenhouse Gas Emissions the project becomes less viable. That is to say, our estimates of the social value of avoided emissions are lower than the subsidies available to the operation (which are counted as part of the commercial analysis). However, the project drives significant local employment impacts and compares very favourably with other regional development initiatives in terms of costs per job.

In brief, our analysis suggests harvesting macroalgae for energy production is neither commercially feasible nor a cost effective way of avoiding greenhouse gas emissions. However, it could be a very cost effective way of diversifying and expanding the economy of peripheral region, with the side benefit of reducing GHG emissions.

These results should be regarded as tentative, and providing a justification for scrutinising such projects further, rather than a justification for implementing them, which would be premature. Various simplifying assumptions had to be adopted. Furthermore, there are potentially significant costs and benefits that this study was unable to quantify.

References

- Allan, G., Gilmartin, M., McGregor, P. & Swales, K. (2013). *An Illustrative Cost-Benefit Analysis of Marine Electricity Generation in Scotland. Strathclyde Discussion Papers in Economics (forthcoming)*.
- Bruton, T., Lyons, H., Lerat, Y. Stanley, M. and Rasmussen, M. B. (2009). *A review of the potential of marine algae as a source of biofuel in Ireland.. Retrieved from the World Wide Web: <http://www.seai.ie/Algaereport.pdf>*
- Clarkson, R. & Deys, K. (2002). *Estimating the Social Cost of Carbon Emissions. Government Economic Service Working Paper 140.*
- Hanley, N. & Spash, C.L. (1993). *Cost-Benefit Analysis and the Environment. Cheltenham: Edward Elgar.*
- Hermannsson, K. & Swales, K. (2013a). *Financial viability of energy from biomass: Re-examination of the evidence. International Journal of Ambient Energy (forthcoming)*
- Hermannsson, K. & Swales, K. (2013b). *Economic impact of producing bioenergy from seaweed. Fraser Economic Commentary (forthcoming).*
- Kelly, M. S. and Dworjanyn, S. (2008). *The potential of marine biomass for anaerobic biogas production: a feasibility study with recommendations for further research. Scottish Association for Marine Science report. Retrieved from the World Wide Web: http://www.thecrownestate.co.uk/marine_biomass_anaerobic_biogas.pdf*
- Layard, R. & Glaister, S. (eds.) (1994). *Cost Benefit Analysis. Cambridge: The Press Syndicate of the University of Cambridge.*
- Lewis, J.J., Salam, F., Slack, N., Winton, M. & Hobson, L. (2011). *Product Options for the Processing of Marine Macro Algae Summary Report. The Centre for Process Innovation. Report commissioned by the Crown Estate. Retrieved from the World Wide Web: http://www.thecrownestate.co.uk/media/271433/products_from_marine_macro-algae_2011.pdf*
- Moran, D. & Sherrington, C. (2007). *An Economic Assessment of Windfarm Power Generation in Scotland including Externalities. Energy Policy. Vol. 35, pp. 2811-2825.*
- Walker F.T. (1947a). *A seaweed survey of Scotland: Fucaceae. Proceedings of the Linnean Society London. 159: 90-99.*
- Walker F. T. (1947b). *Sublittoral seaweed survey. Part I Development of the view box – spring grab technique for sublittoral weed survey. Part II, Survey of Orkney, Scapa. Flow Part III, Survey of Orkney, Bay of Firth. Journal of Ecology 35:166-185*
- Walker F.T.(1954a). *Distribution of Laminareacea around Scotland. Journal du Conseil International pour l'exploration de la Mer 20:160-166*
- Walker F.T., (1954b) *Distribution of Laminareacea around Scotland. Nature. 173:766*

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ⁱⁱ For harvesting procedures Kelly & Dworanjyn (2008, p. 49) refer to Norway where algae are harvested for industrial use. As a rule of thumb a given patch can be harvested every 5th year, although this varies given the bio productivity of the waters.

ⁱⁱⁱ See Kelly & Dworanjyn (2008, p. 45).

^{iv} For details see: <http://www.bbc.co.uk/news/uk-politics-18024447>

Living in the ruins or buried alive?

Conditions for sustainable development in former single industry communities

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My field is former single industry communities in the region of Gävleborg, Sweden, focusing on Norrsundet, Ljusne and Hofors. They can be defined as single industry communities in the sense that they were built as a consequence of establishing industries, and one industry was usually larger, and/or subordinating others.ⁱ Another characteristic is that they were built to be modern, or actually urban, and thereby tends to lack the charm sought for in agricultural villages. A society who used to be modern is seldom depicted as picturesque and appealing to visitors. In comparison with Iceland I guess the counterpart is fishing villages, with existing or former fishing industry in a rather large scale.

This large scale is also characteristic of the communities in Gävleborg and in many parts of the Swedish countryside as well, more obvious in the northern and inner parts of the country. The modernization and following urbanization, industrialization and so on, in Sweden occurred in two steps, first centralizing in these kinds of communities, then concentrating in larger cities. The smaller communities (*centralorter*) are now oversized in a very obvious way, due to severe depopulation and withdrawal of company service, welfare service and retail. This oversizing is not only visible concerning industry buildings, plants and so on, but also in the size of meeting places like community houses, sports arenas and a dramatic decrease of shops and cafés.

My interest in these small, post-industrial places started when I discovered that these kinds of communities didn't pay any attention to possibilities offered in subsidies for rural development, in opposite of other, more agrarian villages. I was evaluating a project on rural development in Söderhamns kommun, one of the municipalities in the region. Project leaders and others explained to me that it was no wonder; the inhabitants were described as passive, waiting for The Company to help them. The blame was put on them and a certain mythology of "bruksandan" was reproduced in the blaming, as an opposite of the officially preferred esteem or mentality: entrepreneurship. "Bruksandan" can be translated as "the spirit of industrial communities" and is generally described as a consequence of the Company as paternalistic structure, with no individual responsibilities. The "bruksanda" in this sense is characterized by conformity, passivity and lack of initiative, and could in a way be used as a fix explanation for the reasons of negative or lacking development.ⁱⁱ I found this mythology highly repressive and counterproductive. It also became obvious that it was also highly political, but very implicit, never spelled out.ⁱⁱⁱ

How? Method

At a very early stage, as I mentioned above, I was involved in these communities by doing evaluation of a rural development project.^{iv} As I live and worked nearby, the involvement became long-term. I was invited in different groups, started to participate in meetings, primarily in Ljusne. As a consequence of this, I started working with a pre-study about the cultural heritage after industrial society there, and cooperated with the local museum in this matter. Then I started to work in the research project "When reality doesn't correspond to the map - social and cultural conditions for sustainable development in rural areas"^v, and the number of people and meetings increased. Later on it led to additional funding for development projects in the cultural sector, now we have three of those running (on contemporary art and the cultural heritage of industrial society; on photography and documentation; on community theater).

At the small research unit I was working from, there had been a strong emphasis on what is called *interactive research*, which in my case included:

- Research circles
- Interviews, photography
- Field notes from participatory participation^{vi}
- Feedback and readings

- Repetition and recognition
- Co-thinking and co-writing

To some extent I have also used media, but the important core in interactive research is dialogue, feedback and letting people in to the research process instead of just studying them.^{vii}

What? Cultural sustainability

The overall frame for this project is sustainability. As several researchers already noticed, sustainability is a slippery concept and it can be questioned whether it is possible to use as a scientific concept at all.^{viii} Empirically, our aim has been to say something about conditions for *social* sustainability, first and foremost, but trying to connect to the other “pillars” of sustainability as well (economical and ecological sustainability). I have recently become aware of the use of the concept *cultural sustainability* as well, introduced to me by scholars from Finland and Iceland. Katriina Soini, at the university of Jyväskylä, is suggesting two ways of using cultural sustainability: either as a forth “pillar” or as a prism, a looking glass through which the other pillars or aspects of sustainability should be regarded. Since we’ve been looking for the cultural and social conditions for sustainability, this idea of a prism seemed most useful. This means the insight of sustainable development as regulated by norms, common understandings of the “nature” of things. This common understanding is continuously changing in time and space. Nevertheless, I have found it useful to use these *cultural processes* as a kind of point of departure. Cultural processes are not arising out of the blue, they are dependent on (at least) two important measures: experience and value, which in turn (and here oversimplified) rests on notions of class, gender, ethnicity or other local ways of producing and reproducing social differentiation.^{ix}

The question is, for a start, how does these regulations take place? On what grounds? Or: what are these cultural regulations concerning former single industry communities? This question is divided into two lines of discussion:

1. How does the distribution or production of *value* occur today, in the divide between centre and periphery, and to what consequences?
2. What is the potential – and threats - for a sustainable development in these communities, if we consider (historical) *experience*? What happens if we recognize experience-based stories of a place?

Part I: The distribution of value today Colonial traits; centre/periphery and mapping

Former single industry communities are mostly defined as belonging to the periphery. The bare little word “former” indicates this, and the failure to identify the place as rural hasn’t changed the fact that numerically speaking they are equivalents. Being built as modern or urban doesn’t help in this sense, on the contrary, there is nothing more un-modern than being ex-modern. Defined against the “new” urban, these communities are definitely inscribed as peripheral. In fact, it is possible to talk of *internal orientalism*^x here, since the relation is uneven and often pronounced in terms of dichotomies between “us” and “them”, in the well-known dichotomy of nature/culture, used to exert power:

• Nature	Culture
• Civilization	Barbarism
• Sense	Sensibility
• Male	Female
• Future	Past
• Development	Stagnation

It is a kind of colonial relation, the flow of resources and the distribution of value is not equal. Another colonial practice used in the creation of peripherality is *mapping*. The art of describing and mapping is a part of western modernization; by these practices it is possible to gain control over the uncontrolled, and to utilize it for different means.^{xi} It is necessary, I would like to add, to relativize the *localization* of peripheral places. The processes defining these have not only to do with geography. Places far out in the outskirts of Sweden, like Åre, Visby and Österlen, can be centre under certain times of the year: leisure times. Processes making centre and periphery is thus depending on both space and time.^{xii} Let me take three examples of mapping, which has consequences for the outcome of sustainable development:

1. Wind power plants (ecological dimension of sustainable development)

Large areas of wind power plants are currently planned in remote areas of Sweden. This has caused a storm of protests among individuals living nearby, or having any kind of interest in the area, both summer guests and farmers alike. Arguments like loud noise, destroying bird's wild life or inability for tourism to establish are communicated, but beneath all this is a strong sense of place. From the mapping point of view, places might seem abandoned, but very seldom are. Furthermore, studies in England reveal that it is areas appreciated for their openness that tends to be mapped as suitable for wind power plants.^{xiii} The consequences on nature and society seems to be recovered by a small "development subsidy", but often the community (and the amount!) is too small to be able to use it strategically. By mapping areas without getting local support and without being informed by local knowledge of places suitable/not suitable for wind power plants, is therefore not a suitable praxis for sustainable development from a social/cultural perspective.

2. Entrepreneurship (economic dimension of sustainable development)

A very common way to define development and exclude stagnation is the strong ideal of entrepreneurship. But being an entrepreneur is not always rewarded in former single industry communities, where being on "the wrong side" of employment can have far going consequence. As I mentioned above, this discourse is repeated in different levels of society, describing the inhabitants as passive and stubborn, suffering from "Bruksanda": a kind of mentality implicating backwardness and passivity. So the recipe for economical sustainable development doesn't work very well here either, leaving inhabitants in former single industry-communities with a strong feeling of failure.

3: Art projects. (social/cultural^{xiv} dimension of sustainable development)

In the empty buildings left by industry, art or handicraft often moves in. I dare to say that this is so common that it can be considered as a way of mapping. The concept is to transform buildings for construction into creative spaces, with little or no consideration of the cultural heritage of these buildings but merely a certain kind of aesthetics connected to abandoned industrial places. In Sweden we have examples from Avesta, in a rather large scale, or Fengefors, in a smaller context. The ambition is to get national and international attention, the local is merely used as a background and milieu. People already living there are either "hard to handle" or merely overlooked/bypassed.^{xv} What actually happened in a small community like Fengefors was a complete redefinition of place, turning into an arts and artisans collective with necessary support and service from the one's already living there. It was a kind of giant gentrification process, which, due to the scale, resulted in an impact of the community as a whole. This re-definition of place is interesting for our purpose: to look for the cultural regulations of sustainability. How is it redefined?

Re-defining place

How can peripheral communities get re-defined by the centre? How and why, and what implications or consequences do we get from this, concerning sustainability?

1. *Re-creating and overlooking the local.* The local, in a very wide sense of the term, is conspicuously put *out of* place. That is, it is common to re-create and interpret the local: taking up parts from it, making new usage of them. Earlier functions of items are transformed into symbolic and aesthetic values. The owner of these new values never belongs to the local him or herself.^{xvi} An example from one of the cultural project I follow as evaluator: At an exhibition and a happening, a lamp and an armchair from the seventies, with a worn rug under it, were placed in a corner. It became a symbol and a silent ghost, taken from its original function and milieu, made into an aesthetic item or statement. A second example: Mural painting took place in a central housing area, taking inspiration in motives from industrial heritage, without the kind of "Soviet" aura connected to these symbols in earlier pieces like sculptures. Taking bits and pieces, putting them together in a new context, made them symbols, but as such possible identifications or reverse. In the same project, and similar ones in Sweden, the local is not counted for anything. Rather it is used as capital in the battle for national attention or rather international. Ambitions are always stretched beyond the local level. The local is *by itself* contaminated and cannot be used as it is. This is a crucial part in undermining social sustainability that reveals the power relations between centre and periphery, even if it *may look like* being developing the local, it is more a question of colonization it.

2. There is also a time aspect in this re-definition of place, which implies making a *distance between history and today*, where "the locals" are seen as living in the past, and "the re-creating ones" being the future. This discourse is very strong. Re-defining place also demands keeping the line clear between subject and object, in which one is to transform the other. It is also necessary to create a difference between actor and audience, where the audience is to be created. The *function* of the audience^{xvii} can be described as follows.

The use of an audience in centre/periphery relations

1. Audience as servants

In this aspect of the use of an audience, the local (periphery) is expected to feed urban dreamers (centre), with:

- Cultural heritage
- Leisure
- Food
- Stability and roots

This is a crucial part in the modernization process, modernity being defined as urban, mobile and disconnected, but in need of history, roots, nature, tradition.^{xviii} It is the same pattern as in the colonial dichotomies above. In this aspect, the rural and/or periphery can be made visible only as “leisure-land”, recreation for inhabitants from the urban centre. The rural doesn’t exist during times without tourists, to put it on the edge. It is a place being visible only during specific times, under a specific gaze. *Being there out of time is being out of place.*

2. Audience as imitators

Another function of the audience in center/periphery relations is being imitators. The audience serves as a mirror of the actor, trying to imitate or please, thereby producing values, like:

- Attention
- Admiration
- Attempts

Homi K Bhabha has argued that the colonial object ideally tries to be “like us”, but never accomplish this striving, not quite.^{xix} There is always a “lag” of time; “café Latte hasn’t reached Jarvsö - yet”, and/or a “lag” of place: if someone appears to be just like “us”, he/she doesn’t belong here. In this case, the lag of place, it is a question of presumed *displacement*: you (who are one of us) shouldn’t be here (with them). Again, we see the principle of being out of place. I have now met three young ambitious women, in different contexts but living in the same region, who had been told that “you, who are so industrious, you shouldn’t be here”^{xx}

3. The audience as Confirmation

Most importantly, however, is the function of the audience as confirming or re-assuring. This third function is a kind of summing up the other two; by being servants, not quite like us but striving and admiring and thereby legitimizing, the hierarchy in centre/periphery relations is reproduced over and over. The audience/periphery serve as a definition and confirmation of the centre just in being its opposite.^{xxi} Also here there are several examples from colonial structures/studies; Edward Said among others, has described how the fantasy of the “East”, (what he calls Orientalism) serves as a definition or mirror of western civilizations.^{xxii} There is an evident need for descriptions of the periphery, or rather of peripherality, produced by journalists, photographers and to some extent researchers, spending a day or two in the periphery, writing black poetry of the abandoned land and then returning to the centre reassured. In literature this practice has given name to a genre, *country noir*, where the periphery serve as backdrop for all kinds of misery.^{xxiii} In photography a surge for modern ruins has created a certain aesthetics of abandoned places, especially these modern or post-modern in the literal sense of the word, places like plants, asylums, boardrooms and whole communities. It is a kind of “memento moris” or “vanitas” motives but the effect of these descriptions of a small community can be a feeling of being buried alive. Symptomatically, the photographer Jan Jörnmark describes these places as tombs.^{xxiv} Since the local in general is so detested, it is not hard to find this audience at namely every level in society, reproducing these myths. But there are also other voices, not so much heard because the lack of a frame or discourse to connect them to. I consider it an important act trying to produce such a frame, to put other stories in context, making them visible, recognizing them.

Part II: Potential production of value

The reactions of these myths and negative descriptions about the periphery can be reached when asking people living there, in the commentator fields of the local newspaper or in social media. The official channels of communication, the more narrow or traditional sphere of the public, has no room for other voices. So here I would like to introduce some of them

A comment on Mustafa Cans and Jan Jörnmarks article in the national newspaper Dagens Nyheter was: "Your playground is our history." The man writing this comment was irritated over what he described as "running in *our* buildings", *our* history, in words that treated the intruders as children. One of the inhabitants of Ljusne, a woman deeply engaged in politics for a long time and participant in my research circle, said that the descriptions hit her like a wet towel in the face, while trying to work for a future for the community of Ljusne. The same autumn, 2010, there were at least 3 articles in this genre, one exhibition and a couple of books.^{xxxv} Another member in the research circle said, about these articles: "The worst is that there is such a lack of expectations. Not anything about something new, coming, just describing the end of everything".^{xxxvi}

This has been a slow process for some time now. Several years before 2010, people I talked to in smaller communities seemed to be prepared for the question "why didn't you move?", sometimes answering it before getting the question.^{xxxvii} There is always some work required in coping with the fact that black descriptions need to be disarmed, otherwise the contamination of place can drown its inhabitants in shame. One young man in Hofors put it like this:

"it is inculcated that Hofors is a little "hole". It is both ourselves and the ones who don't live here that got that image of Hofors and I don't really know why /.../ The question is if it's not a thing becoming a truth in a way. But I'm not ashamed in any way coming from Hofors"^{xxxviii}

There are a lot of similarities in how the suburbs have been described in Sweden, a kind of genre that the ethnologist Per-Markku Ristilampi has called "black poetry".^{xxxix} This concept has gained more than one layer of meaning since this book was published; these suburbs have grown into a kind of ethnicity "blackness" more than anything.^{xxx} It has therefore become relevant to speak about the periphery, or rural, as "othered".^{xxxi} These descriptions are true *obstacles* for social sustainability, creating "underdogs" in the periphery. First and most obvious, it is a constant attack on the inhabitant's self-confidence and trust. If there is no trust, there can hardly be any social sustainability, as it is a key ingredient of the concept. On the other hand, the strong ties between people in peripheral areas are a *kind of trust* that is not recognized. And this is the second kind of obstacle I'm thinking of, the lack of recognition of resources in these communities.

Releasing other stories

One way of testing the potential production of value in former single industry communities could be to release other stories. There are multiple ways of doing this; interviewing, photographing, listening and giving attention on various occasions, or "story-telling nights". To ask and to let people speak is no rocket science. The hard part is listening without having the old stories in mind. It is important, I believe, to try to *unlearn* what we "know" first, and then try to listen with "fresh ears". This unlearning is a painful process and it takes time to find all the black boxes and open them one by one. It is also, by definition, very hard to make someone else understand this unlearning process, especially if you're the only one around trying. In fact, as Doreen Massey has argued, globalization rejects all other stories, leaving literally no space for them, in much the same way modernity did.^{xxxii}

However, supporting other stories, connected to a community, should not mean to "tie down" inhabitants to the local either.^{xxxiii} Rather it sets forward a striving to recognize the importance of place, without locking in the people who happens to live there right now. As the anthropologist Ann-Kristin Ekman has argued, a small community has important relations to persons who don't live there, a zone she has called the "shadow village".^{xxxiv} It is also important to acknowledge the global relations of inhabitants in these communities, because of the risk of otherwise defining them in another time and thereby in another space than us, according to the discussions of time-lag and displacement above. Having this in mind, a few ways of exploring the potential for production of value could be:

1. Re-imagine a sense of place

In discussions of globalization and the vanishing point of place going with it, Massey has heavily criticized globalization for its denial of spatiality. This denial she describes in terms of hidden power structures, producing inequality and the type of stories about time-lag discussed above.^{xxxv} The "threat" of margins invading the centre has not become true, rather they are effectively excluded. In this I would like to stress that it is crucial not to make the local spatial, but to make the global spatial in localizing it.^{xxxvi} It is necessary to recognize the global in the local without reproducing Jörnmark-stories of death or tourist appealing stories of art centres, but in asking the inhabitants how they perceive and handle change. When asking, it is obvious that a core question is to support local memory. It has been argued that communities under high pressure have a more urgent need to remember, to look back in history, and this practice has also been declared not useful for development.^{xxxvii} In the municipality's striving to forget the history of the industrial society of Ljusne, approximately 15 years of potential development were lost. Denying history and putting the blame of lacking development directly on inhabitants, were rather contraproductive, since

the only definition of development was acting accordingly to the map (i. e entrepreneurship), a map which took no notice of cultural and social preconditions.

In the act of re-placing, memory is crucial. Re-membering is quite the opposite of producing and selling cultural heritage to others, which became clear after a few years with local historians in this area and similar communities (Ljusne, Marmaverken, Gällö etc). From the point of view of *remembering*, history can't be interesting for persons coming from another place; remembering is embedded in place. Hence, the local museum in Ljusne functions as a kind of common for remembering, at exhibitions and meetings of different kinds. This is quite different from the "map-view" of using the history of a(ny) place as an objectified cultural heritage of general interest.^{xxxviii} It is also something completely different than place branding, which also stretches away from identification (introvert) towards distilling discourse of a place into a narrow kit of "sellability" (säljbarhet). The two later examples are commodifications, the first serves as identificatory. This practice of remembering, however, can exclude newcomers, but since there is an impressive stock of local knowledge formally open by local museums and books, there is a theoretical chance to catch up.

2. Legitimation of local knowledge

Modernization and industrialization can be seen as processes re-defining knowledge, making knowledge a business for experts. One example is to transform the learning chain from one generation to another, into an education system, a process also known as professionalization. Other kinds of local knowledge (than the vocational kind) had managed to reproduce itself orally, for example knowledge of kinship or good stories. Lengthy discussions on who is related to who is actually actively creating local knowledge, in creating the social web needed for any society, and of course, needed for social sustainability. Lengthy discussions of trying to determine which year something happened, is also a kind of cooperative production of memory, crucial for social cohesion. These kinds of oral reproduction also consists of judgements, value, moral standpoints a s o, and it's possible to see the actual production of cultural processes as shared meaning, ever fluctuating. It could be strategic, due to this, to support the recapturing of local knowledge, for example by organizing "story telling nights". The research circle held one in Ljusne 2011, on the theme "bruksanda" (or "spirit of a former single industry community). On this occasion it became possible to make a local *redefinition* of the word, widening it's meaning to embrace positive experience of the concept, like cooperation and helpfulness, feeling safe and known, as well as the less pleasing ones of being constantly observed and commented. But it should be remembered that this in turn only was possible after a few stories told by the participants of our research circle, making space for a wider meaning. Releasing other stories is therefore to be seen as an act involving some kind of effort. The stories need to be reproduced in public, made common, to get useful. This public sphere has been considerably diminished after the industrialization era. Not only public meetingplaces has lost their meaning and being replaced by a few benches in the local mall, most important is the loss of work. The common workplace served as a public sphere where men and women could check if something or someone was trustworthy. One project leader in Norrsundet, another community I have been looking at, told me that after employment there was a lack of these kinds of "checking" opportunities, so that no one appeared at different events, since they didn't know if it was considered "ok" by others.^{xxxix} This lack of common places created a vacuum in the community.

3. Re-cognizing cooperation, mutual support, resistance

This need of a collective decision in different matters has been regarded as a burden in today's extremely individualistic society. It has become a hallmark of the contested "bruksanda" and as such regarded as being out of time. Häyrynen et al has proposed that former single industry societies oppressed diversity in the community, differences that nevertheless existed as a kind of hidden structure. After industrialization, this diversity is now revealed, creating or showing the deep lines of differences cutting across these communities.^{xi} I would say that the making of differences has, on the contrary, been an important part of the cultural processes of these communities, differences according to class and hierarchy first and foremost, but also differences of gender, ethnicity/origin. What has not been acknowledged, however, is the long term experience of social inclusion and cooperation *within* these different groups, and, especially concerning class, a long term experience of resistance. Even though some of these industrial communities was rather late in, for example, development of unions, there has been a long record of resistance in these matters.^{xii} Another kind of resistance was the use of the company as a common resource, in everything from constructing material, know-how and garages.^{xiii} This is a kind of hidden resource that hasn't been replaced, other than in different kinds of projects following the decline of the community. The art of finding resources is a skill in these communities, where getting by, or muddling through, is a necessity.^{xiiii} It is also a zone not easily revealed, according to the semi-criminal character of it, but nevertheless important and vivid.

Another resource connected to this “muddling through” business is mutual help. Rural Sweden (and I dare say other rural landscapes as well) wouldn’t survive a day without the social or moral economy, where getting help and supporting others are in constant circulation.¹ This also belongs to the sphere of the semi-criminal at times, and there is a fear in letting “the authorities” know about these transactions. Nevertheless they are absolutely crucial for surviving in peripheral areas.

On the other hand – the risk of falling into the trap of idealism

Now, where is the downside of this cohesiveness and mutual help? Of course, these kinds of socio-economic relations demands trust and inclusion, which in turn easily causes suspicion and exclusion towards others. Coming as a new inhabitant it is hard to get access to these activities, unless you got some needed resource or having a long line of respected family members behind you. Even this helpfulness has its limits depending on who you are, for example a migrant living in Ljusne told me that he once needed help starting his car with jumper cables, but his neighbour just looked at him and went away, not even answering to his question.²

Another danger in this way of organizing a society, where known and respected persons and events become important, tend to reproduce structures which are NOT so good for social sustainability, concerning for example gender relations and ethnicity issues. The persons being celebrated and regarded respectable is often (white) men. Ethnicity issues tends to be provoking in f ex Norrsundet, and a populist xenophobic political party has quickly made progress in Ljusne. It can be seen as a resistance of being more socially burdened; the “blackness” of the area getting deeper with refugee settlements, filling those empty houses that reminds of former glory.

Small communities have a basic need to put people in place. When a society has lost resources in service, jobs and population, it is very vulnerable. As in recognizing local memory, integration must include some kind of effort to make room. He mentions a former group of immigrants, a group from Bosnia in the nineties, who really made Ljusne blooming. A few of them still lives in the neighborhood. In contrast, the constant change of people in the refugee quarters, is harder to deal with. ³ Disturbing the inner rationale of the community, is risking social sustainability. Acting with respect towards the cultural and social conditions is necessary. The challenge is to include new groups in small communities, without unbalancing the importance of being known.

Conclusion

These two lines of analysis have led us to a rather short conclusion:

1. We need to analyze **the relation between centre and periphery today**, to reveal power relations by looking at the distribution of value.
2. We need to **acknowledge potentials and dangers** in (former single industry) communities by acknowledging the importance of place as built by social relations and memory.

This requires a bottom-up perspective and the use of unconventional sources over a long period, to understand the cultural conditions for sustainability in former single industry communities.

ⁱHäyrynen, Simo/Nyman, Jopi 2012: Introduction: Changing Single-Industry Communities as Examples of Identity Formation. In Häyrynen, Simo/Turunen, Risto/Nyman, Jopi (eds): *Locality, Memory, Reconstruction. The cultural challenges and possibilities of former single-industry communities*, p. 4-5. Cambridge Scholars, Newcastle upon Tyne.

ⁱⁱEkman, Ann-Kristin: *Kultur och utveckling i Bergslagen*, I Bergdahl, Ewa/Isacson, Maths/Mellander, Barbro: *Bruksandan – hinder eller möjlighet?* Ekomuseum Bergslagen 1997, s. 36.

ⁱⁱⁱ Ekman, Ann-Kristin 1996: *Från stålverk till Sevilapaviljong*. In: Ekman, A-K (red.): *Bortom bruksandan. Föreställningar om kultur, historia och utveckling i Bergslagen*, s. 108, 112. She also refers to Susan Wright (1992) who wrote on similar processes of partial forgetfulness in mining districts in England: *Heritage: A critical history in the reinvention of mining festivals in North-East England*, in Boissevain, Jeremy (ed): *Revitalizing European Rituals*. Routledge, London.

^{iv} Vallström as Andersson 2006: *Lyssnandets båda sidor. Utvärdering av landsbygdsprojektet i Söderhamn 2002-2006*. Report, Söderhamn.

^v Financed by FORMAS, The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning.

¹ Salazar, Carles 1996: *A Sentimental Economy. Commodity and community in rural Ireland*. Berghahn books, Providence; Andersson, Maria 2003: *Arbetslöshet och arbetsfrihet. Moral, makt och motstånd*. Diss Uppsala university; Isacson Maths 1994: *Vardagens ekonomi. Arbete och försörjning i en mellansvensk kommun under 1900-talet*. Gidlunds, Hedemora.

² Interview Narek, 2011.

³ Interview Lasse Persson 18/8 2010.

- ^{vi} And to a certain extent observation, but harder to keep the distance, needing to share my findings to be able to go on, and being observed as much as the opposite.
- ^{vii} Svensson, L (2005): An interactive approach and combined methods: Development of applied youth research. I: Helve, H (ed) (2005). *Mixed Methods in Youth Research*, s 252-273. Finland: Finnish Youth Research Network; Aagaard Nielsen, K & Svensson, L (2006): *Action and Interactive Research. Beyond practice and theory*. Maastricht: Shaker Verlag.
- ^{viii} McDonald, Allyson: *Zone of sustainability: dream or danger?* Paper delivered at PEMABO 2012 in Ísafjörður, Iceland: http://www.uwestfjords.is/pemabo_westfjords_conference_2012/slides/skra/569/
- ^{ix} Scott, Joan W 1992: "Experience". In: Butler, Judith/Scott, Joan W (eds): *Feminists theorize the political*. Routledge London/New York. Skeggs Beverly (1997) 2006: Att bli respektabel. Daidalos Göteborg; Skeggs/Wood, Helen 2012: *Reacting to reality television : performance, audience and value*. Routledge, London.
- ^x Jansson 2003, 2005, after Eriksson, Madelene 2010: "People in Stockholm are smarter than countryside folk" – Reproducing urban and rural imaginaries in film and life. In: *Journal of Rural studies* 26, p. 96, 100.
- ^{xi} Andersson, Maria 1996: Osynlige mannen. Om kön, makt och modernitet. In: *Nordnytt nr 65*.
- ^{xii} Massey, Doreen, 1994: *Space, Place and Gender*, Cambridge.
- ^{xiii} Munday, Max: Wind energy: *Might community benefit provisions grow community ownership of renewable energy resources in the Celtic periphery?* Presentation given at PEMABO 2012, Ísafjörður, Iceland: http://www.uwestfjords.is/pemabo_westfjords_conference_2012/slides/skra/569/
- ^{xiv} "Cultural" in the other sense of the term, namely as "fourth pillar".
- ^{xv} Study visit Avesta 2011-10-05, with the project "Art Power" and event in Ljusne 2012-03-02, same project.
- ^{xvi} Elíasdóttir, Albertína. „I own Ísafjörður and Ísafjörður owns me" Place attachment and place identity in Ísafjörður. Presentation at PEMABO 2012: http://www.uwestfjords.is/pemabo_westfjords_conference_2012/slides/skra/560/
- ^{xvii} I owe Beverly Skeggs for the concepts of audience and value, inspired by a lecture held in Uppsala 2012, but the question of the *function* of the audience is not what she is analyzing. I use the concept in a more symbolic way, the audience not in a literally spoken sense of the word, more like a position to be held.
- ^{xviii} Lindqvist, Mats 1992: Kapitalism och tradition. Om kulturell komplexitet och modernitet. In: *Kulturella perspektiv nr 2*.
- ^{xix} Bhabha e Eriksson, Catharina/ Eriksson Baaz, Maria/ Thörn, Håkan 2002: Den postkoloniala paradoxen, rasismen och "det mångkulturella samhället" In: (same eds.): *Globaliseringens kulturer. Den postkoloniala paradoxen, rasismen och det mångkulturella samhället*, p. 26.
- ^{xx} Living in Söderhamn, Los and Hofors. Industrious is, by itself, a repressive adjective, generally used about women.
- ^{xxi} Stenbacka, Susanne 2011: Othering the rural: About the construction of rural masculinities and the unspoken urban hegemonic ideal in Swedish media. In: *Journal of Rural Studies* 27, p. 243: Erikson 2010.
- ^{xxii} Said, Edward (1978) 1997: *Orientalism*. Ordfront, Stockholm.
- ^{xxiii} See, among others, Marklund, Anton 2011: *Djurvännar*; Nilsson, Ola 2010: *Hundarna* from a discussion in <http://omlinemagasin.se/2012/02/08/landsbygd-noir/> (2012-01-29). Recently, another genre of literature about the rural has emerged in Sweden, more nuanced: http://www.svd.se/kultur/litteratur/gehor-for-landsbygden_7866810.svd (2013-01-29).
- ^{xxiv} Jörnmark, Jan/Hausswloff, von, Annika 2011: *Avgrunden*. Tangent, Göteborg.
- ^{xxv} Mattson, Kristina 2010: *Landet utanför. Ett reportage om Sverige bortom storstaden*. Leopard förlag, Stockholm; Jörnmark/Hausswloff 2011: *Avgrunden*; Can, Mustafa, i SvD 2010-09-12: Kullberg, Dennis, i *Ica-kuriren nr 43 2010-10-25*, Exhibition Jens Assur, Bollnäs.
- ^{xxvi} Gunbritt Wallström, research circle 2010-11-04.
- ^{xxvii} Interview Pia Gustafsson (anon.), Gällö 2006. See sociologist Lotta Svenssons paper this volyme (?) about values regarding youth mobility.
- ^{xxviii} Interview Motbilder nr 2012-06-20, by Lennart Engström.
- ^{xxix} Ristilampi, Per Markku 1994: *Rosengård och den svarta poesin. En studie av modern annorlundahet*. Symposion, Stehag.
- ^{xxx} Ericsson, Urban 2007: *Belägrade människor, belägrade rum. Om invandrargöranden och förorter*. Diss. Uppsala university.
- ^{xxxi} Stenbacka s 239.
- ^{xxxii} Massey, Doreen 2005: *For space*. Sage publications, London. p.87:
- ^{xxxiii} Ibid p.86.
- ^{xxxiv} See Ekman, A.K. Beyond the village Exploring the Importance of Social Networks for Rural Development. Presentation given at PEMABO 2012: http://www.uwestfjords.is/pemabo_westfjords_conference_2012/slides/skra/581/
- ^{xxxv} Massey 2005, p.81-89.
- ^{xxxvi} For a good example of this, see Lindqvist, Mats 2009: Förändringshysteri. In Hagborg, Anna/Lennartsson, Rebecka/Vallström, Maria (eds): *Tidens termik. Hastighet och kulturell förändring*. Borea, Umeå.
- ^{xxxvii} See Allyson McDonald, this volume (?) about looking forward, forgetting, getting ahead.
- ^{xxxviii} Vallström, Mikael, 2006: *Det förflutnas närvaro. Essäer om norrländska kulturarv, historieskrivning och tidlig mångfald*. Forskningsrapport Riksantikvarieämbetet, Stockholm.
- ^{xxxix} Susanne Norén 2012-01-17.
- ^{xl} Häyrynen/Nyman p.5.
- ^{xli} Bengt-Göran Källman, 1999: *Fackföreningen vid Ala under 90 år*.
- ^{xlii} Research circle 2010-11-30.
- ^{xliii} Cf Tom Hall, paper on EASA 2002, Copenhagen.

We don't want you to join us if you don't leave us!

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In the transition between school and working life many young people are forced to make decisions which will have major, but difficult-to-foresee, consequences for their futures. For many of them there is an additional decision to make, namely the question of whether they should stay where they have grown up or move somewhere else.

There is a migration of young people from almost every small municipality in Sweden, which is a major concern at several levels of society. Municipal leaders see their population base shrink, and are worried about the change in demographics and how this will affect social welfare. Businesses are worried there will be a shortage of skilled labour. Furthermore, there is the issue of what happens to confidence in the future and opportunities for development in a community where the young people are leaving?

This article discusses the paradox in that underlying norms and internal logic lead to a situation where neither the young people who leave nor those who remain in the region are seen as a force for development. This is despite the fears of the adults in the regions of emigration, and despite there often being an expressed desire from regional policymakers to increase the participation of young people in regional development.

The leave/stay issue isn't new

Research about young people is often inter-disciplinary since youth is a concept which is interesting from several aspects. Migration research has also been carried out within different disciplines and the theoretical and methodological approaches vary. To sum up, it can be said that research into the causes of peoples' decision to migrate can be discerned as a development from theories that emphasize actual, primarily economic, relationships, towards a recognition of relational, social, and cultural factors (see e.g. Ravenstein 1985, Jackson 1986, Tilly 1990, Castles & Miller 2003). In my analysis of young peoples' leaving and staying I find the theoretical sources of inspiration primarily within sociology, cultural sociology, human geography, and gender studies. Within the individual disciplines, different factors are emphasized as essential, and my research approach is that the combination of explanatory factors have much to contribute to the analysis of the migrate/stay problem (Svensson 2006).

When Swedish young people have been studied (see for example Jonsson 1994, Trondman 2001, Johansson 2003) it becomes evident that beyond the underlying factors of class, gender and ethnicity there is also a local/regional aspect. In the question of whether to move or stay there is a clear dividing line between groups, where young people (with otherwise similar backgrounds) behave differently, depending on whether they live in larger cities or if they live in smaller communities.

Major transformations in small Swedish municipalities

I mainly base my study on the experiences and views of young people in Söderhamn, a municipality along the Swedish east coast, in approximately the middle of Sweden, about 270 kilometers north of Stockholm, but I have also made a comparative study in three municipalities in the south of Sweden (Svensson 2012). That study confirms the results from this former study.

Söderhamn can be described as a rather traditional industrial town, based on the forestry industry. The municipality consists of the central town (where around half of the population live) and the surrounding countryside, villages, and smaller industrial communities.

Söderhamn's population has decreased from more than 32,000 in 1975 to around 25 000 in 2012. Because of the industrial restructuring, that has taken place since the mid-70's, Söderhamn and similar municipalities have suffered from a declining population base and a relatively high level of unemployment.

During recent decades Söderhamn has lost several thousand jobs. A number of industries, including sawmills and paper and pulp industries, have closed. The conversion from an industrial society to a post-industrial era has seriously hurt Söderhamn, as in many other municipalities in Sweden. During the 1980's

this loss of employment was compensated to some extent by a major expansion in different areas of public enterprises. When the public sector declined during the early 1990's the crisis broke for municipalities like Söderhamn. The decision to close the F15 Air Force base was for that reason somewhat of a deathblow to the entire region. (SOU 1998:89: 3, my own translation)

In other words, the structure of opportunities has changed to a great degree in recent years and the structural changes in the labour market have drastically reduced the opportunities, for example, to find an industrial employment in Söderhamn. Söderhamn is in a period of transition, in an attempt to move on from its history as an industrial town and re-orient itself towards a "knowledge society".

The development of a region is not a rational forward-moving process with clear paths and goals, but rather something uncertain and in continuous creation. In a municipality like Söderhamn the involvement of the residents in the regional development is essential for what the future of the area will look like. In this context the attitudes of young people to the region have a great symbolic value. The decision of the individual young person to migrate or stay affects the local and regional society. Naturally, knowledge of what can influence people to stay in their home community or to migrate is also of importance for formulating regional policies.

An interactive approach and combined methods

From an interactive research approach, and a combination of several data collection methods, I have tried in different ways to involve myself in the everyday thoughts and actions of young people and adults, and in their reflections concerning themselves and others. Interactive research seeks to combine the demands of both relevance and scientific method, which includes creating a proximity to the reality where new groups are included in the formation of knowledge. What differentiates interactive research from other research is not which data collection methods are used, but rather the opportunity for a common formation of knowledge in equal dialog between the researcher and the participants (Aagard Nilsen & Svensson 2006).

Table 1. Different data collection methods used in the analysis and their contribution to my research

Data collection method	Analysis focus	Main contribution to my research
8 Interviews , 4 boys, 4 girls	Attitudes of individual young people	What do the young people themselves perceive to be important in the stay/move issue? What explanations are given/not given?
Project work in the upper-secondary school	Young peoples' group discussions, 50 pupils surveys other young people.	How do young people in groups discuss their own and others' attitudes to moving or staying? Is it more "correct" to think in a particular way?
60 Essays , upper secondary school	Young peoples' individual reasoning/priorities	Are there differences between different school classes, between genders within and between the groups? What arguments do the young people use regarding their decisions to stay or move?
Joint analysis with the essay-groups	Young peoples' group discussions	Is there peer pressure on this issue? If so, what form does it take? Is it different in different groups? Is there a hierarchy of "better" and "worse" points of view?
Survey (213persons =86% of all pupils in last year of upper secondary)	Survey of an entire year group in the upper-secondary school	Systematised knowledge on the young peoples' attitudes to the home town/big city and the move/stay issues are related to factors such as social background and gender.
Formalised meetings with adults	Adults' group discussion in more official contexts	Adults' official attitude to the various choices facing young people and their explanations of the different choices that young people make.
Informal discussions with adults (and young people)	Adults' views individually and in groups, in more informal contexts	Spontaneous, unconsidered, uncensored reactions and views have provided a range of insights into and knowledge on the everyday understanding of the move/stay problem
Youth conferences	Meeting between adults and young people	How are the wishes of young people and adults regarding the participation of young people met? Discrepancy between rhetoric and action provides clues to dilemmas and ambivalence. The researcher can fulfil a function by clarifying this.

I have studied the experiences and opinions of the young people at an individual level, in the form of interviews, essays, and questionnaires. The results from this data have been discussed and analyzed together with young people in different groupings. I have also studied several different contexts/situations where young peoples' migration/staying is processed in one or another way, by the young people themselves and/or by adults. During my research project I have both followed and taken part in the public discussion concerning young people in the region, and I have followed actions for the participation and influence of children and young people in the municipality (Svensson 2005).

The interactive approach and the various data collection methods I have used have in part addressed different questions and have varied in terms of the focus of the analysis. They have thus together contributed to the results of my research. In table 1, I relate different data collection methods to the primary analysis focus and to the method's main contribution to my research results.

To choose yourself?

The answer of young people to the question of what determines whether they migrate or remain is the self-evident comment "you decide yourself" or "you want such different things", and occasionally "the others don't understand what is best". Their own choices are presented as obvious and "natural" and the different behaviour of others can sometimes be explained by them possibly having been affected by friends and parents.

From the answers to the questionnaires, it is apparent however, that the young people to a great degree share basic values about what is important in life. From the young peoples' own experiences of differences it is perhaps surprising that there aren't greater differences. From the essays you can see that boys facing the future, as a rather homogenous group, focus on their coming work, but the path to get there is different for different groups. The focus of the girls is more diffuse. One group of girls - primarily those in vocational programs in upper secondary school - stress home, family and relationships in their future plans. Another group of girls, primarily those in more academic-oriented programs, focus on new experiences, travel and individual development.

How the young people see their own opportunities to achieve what they want in Söderhamn doesn't seem to be of decisive importance for whether they could imagine staying or migrating. Instead you can see an inverse relationship. It is a majority of middle class young people who see that most opportunities are open to them in Söderhamn, at the same time that it is individuals from this group who to a high degree say that they will leave.

Questions of participation and influence arose early during my research, and many young people complained about a lack of participation and influence when we spoke about the future. The perceptions of the young people on this issue ran counter to the "truth" asserted by many adults, that young people are not interested in local/regional development. The lack of agreement between the perceptions of adults and young people on this issue of course increased my interest in the question.

The questionnaire answers revealed that the *desire* to be able to influence your immediate surroundings is generally evenly shared by the different youth groups, but the young peoples' *belief in their opportunities* to influence differ to a great degree. Working class young people don't believe there is an opportunity to get more involved. They don't know where to turn or whether anyone would be interested in their participation. The boys are angry and frustrated by this, to a greater degree than the girls. The middle class young people have greater confidence in their opportunities to gain influence over societal development, at least when they get older, and if they are prepared to adapt to the political system. Middle class girls also express a hope that the opportunities for influence and participation can be greater somewhere else.

What do the adults think?

Broadly generalized you can say that the working class children have to a higher degree a desire to be able to stay in their home locality, or in its vicinity, and they also perceive this as their parents' wishes. At the same time, these young people say that both they and their parents see the situation realistically and that the foundation of an adult life is that you have a job and can support yourself. And if there aren't jobs in Söderhamn, then you have to look elsewhere, even if that is not what you want.

For the middle class young people the relationship is the opposite. Both they and their parents see future migration as something natural. It is often so obvious that it isn't even discussed specifically, but rather is an underlying given for other discussions. The question of migration for middle class young people often is related to the idea of a college or university education, but far from always. For these parents moving away also seems to have an intrinsic value.

Among the groups of closest friends, the choice seems to be obvious in the same way. You socialize with other young people who look at life and the future in about the same way that you do yourself. *What* the “natural thing” to do in the migrate/stay question is nevertheless different for different young people, on the basis of social background and gender. For that reason the perception of what you as a young person shall/should/wants to do about your future moving or staying differs.

One issue that revealed large differences based on the young peoples’ class backgrounds, was the feeling of being desired/in demand by the local policymakers. On the question of whether they think local politicians want them to remain in the municipality, almost 70 percent of young people with clear middle class backgrounds answered yes. Only around 30 percent of the working class young people answered that question positively.

Table 2. Do you believe that the local politicians want you to stay in Söderhamn?

Proportion (in percent) who answered yes. (Chi²: *=0.05, **=0.01)

	Boys:	Girls:
Working class	28**	31*
Weak middle class connection	40**	31*
Strong middle class connection	69**	67*

The paradox appears even clearer here. The middle class young people - the ones who see the most opportunities in Söderhamn, who feel the most wanted by local politicians and who believe they have the greatest opportunities to influence their situation - are also those who to a great degree are planning to leave the region. Many of them, however, can imagine returning later in life, if the right conditions should arise. The middle class boys, to a much greater degree than the girls, express a desire or will to return when it is time to start a family.

The working class young people - who don't feel wanted by the local politicians and who don't see any particularly great opportunities to influence - would, to a significantly larger degree, like to stay in the region. How can this be explained?

Choose yourself – but choose right!

My study shows that the formation of identity among young people develops in an interchange of several strong (and sometimes conflicting) mechanisms and it strongly confirms the importance of class and gender. (see e.g. Willis 1977, Skeggs 2000) The wishes and hopes of the young people are to a great degree linked to their social backgrounds, but there are differences between boys and girls within the same class.

Based on my study, I believe that different factors don't just add to each other, but rather that there are interactive effects among them which are of importance for the young peoples’ decision-making. Class and gender, as well as the tension between the centre and the periphery, are expressed in the region in different ways. This comes through the various young peoples’ divergent regional attachment; through the different expectations of boys and girls, that is, the regional “gender contract” (Åström & Hirdman 1992), through the different conceptions of normalcy which this gives young people; as well as through the different opportunities for both real choices and for the preferential right of interpretation offered different young people. The relative importance of the different factors have been negotiated and confirmed primarily among the circle of friends and family. All of these factors interact and influence the individual's opportunities for development, values, and horizon of opportunities.

Even if the young people themselves don't expressly identify with their home municipality, I have seen major differences in how rooted young people can be there, above all based on their desires for proximity to family and friends, and in their hopes for the future. In my study, as in others (see for Swedish examples Jonsson 1994, Trondman 2001, Johansson 2003), it becomes clear that the living conditions of working class young people provide them with a base in the home community, while the middle class young people to a greater degree have their sights on “moving on”. They look to the world to find “something more” and “something better”. This difference in attachment to the region is also reflected in which questions interest different groups of young people. The working class young people express a desire to devote time and

interest into more local practical issues, while the middle class young people have a more global and ideological interest in society.

The traditional “gender contract” prevalent in the area results in the expected consequences, where the social rules do not represent a marked problem for the boys. The middle class boys are strongly confident that they will be able to participate in and influence regional social development, at least if/when they return as adults. That is after they have shown that they know where a modern youthful life ought to be lived. The stumbling block for middle class boys is largely “only” the difficulty in finding a sufficiently good job in the region.

For the middle class girls, based on the conclusions they draw from growing up and their expectations for the future, it isn’t as probable that they can achieve what they want in the region. Even if they, as a group, to a relatively large degree believe that the local politicians want them to stay in the municipality, they seem to be sceptical of their opportunities to participate in the regional development. This group of girls places high demands on themselves and on their surroundings. They don’t intend to be satisfied with just anything, but are rather hunting for “the best life”, and they intend to optimize their opportunities to achieve it. The regional “gender contract” is a probable reason for them seeing their lives as far too restricted in their home municipality. They believe there is a lot that has to be changed in the municipality before life there would be optimal, and for that reason many come to the conclusion that their future is not in Söderhamn.

The horizon of opportunity for the working class young people is characterized to a high degree by limited hopes. If you generalize perhaps you can say that they don’t dream of “everything”, but rather hope in any case to get “something”. For the boys, work is an important component which to a great degree determines other priorities, but their attachment to the region is strong and their hopes to be able to stay in the region are clearly expressed. Many of them don’t see that they have anything to win, except perhaps to possibly avoid unemployment, by moving to a large city.

The hopes that the girls with working class backgrounds express about the future are to a great degree about family and relationships, and consequently there is certain flexibility in their thoughts about residence. What is, however, important for these girls is proximity and security, and therefore their home municipality appears to be a good alternative. But for working class girls as well, the threat of unemployment is something that prompts them to consider possible migration. The situation that can be assigned to the local “gender contract” is not cited to any high degree as restrictive by these girls. Instead they seem to know about and to a certain extent accept that there are limited opportunities open to them. The girls who accept/appreciate the traditional women’s role see a future in the region, while it seems as if a desire to find another role leads many girls to want to migrate.

A free choice?

The idea that young people today are “culturally disconnected” (Ziehe 1986) has not been confirmed in my study. On the contrary, my study shows that the desires of the young people to a high degree reflect their social backgrounds. The most prominent aspect is not the reflexive choice, but rather that the young people seem instead to follow a fairly unreflective desire to do “the natural thing”. The norms that exist about how you “should” be as a young person, what is “normal” and “natural”, are connected to class and gender. It seems to be that working class young people and their parents live with the perception that “the natural thing” is that there is employment in the local area and that you should stay there. The perception of the middle class families and middle class young people of “the natural thing” is more in line with the idea of adolescence as an orientation towards the urban and modern. It is therefore “natural” for those who want to be a modern adult to seek the big city.

So what is a free choice based on all these different starting points? That the choice to migrate would be free in the sense that it occurs without external influence, has been contradicted, I believe, by my own and others’ research. My studies, as many others, do not show individualized choices to any great degree.

Can a free decision instead be to realize your desires? The horizon of opportunities of young people can be limited by a number of factors. One of the most essential factors for the opportunities of young people to realize their goals is to have their own livelihood. The desire of the working class young people to be able to stay in the area does not provide particularly high status, nor does it offer particularly bright future prospects. It is more that they are expected to adapt their desires to reality and realize that a future in the area is not possible. It seems as if the experiences of working class young people bring them to believe that “anything is possible” and that it is worthwhile to keep looking for “the very best”, to a much lesser degree than among the middle class. The desire of working class young people to be able to stay in their home locality is perhaps instead about holding on to “something” of the good life. In addition it isn’t obvious that living in a large city means increased opportunities for everyone, it is more likely that the middleclass will make a rising career (Andersson 1996, 2000).

The middle class boys seem to be the ones most assured that there is a place for them both “at home” and “out in the world”, and their choice to go out into the world appears to be relatively uncomplicated. The desire of middle class girls to “move on” is probably based to some degree on a feeling that they don’t fit in their home municipality, but the choice to migrate seems to a great degree to have a positive feeling and be filled with hopes. Seen from this perspective, to have the opportunity to choose what you desire, the choices of middle class young people seem to be freer. They can choose what they desire to be able to choose, and this choice gives them relatively bright future prospects and high social status.

Several researchers (see e.g. Giddens 1991, Beck 1992, Furlong & Cartmel 1997) discuss whether the real room for action has increased to the same degree as the thinking of young people – that has been characterized by increasingly broader horizons of opportunity (Ziehe 1986). It isn’t just that young peoples’ experience of personal responsibility for the choices they make have been individualized, but also the responsibility for *the results* of these choices. In a somewhat exaggerated tone you could say that they are free to blame themselves.

Young people - regional development?

In the eyes of middle class adults young people demonstrate their ambition and ability by making the decision “to go out into the world”. Regional policy makers realize that young people are needed for the region’s survival, but, in line with the values and traditions of the middle class, they don’t want to convince the young ones to stay since the opportunities for the “modern” and “youthful” are assumed to be found elsewhere.

Local politicians and civil servants are in the middle of the conflict between the needs of local society for young people to take over the duties of the welfare society, and the duty of modern people to themselves make “the best” of their own lives. The middle class’s judgement of what is “the best life” is reflected in the civil servants’ and politicians’ view of what “real” and “normal” young people want and do.

To be an individual who can quickly depart and melt into new environments is a contemporary ideal, but this ideal is not realistic for working class young people, based on the actual opportunities, norms, values, and assumptions that make up their horizon of opportunity. The life choices of working class young people could be seen as regional assets, but for the influential adults remaining in the area this is not an active decision, but rather evidence of passivity and incompetence. In this way these young people have no experience or awareness that they might be able to contribute to regional development. Instead they are reinforced in their self-image, that they are resource-poor and without influence.

If the young people, who want to remain in the area, “don’t count”, neither will they become interested in themselves developing the society. In order that the resources that are included in social relationships shall accrue to the advantage of the individual or the group, the individual has to be aware of his or her resources (Lin et al 2001). The young people who say they want to “step up” and shoulder the responsibilities of previous generations aren’t noticed at all, or are regarded with distrust by many of the adults around them, since they are regarded as passive or unengaged. The working class young people in Söderhamn are met by a double message, where on one hand it is they who will shoulder the future of the region, while on the other hand they are stigmatized and perceived as having a lack of ambition just because this is what they want to do.

Even if the need for renewal is recognized in the region, the prevalent values mean that the young people who show interest in and a desire to remain are not regarded as the renewers of regional development. The norm and the internal logic that says that the young people “who count” will want to migrate, has as a consequence that there is no point in attracting young people to local development efforts. Seeing and treating the young people who want to stay as passive and lacking initiative risks contributing to the impoverishing of regional development. The young people who feel that there is no place for them *anywhere* can be assumed to be losers. The regions where they will live risk becoming losers in the same future scenario. Surely, therefore, the question is if the entire country could be at a loss when there are uninvolved people in impoverished regions?

References

For a total reference list see my thesis:

<http://www.diva-portal.org/liu/theses/abstract.xsql?dbid=6524>

- Aagaard Nilsen, K. & Svensson, L. (2006), *Action Research and Interactive Research. Beyond practice and theory*. Hamburg: Shaker Verlag.
- Andersson, R. (1996), *The Geographical and Social mobility of immigrants: Escalator Regions in Sweden from an Ethnic Perspective*. *Geografiska Annaler B*, 1996:1, s 3-25
- Andersson, R. (2000), *Karriärernas geografi – en fråga om arv och miljö*. I Berger S (red) (1991). *Det nya samhällets geografi*. Uppsala: Uppsala Publishing House AB
- Beck, U (1992). *Risk society: towards a new modernity*. London: Sage
- Castles, S & Miller, M J (1998). *The age of the migration. International movements in the modern world*.

- Furlong, A. & Cartmel, F. (1997), *Young People and Social Change: Individualization and Risk in Late Modernity*. Buckingham: Open University Press
- Giddens, A (1991), *Modernity and self-identity: self and society in the late modern age*. Cambridge: Polity Press
- Jackson, J A (1986), *Migration – Aspects of modern sociology. Social processes*. London: Longman
- Johansson, K. (2003), *Bli vuxen i arbetarstad*. Linköping studies in Arts and Science No 276. Linköping: Unifryck
- Jonsson, C. (1994), *Ung i Åmål*. Göteborgs universitet. Göteborg: Länstryckeriet
- Lin, N., Cook, K. & Burt, R. S. (2001), *Social Capital: Theory and Research*. New York: Aldin de Gruyter
- Ravenstein, E G (1889), *The laws of migration. Second paper*. *Journal of the Royal Statistical Society*, vol XLVIII, 241-305
- Skeggs, B (2000), *Att bli respektabel. Konstruktioner av klass och kön*. Göteborg: Daidalos
- SOU 1998:89, *Greppet – att vända en regions utveckling*. Rapport från Söderhamnskommittén.
- Svensson, L. (2005), *An interactiv approach and combined methods: Development of applied youth research. I: Helve, H (ed) (2005). Mixed Methods in Youth Research*, s 252-273. Finland: Finnish Youth Research Network
- Svensson, L. (2006), *Vinna och försvinna? Drivkrafter bakom ungdomars utflyttning från mindre orter*. Linköping: Linköpings universitet
- Svensson, L. (2012), *Att växa upp i storstadsskugga – i Vimmerby, Hultsfred och Eksjö*. FoU Söderhamn, Söderhamns kommun.
- Tilly, C (1990), *Transplanted networks*. i Yans-McLaughlin, V (red) (1990) *Immigration reconsidered: History, sociology and politics*. New York: Oxford University Press
- Trondman, M. (2001), *Att flytta eller stanna? Centrum för kulturforskning, Rapport nr 2*, Växjö Universitet
- Willis, P (1977), *Learning to labour*. Göteborg: Röda Bokförlaget
- Ziehe, T. (1986), *Ny ungdom: om ovanliga läroprocesser*. Stockholm: Norstedt
- Åström, G. & Hirdman, Y.(red) (1992), *Kontrakt i kris. Om kvinnors plats i välfärdsstaten*. Stockholm: Carlssons förlag

Personal indebtedness, spatial effects and crime: a comparison across the urban hierarchy.

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Introduction

The recent recession has made understanding the relationship between economic conditions and crime crucial to public debate. In this paper we seek to understand the spatial pattern of property and theft crimes using a range of socioeconomic variables, as well as data on the level of personal indebtedness, for two regions of the UK: London (the capital city) and the North East of England (a peripheral region).

Building on earlier published work in this area, this paper will contrast the regression results obtained in both of these regions. This allows a comparison of the factors that are important in explaining the observed pattern of theft and property crimes, including an analysis of the spatial dimension of these factors, between these two regions. Doing so will allow a comparison of the elements that are important in explaining the observed pattern of theft and property crimes across the two regions.

Background theory and motivation

The recent global recession has brought the issue of the relationship between economic conditions and crime to the fore of public and scholarly debate. There is a long and detailed history of attempts to understand what causes crime. One of the most prominent strands of this literature sought to understand the relationship between unemployment and crime. Following Becker (1968), the economic argument suggests that in an attempt to maintain consumption in the face of increased unemployment, people may resort to sources of illicit income. In a similar manner, we might expect, ex-ante, that increases in the level of personal indebtedness (which may itself be a symptom or consequence of increased unemployment or economic downturn) would be likely to provide similar incentives to engage in criminality.

In the context of the current economic downturn affecting most, if not all, parts of the world, understanding the relationship between personal debt and crime is vital to understanding the consequences of governmental action or inaction. Increases in personal debt- which the government may encourage during a recession to boost aggregate demand- may in fact prove, at least partly, counterproductive if they require additional government resources to counter an increase in crime stemming from debt default.

To understand the peripheral region aspect of this analysis, let's take just one example, an important factor in the crime level in a particular area is known to be population density. For crimes against property, higher population density is said to be negatively related by increasing the probability of detection. In contrast, for personal theft crimes, higher population density is thought to be positively related as it increases the number of potential targets.

In the case of a large city such as London, population density might show little variation, and thus population density may not have the impact that theory suggests. In contrast, in peripheral regions it will be the case that the much greater variation in population density compared to a large city, suggesting that population density may play a different role in explaining the observed pattern of theft crimes.

Literature

This work sits at the intersection of at least three literatures; economics, sociology and criminology, but there are some common themes:

- That there are two main effects that need to be considered in trying to understand observed crime: motivation and opportunity.

- That it is important to control for a range of economic, socioeconomic and spatial variables.
- That the relationship underpinning observed pattern of crime is complex and there can be important causality and/or endogeneity issues.

In terms of the economics literature the starting point is a paper by Becker (1968) which looked at the relationship between unemployment and crime, formalising this theoretical relationship. In many ways the work outlined here is a straightforward extension of this theory to account not simply for the move from a legitimate income to an illicit one, but from employment through a period of debt accumulation, ultimately debt default and then perhaps the need for illicit income streams.

There has been a reasonable literature looking at the relationship between unemployment and crime. Just in a UK context, there are two principal papers investigating this relationship: Pyle & Deadman (1994) for Scotland, and Carmichael & Ward (2001) for England and Wales. There are other papers in the economics literature on crime which warrant a mention, these include Cherry & List (2002) who demonstrated that the explanatory variables which are important in explaining the observed variation in crime rates differ by crime type, and Buonanno (2012) who looked at the role of social sanctions in understanding the observed pattern of crime.

In the Sociology literature there are a number of papers which relate to the work presented here. These include a paper by Voss & Petersen (1971) who emphasised the spatial dimension to crime, linking to the use of spatial econometric methods in this analysis. Two other papers are particularly important in the context of this analysis. The first is Cantor and Land (1985) who looked at the relationship between crime and unemployment, emphasising the *motivation* and *opportunity* effects. The key thing here is to ensure that in explaining observed crime rates we capture both of these effects.

In our analysis the level of personal debt provides a *motivation* effect, while population density captures one aspect of the *opportunity* effect. This is a point which is developed in a paper in the criminology literature (Danziger (1976)) which considers the role of population density in increasing the potential pool of victims for certain types of crime. One final paper to note is Box (1995) which examined the impact of recessions on crime. This paper again links to our analysis here in that personal debt plays a vital role in consumption smoothing by households, particularly during recessions and bouts of unemployment.

Data

The table below gives details on the variables used in this analysis. In order to capture 'neighbourhood' effects in this analysis we used data at the Middle Layer Super Output Area (MSOA) level. The UK Office of National Statistics maintains a series of administrative geographies for neighbourhood data. Super output areas (SOAs) are fixed geographies which are offered at two levels, middle and lower.

There are 7,193 Middle Layer SOAs (MSOAs) defined based on the 2001 census and released for public use in 2004¹. These MSOAs had an average population size of 7,200 households, compared to an average of 1500 households in the Lower Super Output Area (LSOA) level. In London there are 983 MSOAs, which when we exclude the 'City of London' MSOA results in 982 areas in this analysis.

Variable	Variable description
Value of CCJ	Total value of CCJ's granted in each area in 2004 in (£).
Population turnover	Net change in internal migration per 1000 persons 2004/05.
% pop 0–15	Percentage of population aged 0–15 (mid-2004 model based estimates).
% pop 16–24	Percentage of population aged 16–24 (mid-2004 model based estimates).
Houses in poor condition	The modelled probability that a house in the area will fail to meet the UK Government Decent Homes standard. Data used are averages of lower super output area values for 2004.
Income	Average weekly household total income (ONS model based estimate) 2004/05.
Pop. density	Number of persons usually resident per hectare (based on 2001 census data).
All crime variables	Recorded crimes in 2004/05 per 1000 persons usually resident.

All variables were obtained from the Neighbourhood Statistics service operated by the UK Office of National Statistics.

Data overview

In order to illustrate some of the differences between London and the North East of England administrative regions, i.e. comparing a large city region with a peripheral region, we present a few diagrams below which

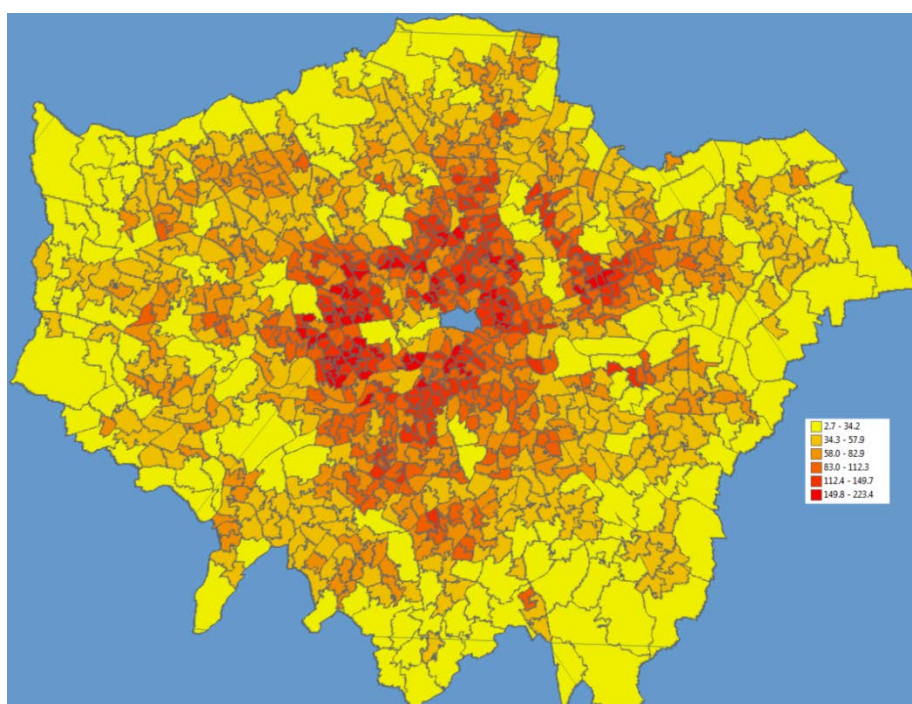
allow us to compare the spatial pattern of population density and income. Figure 1 and 2 illustrate the differences in population density across space in London and the NE region.

It is clear from Figure 1 that London's population appears to decrease in all directions from the centre with circular bands of lower and lower population densities. Whereas from Figure 2, it is clear that in the North East region there are areas of higher population density around main cities, but no other spatial pattern, and large areas of low population density.

Methods

In this paper we utilise spatial econometric methods (outlined in LeSage & Pace (2009)). We estimate 3 spatial econometric models for each crime typeⁱⁱ and conduct posterior model comparisons to select which model is the best fit for each crime type. In McIntyre & Lacombe (2012) we only reported the results from the best fit model for each crime type. For more details on the modelling approach taken to generate the results discussed here see McIntyre & Lacombe (2012).

Figure 1: Population density London (number of persons usually resident per hectare)



Results

In McIntyre & Lacombe (2012) we established a number of key results, principally that in London the level of personal indebtedness (measured by the total value of CCJs in each area) in a neighbourhood was positively associated with thefts from the person and robberies. A number of other results were of interest, but given the focus of this paper we restrict our discussion to the results relating to the role of population density in explaining the observed pattern of crimes.

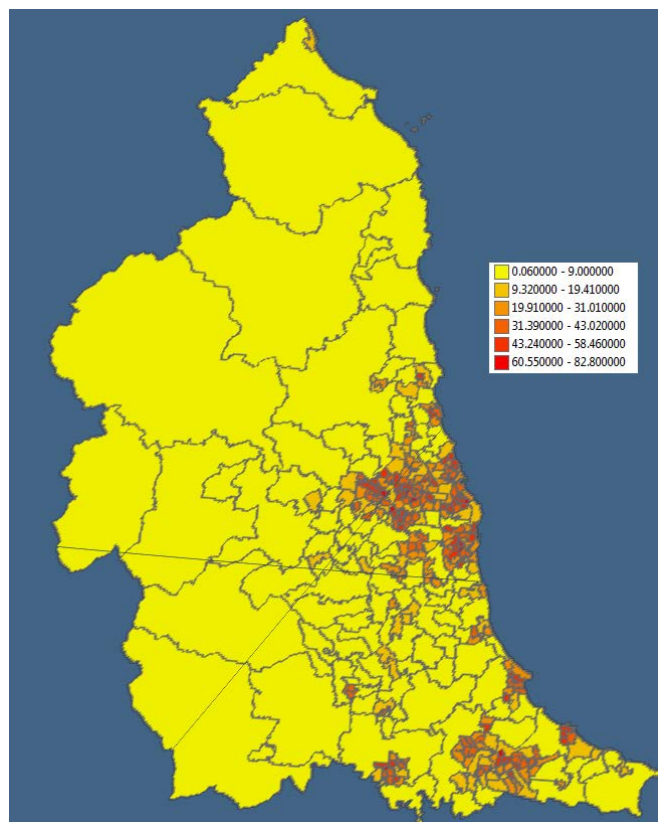
In London we established that population density was negatively associated with all categories of crime except burglary of a dwelling where it was insignificant. For some types of crime, the literature suggests that the higher the population density the higher the number of potential victims and therefore the greater the crime rate. Crimes of this type typically include personal theft crimes. Our results for London therefore did not accord with this theory.

Our hypothesis was that this was due, at least in part, to the much greater level of population density in London compared to the NE region. The average population density of our MSOAs in London was 72.60 persons usually resident per hectare with a standard deviation of 41.16, compared to the average population density in the NE region of 24.56 persons usually resident per hectare with a standard deviation of 18.56. To put this into perspective, notice that the average population density value in the NE region is

too low (24.56) to make it into the 1st standard deviation for the London region (where 68% of MSOAs in London are to be found) which is between 31.44 and 113.76 persons usually resident per hectare.

When we generated our results for the NE region, we found that for robberies population density was insignificant, but that population density was positive and significantly associated with thefts from the person. This suggests that in more peripheral regions the lower population density and the lower variation in population density means that areas of higher population density are indeed- as theory suggests- associated with higher personal thefts owing to the greater concentration of potential victims.

Figure 2: Population density NE Region (number of persons usually resident per hectare)



Conclusions

The work discussed in this paper has sought to better understand the relationship between different economic and socioeconomic factors and property and theft crimes, and how this changes across the urban hierarchy. The focus of the discussion here has been on the differences obtained from crime regressions for a large city-region (London) and a peripheral region of the national economy (NE England).

We focussed the discussion on the impact of population density on the crime rate in these two regions. This was partly because the results for London presented in McIntyre & Lacombe (2012) for the relationship between population density and personal theft crimes were not in accordance with theory. Our hypothesis was that this was due, at least partly, to the nature of population density within the London region, as discussed and explained above. Comparing our London and NE England results it suggests that in terms of the impact of population density on crime there are important differences with the results for the NE England region in accordance with theory.

References

- Becker, G.S., 1968. *Crime and Punishment: An Economic Approach*, *The Journal of Political Economy*, 76(2) pp.169-217
- Box, S., 1995. *Recession, crime and punishment*, Macmillan Education, London
- Buonanno, P. Pasini, G., Vanin, P., 2012. *Crime and social sanction*, *Papers in Regional Science*, 91(1)
- Cantor, D., Land, K.C., 1985. *Unemployment and crime rates in the post-World War II United States: A theoretical and empirical analysis*, *American Sociological Review*, pp. 317-332

Carmichael, F., Ward, R., 2001. *Male unemployment and crime in England and Wales*, *Economics Letters*, 73(1) pp. 111-115

Cherry, T.L., List, J.A., 2002. *Aggregation bias in the economic model of crime*, *Economics Letters*, 75(1) pp.81-86

Danziger, S., 1976. *Explaining urban crime rates*, *Criminology*, 14(2) pp.291-296

LeSage, J.P., Pace, R.K., 2009. *Introduction to Spatial Econometrics*. CRC Press, Boca Raton, FL

McIntyre, S.G., Lacombe, D.J., 2012. *Personal indebtedness, spatial effects and crime*, *Economics Letters*, Volume 117, Issue 2, November 2012, pp. 455–459

Pyle, D., and Deadman, D., 1994. *Crime and unemployment in Scotland: some further results*. *Scottish Journal of Political Economy*, 41(3) pp.314-324

Voss, H.L., and Petersen, D.M., 1971. *Ecology, crime, and delinquency*, *Appleton-Century-Crofts*

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<http://neighbourhood.statistics.gov.uk/dissemination/Info.do?page=aboutneighbourhood/geography/superoutputareas/oa-intro.htm>

ⁱⁱ These were: the spatial autoregressive model (SAR), the spatial error model (SEM) and the spatial Durbin model (SDM). Refer to LeSage & Pace (2009) for a textbook discussion of these models.

