

THE DOUBLE CRISIS: IN WHAT  
SENSE A REGIONAL PROBLEM?

Betsy Donald and Mia Gray

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# **THE DOUBLE CRISIS: IN WHAT SENSE A REGIONAL PROBLEM?**

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Betsy Donald  
Queen's University  
Kingston, Ontario  
Email: [betsy.donald@queensu.ca](mailto:betsy.donald@queensu.ca)

Mia Gray  
University of Cambridge  
Email: [mia.gray@geog.cam.ac.uk](mailto:mia.gray@geog.cam.ac.uk)

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## **Abstract**

We are now facing Sayer's 'diabolical double crisis' – which encompasses both a deep financial crisis and an environmental one. The scale, scope and nature of this double-crisis is downplayed in the regional studies literature, much of which still focuses on innovative growth models often divorced from broader social and ecological contexts. To help solve both crises we call for regional studies to explore new models that allow us to focus on the most important issues of our time. We illustrate this by focusing on the contradictions in the waste produced by contemporary regional economies – waste of abundance, labour, and resources.

**Keywords:** inequality, climate change, precarious labour, waste, wealth, redistribution

**JEL Codes:** D63, E21, E24, F64, O44.

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## 1. Introduction

During the last few decades, scholars of regional studies have led academic and policy debates on the state of regional economies in a global world. These debates centered on ideas of *regional* aspects of economic and institutional forms, inequality, and the spatiality of power. It is easy to forget how revolutionary some of the ideas were and how they challenged existing paradigms and canonical thought. One such article was Doreen Massey's 'In what sense a regional problem?' (Massey, 1979) which argued for new ways of considering regional inequalities by examining how the specificities of place are inextricably bound in its wider spatial context and the flows of capital and power. In this way, Massey encouraged a real paradigm shift as she encouraged the discipline to reconceptualise regional inequality and uneven development. Massey's work on regional uneven development is more salient than ever as there is increasing recognition that today's generalized social injustices and inequalities are manifested in environmental conditions, the global market economy, and state responses.

We argue that we are in what Andrew Sayer (2015, p. 29) calls a 'diabolical double crisis', that is 'on the one hand, a deep financial crisis, on the other hand, the threat of runaway global warming'. The scale, scope and nature of this double-crisis, with few exceptions, has been downplayed in the regional studies literature, much of which continues to focus on innovative regional growth models often divorced from the broader economic, social and ecological context. Hadjimichalis and Hudson (2014) make a similar critique about the crisis of contemporary regional development theory -- its failure to assess the onset of the 2007-08 financial crises and its inability to explain the consequences. They argue that contemporary regional theory has focused too much on regional success stories at the expense of examining the nature of capitalism as an inherently crisis prone social system of accumulation with uneven geographical outcomes. We are sympathetic with Hadjimichalis and Hudson's call. However, their critique needs to be extended to incorporate the inextricable link between the global financial crisis and the environmental one, especially at the regional level. The motivation of our article, then, is to explore Sayer's double crisis through an examination of the production and reproduction of inequality and waste as we explicitly ask the questions: in what sense is the double crisis a *regional* problem? And, in turn, to what extent can regional theory be part of the solution?

Fortunately, there is growing research on the sustainability transition perspective (Truffer and Coenen, 2012; Bulkeley and Newell, 2015) and research which explicitly attempts to bridge the environmental movement with the concerns of regional development (Gibbs et al., 2005; Gibbs and O'Neill, 2017; Healy and Morgan, 2012). This is important literature focusing on regional practices, such as clustering and networking, which could lead to a more environmentally sustainable economy. However, these contributions which bring together issues of economic and environmental change remain on the fringes of regional studies. Given these contributions, does it really matter if only a few regional scholars are contributing to these debates? We argue it is important because the reification of competitive consumption-led growth models in regional studies has exacerbated, legitimised, and celebrated the dominant narratives in public policy. This dominant narrative assumes the two crises can be solved together through existing narratives of economic growth. Until we begin to disrupt this narrative of growth, it is unlikely that regional scholars will be part of the solution moving forward.

The paper begins by explaining this double crisis and linking it to the production of inequality and waste, arguing that regional studies has failed to explore the contradictions and complexities that this entails. As the double crisis was occurring, regional studies implicitly followed a growth agenda which emphasised the prescriptive narrative of growth and innovation. While the best of this literature tried to set out an alternative agenda for rethinking the relationship between the economic, social and the environment, much of it ended up as 'theory led by policy' (Lovering, 1999). There was very little questioning the growth model implicit in the contemporary economic and social structures so when the financial crisis hit, regional scholars were not leading debates about how we might recover from the economic crisis, while restructuring our economies to account for the environmental crisis.

We briefly review the literature which critiques how growth is embedded in all our economic models, paying particular attention to those scholars who have unpacked the relationship between growth, environmental crisis and social inequality. One of the clearest messages from the financial crisis is that the current model of economic growth is fundamentally flawed, and a key argument on climate change is that changing our theories of growth is an ecological necessity. Drawing on insights from this literature, we argue for the creation of a new model of regional economic and environmental well-being, focusing on reducing inequality and waste within the system in terms of wasted abundance, wasted labour, and wasted resources. We make clear these questions are not just global, but are also regional and thus relevant for regional studies and theory. We argue that the crisis itself has not only forced a

rethinking of economic and environmental policy, but also allows us as scholars to rethink and restructure regional theory. In a time of populism with the election of Trump, the vote for Brexit, and the general rise of regional discontent, it is more important than ever for regional scholars to examine new models and approaches of sustainable, equitable, and just development.

## **2. Sidetracked Regional Studies**

In the late 1970s and 1980s, regional scholars were at the forefront of exploration of alternative organizational economic and social forms, which had the potential to radically transform uneven regional development and reduce inequality. The literature exuded confidence about the potential of regional development – especially localized public and private institutions -- to build regional and institutional capacity for development. Many scholars called upon Piore and Sabel's (1984) classic book, *The Second Industrial Divide*, to extol the resilience of Marshallian industrial districts – the small-scale, regional economic growth found in the third Italy, Germany, and other parts of Europe. The author's accounts of flexible specialisation were infused with a celebration of alternative regional economic systems where skilled workers were valued, collaboration balanced competition, trust balanced self-interest, and social institutions played a fundamental role in regional economic success. Their account was an influential argument which launched a thousand research studies into the new-found belief that regional economies had the potential to be more politically and socially progressive (Gertler, 1995; Saxenian, 1990).

Slowly, much of the focus on regional economies transmuted from the exploration of alternative regional economic systems to the promotion of competitiveness and growth through such ideas as cluster development, network promotion, and a strong concern with the form and function of innovation (Porter, 1998; Cooke and Morgan, 1998; Morgan, 1997; Storper, 1995); leading to what Martin describes as an 'obsession with agglomeration' in the spatial literature on regional economies (Martin, 2015). The discourse on regional competitiveness was further strengthened with the rise of the creative class thesis in the late 1990s (Florida, 2002). While the creative class thesis was highly criticized for its promotion of neoliberal urban culture (Peck, 2005), it nevertheless fueled a plethora of regional studies which took growth for granted and yet was unable to assess the nature of growth and its distribution. Even many progressive regional academics found themselves entangled in a rather prescriptive narrative of growth imperatives and the new competition with their focus on clusters, creative classes, and regional innovation systems. So, when the global financial downturn hit, many regional scholars lacked

a theoretical and analytical framework in which to assess the contemporary limits to growth.

### **3. The Double Crisis -- Economic Crisis**

While many regional scholars were focused on competitiveness and endogenous growth, others were highlighting the dual crisis of the unsustainable levels on economic inequality, which became exacerbated by the 2007-08 financial crisis and the on-going crisis of climate and global environmental change.

The story of the 2007-8 financial crisis is well-known. The crisis originated in the US sub-prime mortgage market, where banks repackaged and sold this poor-quality debt to the global financial markets as high yield and low risk. Thus, when the sub-prime mortgage markets imploded, it reverberated throughout the global banking system. Both political and economic capital was spent saving the global financial system by recapitalizing the banks and adding liquidity to the banking system. Initially, governments focused on rescuing systemically important financial institutions and re-flating their economies (i.e., increasing the money supply through a policy termed 'quantitative easing'). Quantitative easing functioned to boost financial asset prices and stabilise the financial institutions. However, recapitalising the banks and adding liquidity to the banking system transformed the private banking crisis into a public sovereign-debt crisis (Blyth, 2013).

Crucially, public blame was rarely apportioned to the under-regulated banking system, but instead to profligate government spending -- particularly in peripheral European countries (despite the fact that none of these countries, except for Greece, had problematic budget deficits before the crisis) (Konzelmann, et al. 2016). The branding of the crisis as a problem resulting from profligate state spending gave rise to another policy cure: fiscal consolidation or economic austerity. World financial institutions, central banks, and national policy makers quickly found consensus around austerity policies. The academy also played a part in justifying austerity programs. Reinhart and Rogoff's research (2010) argued that high levels of public debt have long-term negative consequences on growth and that austerity is required to reduce public debt-to-GDP ratios to produce economic growth after the financial crisis.

Although Reinhart and Rogoff's research was ultimately discredited (Herndon, et al. 2014), policy consensus continued to stress the importance of reducing public debt. International financial institutions demanded strict austerity measures of countries such as Italy and Greece, in return for international financial support and

a restructuring of debt. Other countries, such as the US, the UK, and Ireland chose the pace and scale of austerity policies in order to send positive signals to market analysts (Kitson et al., 2011). Thus, austerity policies were enacted in country after country. Although the details differed, and the regional and urban implications varied (Donald et al., 2014), they all shared a desire to restructure the role of the state, to reduce public benefits and obligations, and to shrink the public-sector workforce. These governments chose austerity -- even if that produced ever greater levels of inequality, social injustice, and environmental degradation.

### ***Growing inequality***

Despite regional scholars downplaying the study of inequality in recent decades, there is a long history of inequality research in academia and in policy circles; from disciplines, as disparate as geography, sociology, epidemiology, and economics; and, increasingly, from across the political spectrum. The rise in inequality is a long-term trend, which predates the financial crisis, but is exacerbated by national austerity programmes.

This renewed agenda on inequality is prominently signaled by the mainstream success of Thomas Piketty's book, *Capital in the Twenty-first Century* (Piketty, 2014), which argued that the returns to invested wealth would always grow faster than returns to labour dependent on wages, which inexorably leads to increased inequality. In a similar manner, Wilkinson and Pickett's (2009) book, *The Spirit Level: why more equal societies almost always do better*, examines data that shows that many social problems are correlated with higher levels of income inequality. They show that issues such as declining levels of trust, increasing anxiety, and excessive consumption norms are more common in countries where income inequality is higher, thus crucially arguing that inequality is a collective, not just an individual, problem. This is because inequality fuels individual's anxiety about where they sit in the social hierarchy and that this, in turn, fuels constant consumption.

Inequality has not featured prominently in most mainstream economists' models, and certainly not inequality's relationship to financial instability (Galbraith, 2012). Despite this general lack of theorisation, economists such as Paul Krugman and Joseph Stiglitz, have continually stressed the pernicious effects of economic inequality (Krugman, 2013; Stiglitz, 2013).

Likewise, geographer Danny Dorling has done much to continue to highlight issues of inequality. Over the years, his work has focused on poverty, various types and measures of inequality and, unlike the economists above, the spatial variation of the above (e.g., Dorling, 2014; 2011). Dorling's recent work shows that income inequality in Europe is most severe in the UK, which resembles the US rather than other European countries (Dorling, 2015).

Of course, regional scholars have not been absent from the resurgent interest in inequality. Work has focused on both territorial and interpersonal inequality (Rodriguez-Pose and Tselios, 2009; Martin, 2008, Rodriguez-Pose, 2012). For example, Florida and Mellander (2016) remind us of the importance of unionization, race and poverty in explaining regional variation in income inequality (see also Perrons, 2012). However, regional inequality has remained a more potent issue than income or wealth inequality for regional studies. On the whole, the contemporary academic focus on economic inequality has not been a major debate for regionalists, just as the climate crisis has not.

#### **4. The Double Crisis -- Environmental Crisis**

The scientific evidence for global climate warming is unequivocal (Intergovernmental Panel on Climate Change, 2016). The current warming trend is particularly significant because the scientific consensus is that it is very likely due to human activities and 'proceeding at a rate unprecedented in the past 1300 years' (NASA, 2017 available at [climate.nasa.gov](http://climate.nasa.gov)). No matter the body of data collected – whether on sea level rise, global temperature rise, warming oceans, shrinking ice sheets, declining Arctic sea ice, glacial retreat, extreme events, ocean acidification, or decreased snow cover – the evidence is compelling.

Climate scientists, usually a conservative group, have been sounding the alarm bells for years but it is only recently that politicians and world leaders (notwithstanding the 2016 election of Donald Trump) have also raised resolve to address the climate crisis. Al Gore's 2006 bestselling book and film documentary, *An Inconvenient Truth*, went a long way to raise international public awareness about climate change and re-energize the environmental movement. A decade later, numerous policy

institutions published reports making the case for integrating environmental aims into economic policy. For example, even the World Bank sought to inspire change around the climate crisis -- noting that climate change will push 100 million people into 'extreme poverty' by 2030 as agriculture becomes disrupted and the world's poor are unprepared to deal with climate shocks such as rising sea levels and severe droughts (Hallegatte et al., 2014). Academics and policy makers have grounded our understanding of climate change in the unsustainability of consumption-led models within a planet of finite resources. This highlights the fundamental link between climate change and many consumption-led models of growth.

Notably absent from the climate and finite resource conversation, however, have been scholars publishing in the field of regional studies. While there are exceptions with work on green economies and industrial ecology (Gibbs and O'Neill, 2017; Gibbs et al., 2002; Truffer and Coenen, 2012; Coenen et al., 2012), there are few regional scholars that are actually making the explicit connection between our unsustainable industrial and consumptive economic system, rising social inequality, and the growing climate crisis and its implications for regions and regional development. While regional scholars have been good at calling for new models, we must now move beyond the discourse of 'another world is possible' and initiate a more exciting and agenda-setting program for the field. Our first step is to start seeing the double-crisis as a regional problem and for regional scholars to see themselves as offering direction forward. Some may question the extent to which it really matters that regional scholars contribute to these debates, but we argue that the intellectual and policy legacies of our recent, but more narrow focus on regional competitiveness leaves our discipline out of step with the most pressing regional environmental and economic issues of our times. Despite this recent trajectory, regional scholars are trained to be interdisciplinary and open-minded thinkers and as a result they have a plethora of intellectual traditions, skills, tools and regional concepts to draw from to think through more deeply the intricate relationship between the economy and environment.

## **5. Questioning Growth**

One approach forward would be to start a real conversation in regional studies about the meaning and nature of economic growth. Even given the contemporary environmental crisis, outlined above, this statement still seems heretical to many. The conventional view in economics is that we can continue to grow indefinitely because technological change will dematerialise the economy -- making products smaller, or even without material basis -- and thus, GDP will become increasingly decoupled from any ecological impact. However, Schor argues that

dematerialisation is hoped for by economists, but not yet observed. She points out that between 1980 and 2005, while many countries' GDP per dollar is now responsible for less material flow, this has been cancelled out by the increase in GDP (Schor, 2010, p. 43). Put another way, despite dematerialisation, the volume of material used globally, as well as in each individual region of the world, continues to rise.

In many ways, the limits to growth came to us through the pioneers of the environmental movement (Carson, 1962; Brown, 2001; Brundtland and Khalid, 1987). One important early contribution came from Meadows et al.'s (1972) *The Limits to Growth*, in which they explore the limits of economic and population growth with finite resource supplies. Early controversy turned into mainstreaming as researchers and think-tanks routinely updated the model. In 2009, Hall and Day published a paper in *American Scientist* 'Revisiting the Limits to Growth After Peak Oil' in which they argue that 'the values predicted by the limits-to-growth model and actual data for 2008 are very close' (2009, p. 234). Through the decades the scientific debate has changed from one focused on whether or not the environment is being degraded through resource exploitation to a debate on how to adapt to an already degraded environment. At the same time, environmental scholars have explored how to rearrange society and our economy in order to promote sustainability. This has included a focus on consumption norms, waste, new social collective forms, and nature-society relations (see for example, McKibben, 1989; Braun and Castree (2005), Jackson (2009), Whatmore (2002)).

Economics is the discipline where the assumptions about the constant necessity of growth are most deeply embedded into its very ontological and epistemological approach (Berg, 2016). However, even in this discipline we can see a long intellectual history which critiques the growth model implicit in our contemporary economic structure. John Kenneth Galbraith, writing in the late 1950s, problematized mainstream economic models which, in the midst of the largest recorded post-war boom, continued to privilege scarcity, economic efficiency and maximizing material growth. He argued that the focus on scarcity was perverse in a situation characterized by affluence and expanded choice about how to use the resulting abundance (Berry, 2013, p. 4).

Galbraith argued that the economics profession created an, often unchallenged, belief that production was an open-ended and self-validating process of meeting the limitless wants and needs of consumers. Mainstream economics has always maintained the importance of the sovereign consumer -- the wants and needs of independent consumers trying to maximize the benefit gained from consumption. In

this argument, Galbraith recalled Keynes' attack on the fiction of consumer sovereignty (Galbraith, 2015). Keynes argued that consumption is driven by primary and secondary needs – primary needs ‘are absolute in the sense that we feel them whatever the situation of our fellow human beings may be.’ (Berry, 2013, p. 89). While secondary needs are driven by status – needs ‘which are relative only in that their satisfaction lifts us above, makes us feel superior to, our fellows’ (Berry, 2013, p. 89). In the same vein, Galbraith distinguishes between satisfying basic human needs and the production of superfluous needs. Galbraith notes ‘[i]f the individual’s wants are to be urgent,’ he wrote, ‘they must be original with himself. They cannot be urgent if they must be contrived for him. And above all, they must not be contrived by the process of production by which they are satisfied. ... One cannot defend production as satisfying wants if that production creates the wants’ (Galbraith, 1998, p. 124). However, Keynes and Galbraith were unable to foresee the continued importance of, never-ending desire for, and industry’s constant creation of desire for consumer goods. Berry (2013) points out that although Galbraith saw the power of advertising and media in the continuous creation of demand, he was wrong in assuming that most people would quickly reach the limits of their desires.

This critique within economics has been revived with the rise of the ‘double crisis’. Many contemporary accounts further develop the contradictions between economic growth models and sustainability. Reflecting on the post-crisis economy, McGregor and Pouw (2016) argue that we need to ‘question this “growth-fetishism” and to modify our economics so as to acknowledge the increasingly urgent concerns for our social and natural environment’ (McGregor and Pouw 2016, p. 6). Likewise, economist Juliet Schor argues that another debt-financed consumer boom — which many scholars argue was underlying the bubble which led to the 2007-08 economic crisis – is no longer a viable option for individuals or the planet (Schor 2010). Like others, she advocates for a better distribution of work, less consumption, and a partial return to locally based economies. These ideas are also supported by contemporary heterodox economists like Skidelsky (2009), and Jackson (2009). Most traditional economists argue that we can ‘decouple’ GNP growth from resource use, however, Jackson argues this is a myth. A key argument surrounds the importance of climate change -- if we fail to cut greenhouse gas emissions we further undermine prosperity.

Clearly, it is not enough to go back to a model of post-war Keynesian re-distribution as it was not focused on the environmental crisis which has accelerated since the post-war period. In order to tackle the double crises, regional scholars need to bring together our ideas about inequality and the austerity crisis, environmental justice, and regional theory. We argue that by exploring the issue of waste, we are able to

reconceptualise how the issues of economic and environmental degradation can be brought together in a distributional model which builds on Massey and others radical regional theorists, but transforms their ideas to the contemporary crises. Waste, of course, can be tackled from many different perspectives. What follows is a selection of examples on how we can think about tackling waste from a regional perspective. We examine wasted abundance, wasted labour, and wasted resources, and then think about ways we can reduce, redistribute and renew these sources into productive assets through reworking paradigmatic examples of regional models .

## **6. Wasted Abundance**

In his book, *Why we Can't Afford the Rich*, Sayer argues that the top 1% in the wealth distribution is a burden for the well-being of the rest of society. Sayer calls for a different model based on his analysis of wealth distribution. According to the Oxford dictionary, wealth implies 'an abundance of valuable possessions or money', 'a plentiful supply of a particular desirable thing, well-being.' But Sayer challenges our assumptions that wealth is desirable for individuals and societies. He argues that not only do wealthy societies and individuals produce more pollution, but wealth inequality produces excess consumption and inequality drives consumerism as people consume in order to stake their place in the social order. For Sayer, 'reducing inequality is the first step to combining sustainability with higher levels of well-being' (Sayer, p. x). He argues that, up to a certain level, wealth is important to satisfy people's basic needs, but that the maldistribution of wealth and its intensification over the last three decades, has produced excessive abundance which is costly to the greater society and the earth. Although there is a strong match between subjective and objective well-being (Oswald and Wu, 2011), longitudinal well-being data suggests that wealth is not correlated with well-being or indeed happiness (DiTella and MacCulloch 2008; Gray et al., 2012).

## **7. Wasted Labour**

The global economic crisis in 2008 created many new market critics, even amongst the architects of our contemporary forms of capitalism. Alan Greenspan, who chaired the Federal Reserve in the US for almost 20 years, highlighted the intellectual failure behind the Federal Reserve's monetary management models. The 'whole intellectual edifice' of efficient, self-correcting markets 'collapsed' (Skidelsky, 2009, p. 165). This critique of markets has never been more true than when considering labour markets. Labour scholars have long problematised the extent to which labour can be conceptualized as a market at all since workers are constantly divided into distinct, non-overlapping, and

geographical segments (Wilkinson, 2013; Peck 1996). Furthermore, labour is embodied in specific gendered and racialised bodies and produce and reproduce cultural norms around emotional embodiment required of certain occupations, which serves to reinforce segmentation (McDowell and Court, 1994; Hochschild, 2003). Given this, any claim to the efficient use of scarce labour resources is hard to sustain when discussing society's use of labour. High levels of unemployment, underemployment, and exclusion from meaningful employment lead us to challenge notions of efficient or fair distribution of labour market opportunities. The current use of and distribution of labour resources is often highly inefficient and wasted human abundance is one of the outcomes. The UK currently leads Europe in the level of labour market flexibility, however, although unemployment rates are relatively low, the country has seen the proliferation of low quality jobs, many of which only offer zero hour contracts, part time work, or other forms of insecurity. Not only has the private sector reshaped many jobs to reduce stable employment opportunities and replace them with insecure jobs, but governments' austerity policies have contracted public sector employment and, thus, further reduced the number of well-paid, secure, often unionised, high quality jobs. Additionally, the 'loose labour market' has increased the number of workers 'pushed' into self-employment. This is not a story of entrepreneurial potential, but of more precarious self-employment. Self-employment in the UK was higher in 2012/13 than at any point over the past 40 years, however, at the same time the average income from self-employment fell by 22% over the previous five years (ONS 2014). We argue this proliferation of unemployment, underemployment, and hidden employment is the waste of people's skills and knowledges produced by the market system.

Here we draw upon Zygmunt Bauman's (2004) arguments about wasted lives when he highlights the problems of waste in contemporary labour markets. He argues, '[t]o be "redundant" means to be supernumerary, unneeded, of no use .... The destination of the *unemployed*, of the "reserve army of labour", was to be called back into active service. The destination of waste is the waste-yard, the rubbish heap' (Bauman, 2004, p. 12).

Likewise, Sayer (2009) also argues that underemployment can be seen as waste. Sayer's conceptualisation of contributive justice highlights not only the distribution of work (the quantity of work), but the importance of the distribution of the quality of work. He argues that stable, interesting work which provides dignity and identity is fundamental – that all workers want *good* jobs, where they can gain identity and sense of self, not just wages. Thus, underemployment, precarity, the nature and quality of work – not just the distribution of work -- becomes an issue of

justice. This is fundamental given the existing patterns of the distribution of meaningful and stable work. For example, in Europe we see large generational differences in the ability of people in different age-groups to contribute through meaningful work because of high rates of youth unemployment (Eurostat, 2017). Likewise, underemployment is a particular problem for the young. In the UK, the ONS (2016) estimates that 1 in 3 workers on zero hour contracts would like to be working more hours. The waste of skills in terms of the human capital embodied by the often-well-educated young is striking.

## **8. Wasted Resources**

One doesn't have to look far to find evidence of waste in terms of energy, natural resources, and landscapes. The U.S. alone consumes 3.2 Terawatts of the 13.5 Terawatts of global annual power a year and wastes half of that each year. In terms of water, the average American uses 2,000 gallons a day, 95% of this is from food, energy and products used every day. In terms of food, 40 percent of all food produced in the U.S. is wasted and 30.8% of all food purchased in the UK is thrown away. It is estimated that food waste alone in the US and UK could feed the world 3 times over (Ingenious Designs, 2017). Our insatiable appetite for resources and production of waste exceeds the earth's ecological capacity.

Our current and defunct economic and production systems as well as consumptive activity also produce wasted landscapes the world over. Alan Berger (2007) describes three elements of waste landscapes: (1) actual waste in terms of municipal solid waste, sewage, scrap metal, e-waste etc., (2) wasted places in terms of abandoned or contaminated sites, and (3) wasteful planned spaces, especially in the form of low-density, car-oriented urban sprawl setting in stone the future use of carbon-intensive transportation and development patterns.

### ***How does waste play out in place? Silicon Valley***

Many environmental scholars argue that we must understand the local dynamics of economies and politics in order to address global climate change. Bulkeley and Betsill (2007) argue that climate change is not only a global issue, but also "profoundly local" as cities and regions are sites of high consumption-led growth and producers of waste. Silicon Valley has long served as one of the paradigmatic examples of regional growth and innovation. It is the model that spawned regional theories of innovation and that other regions attempt to emulate but it is also a regional site of profound contradictions -- especially when viewed through the lens of the double crisis of climate change and economic distribution. This is why we

choose it as a case study for this paper and we examine it through two ways. First, we examine the region itself as a generator of inequalities the world over – in terms of a generator of hyper debt-fuelled consumption-led material norms, a generator of globalized monopoly platform capitalism, and global waste. Second, we take the celebrated nature of the region and explore the specificity of regional income inequality and waste.

For decades, regional scholars have celebrated Silicon Valley as the epicentre of innovative economic activity and technological dynamism, but we also know that the region exemplifies the rising income inequality as well as exhibits signs of excessive consumption, heavy reliance on household and local government debt, wasteful car-oriented sprawling landscapes, a high ecological footprint, and the proliferation of toxic hazards.

In 2016 The World Bank Group released a report on *Digital Dividends* which warned about how Silicon Valley tech firms were exacerbating income inequality rather than improving it the world over. While there are indeed many perceived benefits of digital technologies the report warns of the uneven distribution and highlights how many advanced economies face increasing polarized labour markets and rising inequality. This is in part because technology augments higher skills while replacing routine jobs. Moreover, the economics of the platform economy posed by firms such as Amazon, Facebook and Google favour natural monopolies which is resulting in more concentrated markets, benefitting incumbent firms.

At the national level, James Galbraith, (2012) in *Inequality and Instability: a study of the world of the economy just before the crisis*, argues that the rising inequality in the United States is closely associated with the tech boom and the rise in stock market valuations of the technology sector much of which is concentrated in the counties which make up Silicon Valley. Others point to the business model of the top Silicon Valley companies as promoting rapid obsolescence and overconsumption (Bossuet, 2014).

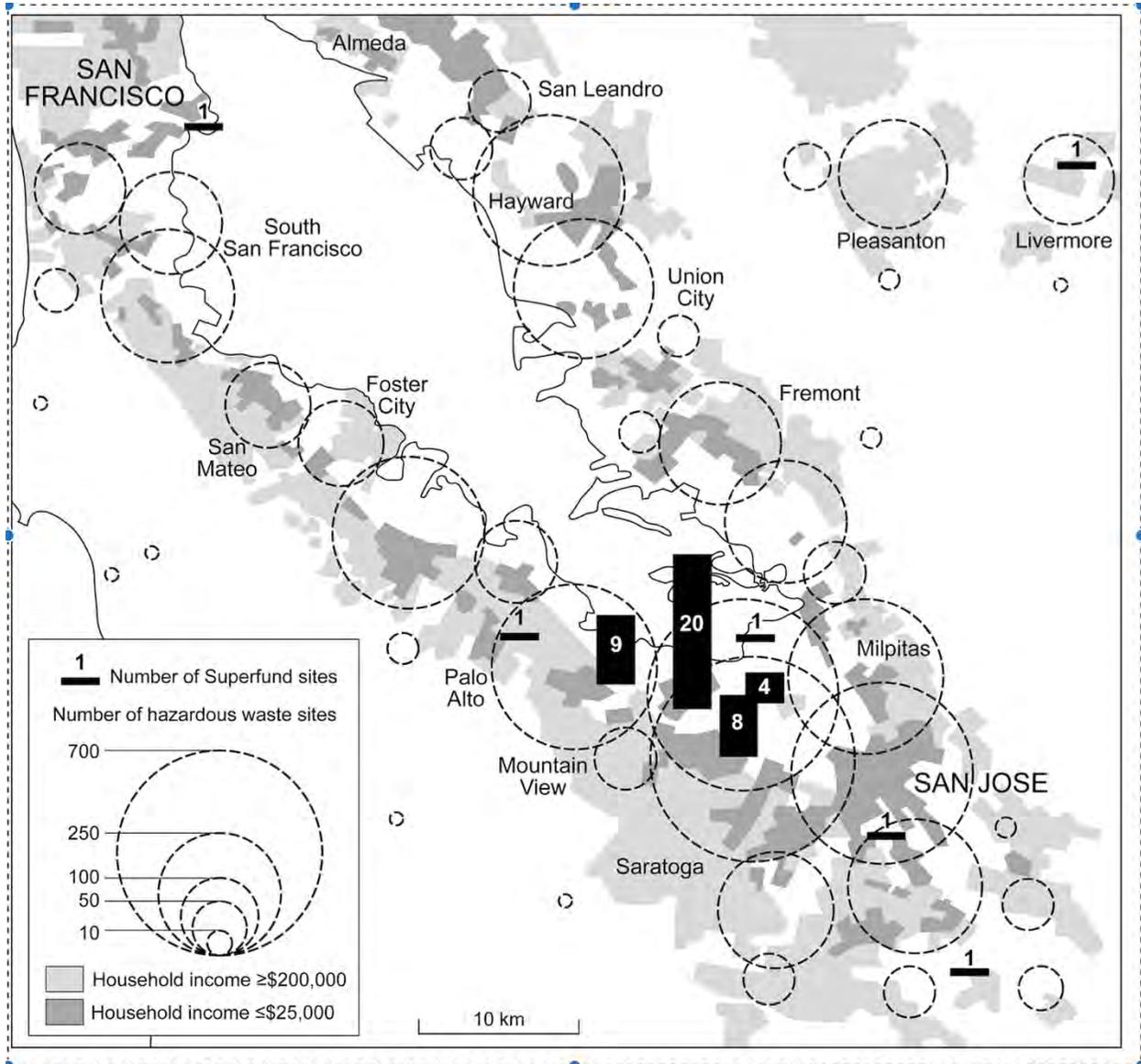
Locally, Silicon Valley's impact on inequality is contested as some scholars argue that many of the inequality and environmental problems of the San Francisco Bay Area are lower than they were a couple of decades ago (see Lee and Rodriguez-Pose, 2016). Others, however, see the region as generating and exacerbating income inequality in the Valley (Benner, 2002; Berube, 2018). While it is true that many successful technology companies pay top wages to their most skilled and valued employees, they also subcontract out lower skilled jobs such as cafeteria workers, janitorial jobs, security guards, and gardening work. Although job growth figures in

Silicon Valley are high, Benner and Neering (2016) report that subcontracted jobs have grown at three times the rate of all private sector jobs in Silicon Valley over the past 24 years, accelerating the region's growing income inequality. In addition, the high pay of their top employees produce yet ore jobs in the low-paid service sector to provide personal services, food, household reproduction functions, further exasperbating regional inequality.

The inequality in Silicon Valley's labour market is not played out in a homogeneous flat world, but instead is expressed through the deeply gendered and racialised embodied labour processes. The gender-income pay gap in Silicon Valley is significant and is wider in Silicon Valley than in San Francisco or California as a whole. For example, in 2015 men in Silicon Valley with a bachelor's degree earned an average of 50% more than women with the same level of education (\$117,000 annually compared to \$39,000). Ethnicity is another important characteristic which segments income and wages in Silicon Valley. Research on per capita income by race and ethnicity shows the distribution of income to be highly racialised. Analysing labour market inequality in Silicon Valley allows us to start to construct a very different narrative around the importance of Silicon Valley as a regional model. This alternative story would have to foreground issues of race and gender in understanding inequality in the region (Joint Venture Silicon Valley, 2017, p. 25, 29).

In addition to inequality, Silicon Valley has had its share of environmental challenges –everything from high rates of water and electricity consumption, hazardous waste, to unsustainable land-use, which has implications for affordable housing and the development of public transit. At the local level, Figure 1 illustrates that hazardous materials used in early high-tech manufacturing still remain an issue for local companies and communities. Silicon Valley itself is home to one of the nation's heaviest concentrations of toxic-waste sites. The Valley hosts the highest density of Superfund clean-up sites anywhere in the nation as others have said, Silicon Valley offers a sobering illustration of environmental inequality and other problems that are indicative of the problems of globalization (Robinson, 2009).

Figure 1. Hazardous Waste Sites in Silicon Valley Next to Household Income



Moreover, the majority of Silicon Valley's employment lands are inherently unsustainable in the form of a vast auto-dependent landscape of suburban office parks (Hurley, 2017). Most of the tech companies are housed in offices located miles from the nearest downtown and work is only accessible by car. In Silicon Valley, notes Hurley (2017, online) 'this preference for office parks is deeply imprinted on the landscape'. In the 1960s, 70s and 80s, as the region's tech industry grew quickly, executives found that the low-density office building model was easy to snap up in boom times and easy to dispose of when times were slow. The self-contained campus-like landscape was also good for collaboration and security. As Hurley (2017, online) notes, '[o]ver time, these real-estate practices were baked into a culture that emphasizes "churn," a dynamic of rapid growth and decline. The result: a fragmented, auto-oriented landscape that puts a heavy burden on the environment and society.'

So, this model of growth so celebrated in regional scholarship embodies the contradictions and tensions of our current models of economic growth. Although the economic crisis has hardly dented regions like Silicon Valley, certainly the inequality that is exacerbated by the crisis is evident and the environmental crisis is at the heart of both these crises in pushing growth, consumption norms, inequality, maldistribution and waste – in Silicon Valley itself and as a broader regime of growth promotion.

Silicon Valley may also, however, offer us an experimentation for a better future. Take Benner's work on regional labour markets, for example. His research focuses on the relationship between technological change, regional development and structures of economic opportunity, focusing on regional labour markets and their transformation (Benner and Pastor, 2013). Benner and Pastor make a strong argument that regional policy has the potential to make places more equal. For example, Silicon Valley Rising is a long-standing coalition of labour, faith leaders, community organisers, and workers who have created campaigns that highlight the region's problems with underemployment, falling wages, subcontracting, and lack of workforce diversity and that has won a number of minimum-wage victories.

One company in Silicon Valley, in consultation with a variety of regional actors, seems to be taking the idea of regional experimentation to heart. YCombinator, a well-known tech-company accelerator in Silicon Valley recently launched an expanded pilot program to test the idea of universal basic income. The company is providing a basic income of \$1000 and \$2000 a month to 100 families in Oakland, California for between six months and a year. The company will monitor and see what happens and if the experiment goes well, they will follow up with the main study (Smith, 2016). Governments around the world are trying similar pilots. In 2017 Finland gave approximately 2,000 unemployed white and blue collar workers a monthly basic income benefit without penalty for making extra income. The government planned to monitor them over a two-year period to see how people will use the money, however, in early 2018 Finland has since decided not to extend the model. What these some experiments tell us is that we are indeed in a period of enormous rethinking and experimentation. In communities around the world, policy makers are exploring policy options like basic income as a way to lessen the vulnerability associated with globalization and the reactionary response of populism. In the era of Donald Trump, Brexit and the rise of populism in the West, many global leaders are sounding the alarm bells that capitalism as we know it must change so that more people can benefit; otherwise the risk is that institutions that have underpinned the global economy since World War II will be dismantled (Goodman, 2016).

## **9. Sharing the Wealth: Reduce, Redistribute and Renew**

Sayer (2015, p. 2-3) makes a compelling argument that the rich are not something simply to be envied but the ways they ‘extract wealth that others produce...is not only unjust but profoundly dysfunctional and inefficient’. We see this when we think about the concept of waste and how it might be applied in the context of reducing abundance, renewing the future and meaning of work, and redistributing resources for the benefit of communities. This is where regional scholars have helped us think through the importance of multi-scalar approaches and governance issues in leading us away from a strictly national emphasis that characterises so many other disciplines (cf. Pike et al., 2010). In terms of the climate crisis outlined above, there is no question that runaway global warming is real and it is affecting our communities. Regional scholars could lead the way and work more closely with environmental scientists, local knowledge-keepers and scholars in documenting and exploring new institutions, policies and processes to help reduce our ecological footprint in places and reduce the consumption of products and fossil fuels. This entails not only producing more environmental regional analysis, but encouraging more regional scholars to include this in their more mainstream economic

approaches. We are starting to see this in Canada's North as climate scientists, Indigenous communities, and regional scholars work together to address pressing environmental, economic and social changes linked to a rapidly changing Northern climate as well as to social, political and colonial histories and practices (Way et al., 2017). We see it in experiments around circular economies and how we might bring this to a regional scale. In terms of reducing inequality, we have seen how current levels of inequality are unsustainable and we must find ways to ensure the current round of global capitalism is benefitting more people more fairly. Regional scholars could initiate research programs and institutional practices that move us towards a more inclusive and equal economy, especially in the context of an economy that values equity, inclusiveness and basic protections. There are currently many policy experiments around the world – including basic income and government mandated fair wage laws and incentives – that need evidence-based assessment; skills which many regional scholars have expertise. Closely related to this is the idea of renewing people and skills that signify a sense of identity and well-being. Again, regional scholars can help policymakers think more deeply about the research needed to understand the future of workers, work, and skills especially in our increasingly digital and machine learning age. It is important to remember that it is not about more education in the same way, but finding opportunities for people to apply their knowledges and find ways to support and give voice to the people often left out of the conversation.

## **10. Conclusions and in What Sense a Regional Solution?**

To paraphrase Winston Churchill, 'Never let a good crisis go to waste.' We agree that crises can be important cultural moments. Without being reductionist or overly structural in our analysis, we argue that points of crisis have the potential to do two things. First, crises can function to delegitimize previous approaches. Here, existing frameworks for understanding the social and economic world can be challenged and existing communicative narratives can be disrupted. This is true of the overly economic approaches which have dominated regional theory over the last 30 years - approaches which through their epistemological framework emphasize issues of efficiency over equity. Of course, this is not that automatic and existing explanatory approaches will continue to have many supporters. Second, crises can provide space to promote new intellectual structures and approaches. Times of crisis can open up a window for novel academic approaches and narratives. Here we see the potential for both disciplinary shifts and inter-disciplinary innovations. We argue this is something that regional scholars, naturally inter-disciplinary in approach, are well-positioned to do.

Regionalists have a well-developed response to the extremes of bottom-up versus top-down solutions. They are often comfortable talking about localism but within a broader regional, national, and global framework. They are adept at working within a multi-scale approach. Regional scholars are equally skilled at large empirical studies and grounded work in communities and understand the links between institutional practices and the cultural, social and environmental embeddedness of economic action. It is now time to apply these analytic skills to new models of sustainability within the context of the double-crisis of the environment and economy. We now need to turn our 'regional gaze' to these challenges of the 21st century.

Hadjimichalis and Hudson (2014) are right in their critique that too much contemporary regional theory has focused on a narrow understanding of regional success stories at the expense of examining the nature of capitalism as an inherently crisis prone social system of accumulation with uneven geographical outcomes. We can call upon our intellectual heritage in regional studies, by reexamining Doreen Massey's debates centered on ideas of the regional aspects of economic and institutional forms, inequality and the spatiality of power. But we must also look forward. We cannot just get out of the first crisis by intensifying and exacerbating the second one. Although regional scholars are justly intrigued by the success stories around regional innovation however, they must also understand issues of equity and justice and pay attention to the environmental damage of both production and regional consumption.

Regional scholars are well positioned to understand the extent of spatial decoupling of the two crises – as pollution-heavy industries can be separated from the sites of consumption and is often offshored to other countries. Thus, consumption is often no longer coupled with production and is the more important indicator to capture the problem of and potential solutions of the environmental crisis – both in terms of over consumption and disposal and waste. We argue that by exploring the issue of waste in its broader sense -- in terms of wasted abundance, wasted labour and wasted resources -- we are able to reconceptualise how the issues of economic and environmental degradation can be brought together in a distributional model which not only builds on Massey and others radical regional theorists, but transforms their ideas to the contemporary context. The current regional experiments around the world on basic income to address the crisis of wasted labour is an important one to watch. The time is right for regional scholars to move from a celebration of a narrow band of innovative regional growth models to a deeper and more complex reading of the policies and politics implied towards a more just, inclusive and sustainable society. In facing the diabolical double crisis in the economy and the environment,

we need to draw upon our resources as regional scholars and ask ourselves once again, in what sense is this a regional problem? and in turn, to what extent can regional theory be part of the solution.

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## References

- Bauman, Z. (2004). *Wasted lives: Modernity and its outcasts*. Cambridge: Polity.
- Benner, C (2002). *Work in the new economy: Flexible labor markets in Silicon Valley*. Blackwell.
- Benner, C., & K. Neering (2016). *Silicon Valley Technology Industries. Contract workforce assessment. A study with the Everett Program and the University of Santa Cruz*. Retrieved from <http://www.everettprogram.org/main/wp-content/uploads/Contract-Workforce-Assessment.pdf>.
- Benner, C., & Pastor, M. (2013). *Just growth: Inclusion and prosperity in America's metropolitan regions*. Abingdon: Routledge.
- Berg, O. (2016) *Parallax of growth: The philosophy of ecology and economy*. Cambridge: Polity.
- Berger, A. (2007). *Drosscape: Wasting land urban America*. New Jersey: Princeton Architectural Press.
- Berry, M. (2013). *The affluent society revisited*. Oxford: Oxford University Press.
- Berube, A. (2018). *City and metropolitan income inequality data reveal ups and downs through 2016*. Washington, DC: Brookings Institution.
- Blyth, M. (2013). *Austerity: The history of a dangerous idea*. Oxford: Oxford University Press.
- Bossuet, L., 2014. Sustainable electronics: On the trail of reconfigurable computing. *Sustainable Computing: Informatics and Systems*, 4(3), pp.196-202.
- Braun, B., & Castree, N. (Eds.). (2005). *Remaking reality: Nature at the millennium*. Abingdon: Routledge.

- Brown, L. R. (2001). *State of the World, 2001: A Worldwatch Institute Report on progress toward a sustainable society*. WW Norton & Company.
- Brundtland, G. H., & Khalid, M. (1987). *Our common future*. New York: United Nations World Commission on Environment and Development.
- Bulkeley, H., & Newell, P. (2015). *Governing climate change*. Routledge.
- Bulkeley, H., & Betsill, M. M. (2005). *Cities and climate change: Urban sustainability and global environmental governance* (Vol. 4). Psychology Press.
- Carson, R. (1962). *Silent spring*. Houghton Mifflin Harcourt.
- Coenen, L., Benneworth, P., & Truffer, B. (2012). Toward a spatial perspective on sustainability transitions. *Research policy*, 41(6), 968-979.
- Cooke, P., & Morgan, K. (1998). *The associational economy: Firms, regions, and innovation*. Oxford: Oxford University Press.
- Di Tella, R., & MacCulloch, R.J. (2008). Gross national happiness as an answer to the Easterlin Paradox? *Journal of Development Economics*, 86, 22-42, doi: <http://dx.doi.org/10.1787/9789264235120-en>
- Donald, B., Glasmeier, A., Gray, M., & Lobao, L. (2014). Austerity in the city: Economic crisis and urban service decline? *Cambridge Journal of Regions, Economy and Society*, 7(1), 3-15.
- Dorling, D (2011). *Fair play: A Daniel Dorling reader on social justice*. Policy press.
- Dorling, D. (2014). *Inequality and the 1%*. Verso Books.

Dorling, D (2015). Income inequality in the UK: Comparisons with five large Western

European countries and the USA. *Applied Geography*, 61, 1-116.

Eurostat (2017). *Youth unemployment figures 2012-2015*. Retrieved from [http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Youth\\_unemployment\\_figures,\\_2012-2015Q4\\_\(%25\)\\_T1.png](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Youth_unemployment_figures,_2012-2015Q4_(%25)_T1.png).

Florida, R. (2002). *The rise of the creative class, and how it is transforming work, leisure, community and everyday life*. New York : Basic Books.

Florida, R., and Mellander, C. (2016). The geography of inequality: Difference and determinants of wage and income inequality across US metros. *Regional Studies*, 50(1), 79-92.

Galbraith, J.K. (1998) *The affluent society*. 4th edition. Boston: Houghton Mifflin.

Galbraith, J.K. (2015). *The new industrial state* (5th ed.). New Jersey: Princeton University Press.

Galbraith, J.K., (2012). *Inequality and instability: A study of the world economy just before the great crisis*. Oxford: Oxford University Press.

Gertler, M. (1995). 'Being there': Proximity, organization, and culture in the development and adoption of advanced manufacturing technologies. *Economic geography*, 71(1), 1-26.

Gibbs, D. and O'Neill, K., (2017). Future green economies and regional development: A research agenda. *Regional Studies*, 51(1), 161-173.

Gibbs, D., Deutz, P., & Proctor, A. (2005). Industrial ecology and eco-industrial development: A potential paradigm for local and regional development?. *Regional studies*, 39(2), 171-183.

- Gibbs, D., Jonas, A. and While, A., (2002). Changing governance structures and the environment: Economy–environment relations at the local and regional scales. *Journal of Environmental Policy & Planning*, 4(2),123-138.
- Goodman, P. (2016, December 17) Free cash in Finland: Must be jobless. *New York Times*. Retrieved from [https://www.nytimes.com/2016/12/17/business/economy/universal-basic-income-finland.html?\\_r=0](https://www.nytimes.com/2016/12/17/business/economy/universal-basic-income-finland.html?_r=0).
- Gore, A. (2006). *An inconvenient truth: The planetary emergency of global warming and what we can do about it*. Rodale.
- Gray, M., Lobao, L., & Martin, R. (2012). Making space for well-being. *Cambridge Journal of Regions, Economy and Society*, 5(1), 3-13.
- Hadjimichalis, C., & Hudson, R. (2014). Contemporary crisis across Europe and the crisis of regional development theories. *Regional Studies*, 48(1), 208-218.
- Hall, C. A., & Day, J. W. (2009). Revisiting the limits to growth after peak oil. *American Scientist*, 97(3), 230-237.
- Hallegatte, S., Bangalore, M., Bonzanigo, L., Fay, M., Narloch, U., Rozenberg, J., & Vogt-Schilb, A. (2014, November 1). *Climate change and poverty -- an analytical framework*. World Bank Policy Research Working Paper No. 7126.
- Healy, A., & Morgan, K. (2012). Spaces of innovation: Learning, proximity and the ecological turn. *Regional Studies*, 46(8), 1041-1053.
- Herndon, T., Ash, M., & R. Pollin. (2014). Does high public debt consistently stifle economic growth? A critique of Reinhart and Rogoff. *Cambridge Journal of Economics*, 38(2), 257-279.

- Hochschild, A. R. (2003). *The managed heart: Commercialization of human feeling* (2nd ed.). University of California Press.
- Hurley, Amanda K. (2017, April 27). Can Silicon Valley kick the sprawl habit? *CityLab*. Retrieved from <https://www.citylab.com/design/2017/04/can-silicon-valley-kick-the-sprawl-habit/524262/>.
- Ingenious Designs (2017). *Wasted resource*. Retrieved from <http://ingenious.com/the-challenge/green-technology/waste-2/>.
- Intergovernmental Panel on Climate Change. (2016). Retrieved from [www.ipcc.ch](http://www.ipcc.ch), accessed on January 8, 2016.
- Jackson, T. (2009) *Prosperity without growth: Economics for a finite planet*. London: Earthscan.
- Joint Venture Silicon Valley (2017). *Silicon Valley index* (2017). Retrieved from <http://www.jointventure.org/publications/silicon-valley-index>.
- Kitson, M., Martin, R., & Tyler, P. (2011). The geographies of austerity. *Cambridge Journal of Regions, Economy and Society*, 4(3), 289-302.
- Krugman, P. (2013, December 15). Why inequality matters. *New York Times*.
- Lee, N., & Rodríguez-Pose, A. (2016). Is there trickle-down from tech? Poverty, employment, and the high-technology multiplier in US cities. *Annals of the American Association of Geographers*, 106(5), 1114-1134.
- Lovering, J. (1999). Theory led by policy: The inadequacies of the 'new regionalism' (illustrated from the case of Wales). *International Journal of Urban and Regional Research*, 23(2), 379-395.

- Martin, R. (2015). Rebalancing the spatial economy: The challenge for regional theory. *Territory, Politics, Governance*, 3(3), 235-272.
- Martin, R. (2008). National growth versus spatial equality? A cautionary note on the new 'trade-off' thinking in regional policy discourse. *Regional Science Policy & Practice*, 1(1), 3-13.
- Massey, D. (1979). In what sense a regional problem? *Regional Studies*, 13(2), 233-243.
- McDowell, L., & Court, G. (1994). Performing work: Bodily representations in merchant banks. *Environment and Planning D: Society and Space*, 12(6), 727-750.
- McGregor, J.A. & Pouw, N. (2016). Towards an economics of well-being. *Cambridge Journal of Economics*, 41(4), 1123-1142. doi: 10.1093/cje/bew044
- McKibben, B. (1989). *The end of nature*. Random House Incorporated.
- Meadows, D. H., Meadows, D. H., Randers, J., & Behrens III, W. W. (1972). *The limits to growth: A report to the club of Rome*. New York: Universe Books.
- Morgan, K. (1997). The learning region: Institutions, innovation and regional renewal. *Regional Studies*, 41(S1), S147-S159.
- NASA. (2017). Global Climate Change. Vital signs of the planet, climate change evidence, retrieved from [www.climate.nasa.gov](http://www.climate.nasa.gov).
- ONS (Office for National Statistics - UK). (2014). *Self-employed workers in the UK, 2014*. Retrieved from [http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/dcp171776\\_374941.pdf](http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/dcp171776_374941.pdf).

- ONS (Office for National Statistics – UK). (2016). *Contracts that do not guarantee a minimum number of hour, March 2016*. Retrieved from <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningandworkinghours/articles/contractsthatdonotguaranteeaminimumnumberofhours/march2016>.
- Oswald, A.J., & Wu, S., (2011). Well-being across America. *Review of Economics and Statistics*, 93(4), pp.1118-1134.
- Peck, J. (2005). Struggling with the creative class. *International Journal of Urban and Regional Research*, 29(4), 740-770.
- Peck, J. (1996). *Work-place: The social regulation of labor markets*. New York: Guilford Press.
- Perrons, D. (2012). Regional performance and inequality: Linking economic and social development through a capabilities approach. *Cambridge Journal of Regions Economy and Society*, 5 (1), 15-29. doi: 10.1093/cjres/rsr033
- Piketty, T. (2014). *Capital in the twenty-first century*. Cambridge: Harvard University Press.
- Piore, M., & Sabel, C. (1984). *Second industrial divide. Possibilities for prosperity*. New York: Basic Books.
- Pike, A., Rodriguez-Pose, A., & Tomaney, J. (2010). *Handbook of local and regional development* (2nd ed.). Abingdon: Routledge.
- Porter, M. E. (1998). Clusters and the new economics of competition. *Harvard Business Review*, 76(5), 77-90.

- Reinhart, C. M., & K. S. Rogoff. (2010). Growth in a time of debt. *American Economic Review*, 100(2), 573-78.
- Robinson, B. H. (2009). E-waste: An assessment of global production and environmental impacts. *Science of the Total Environment*, 408 (2), 183–191.
- Rodríguez-Pose, A. (2012). Trade and regional inequality. *Economic Geography*, 88(2), 109-136.
- Rodríguez-Pose, A., & Tselios, V. (2009). Mapping regional personal income distribution in Western Europe: Income per capita and inequality. *Czech Journal of Economics and Finance*, 59(1), 41-70.
- Saxenian, A. (1990). Regional networks and the resurgence of Silicon Valley. *California Management Review*, 33(1), 89-112.
- Sayer, A. (2009). Contributive justice and meaningful work. *Res Publica*, 15(1), 1-16.
- Sayer, A., (2015). *Why we can't afford the rich*. Bristol: Policy Press.
- Schor, J. (2010). *Plenitude: The new economics of true wealth*. New York: Penguin Press.
- Scott, A. J. (1999). *Regions and the world economy: The coming shape of global production, competition, and political order*. Oxford: Oxford University Press.
- Skidelsky, R. (2009). *The return of the master*. London: Allen Lane.
- Smith, N. (2016). Silicon-Valley's basic income experiment is worth watching. *Bloomberg*. Retrieved from <https://www.bloomberg.com/view/articles/2016-06-08/silicon-valley-s-basic-income-experiment-is-worth-watching>.

- Stiglitz, J. (2013). *The price of inequality: How today's divided society endangers our future*. New York: W. W Norton & Company.
- Storper, M. (1995). The resurgence of regional economies, ten years later the region as a nexus of untraded interdependencies. *European Urban and Regional Studies*, 2(3), 191-221.
- Truffer, B., & Coenen, L. (2012). Environmental innovation and sustainability transitions in regional studies. *Regional Studies*, 46(1), 1-21.
- Way, R.G., Oliva, F., & Viau, A. E. (2017). Underestimated warming of northern Canada in the Berkeley Earth Temperature Product. *International Journal of Climatology*, 37(4), 1746-1757. Doi 10.1002/joc.4808.
- Whatmore, S. (2002). *Hybrid geographies: Natures cultures spaces*. London: Sage.
- Wilkinson, F. (Ed.). (2013). *The dynamics of labour market segmentation*. Elsevier.
- Wilkinson, R. G., & Pickett, K. (2009). *The spirit level: Why more equal societies almost always do better*. London: Allen Lane.
- World Bank Group (2016). *Digital dividends*. World Development Report. The World Bank Group.