



GRASSROOTS INNOVATION FOR  
SUSTAINABILITY: A NICHE ANALYSIS OF  
COMMUNITY CURRENCIES

Gill Seyfang and Noel Longhurst

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Science, Society and Sustainability (3S) Research Group  
School of Environmental Sciences  
University of East Anglia  
Norwich Research Park  
Norwich NR4 7TJ UK

[info@3S.uea.ac.uk](mailto:info@3S.uea.ac.uk)  
[www.3S.uea.ac.uk](http://www.3S.uea.ac.uk)

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## **GRASSROOTS INNOVATION FOR SUSTAINABILITY: A NICHE ANALYSIS OF COMMUNITY CURRENCIES**

### **ABSTRACT**

Over the last decade, the nascent field of Sustainability Transitions has sought to explain the conditions under which technological innovations can diffuse and disrupt existing socio-technical systems through the successful scaling up of experimental ‘niches’. Building on this pioneering work, recent research on ‘grassroots innovations’ argues that civil society is a promising but under-researched site of innovation for sustainability, albeit one with very different characteristics to the market-based innovations normally considered in the literature. In order to explore the relevance of niche development theories in a civil society context, this paper conducts a niche analysis of a growing grassroots innovation – the international community currency movement. This movement comprises a range of new socio-technical configurations of systems of exchange which have emerged from civil society over the last 30 years, intended to provide more environmentally and socially sustainable forms of money and finance. We draw on new empirical research to investigate the global scope and character of community currencies, using primary and secondary sources, elite interviews and participant observation in the field. Our analysis suggests that many of the conventional niche processes are relevant in a grassroots context. However, existing theories do not fully capture the complexity of this type of innovation, nor does the niche development trajectory appear to follow the same path as that of market based innovations. This indicates a need for further theoretical development in order to understand the processes by which innovation emerges from civil society, and we suggest some possible avenues for future research.

### **KEYWORDS:**

Grassroots innovations, innovation diffusion, innovation niches, social innovation, complementary currencies, community currencies

### **3S STRANDS:**

Transitions to Sustainability, Sustainable Consumption.

## 1 INTRODUCTION

The challenges of sustainable development are increasingly seen as demanding fundamental change and systemic transformation in socio-technical systems (Jackson, 2009; UKERC, 2009). An immediate example of this need for socio-technical transformation is presented by the recent financial crisis, which has focused attention on the need for more sustainable and resilient monetary systems. Fundamental questions are being asked about the suitability of capitalist debt-fuelled economic growth to sustain local economies (Mellor, 2010), and alternative models are sought which go beyond incremental reforms to offer radically different systems of exchange based on greater transparency and democratic control, as well as environmental sustainability (Spratt et al, 2009).

In recognition that systems exhibit 'lock-in' and 'path-dependency', a growing body of research seeks to understand the dynamics and governance of system-wide transformations and social change for sustainability; an academic literature around co-evolutionary systems innovation has emerged which terms these shifts 'sustainability transitions' (Grin et al, 2010). From historical case studies of socio-technical transformations, this work points to the transformative potential of accumulations of experimental projects in 'niche' spaces, as sources of radical (rather than reformist) innovation (Schot et al, 1994). Niches are protected spaces where projects can develop away from the normal selection pressures of mainstream systems, offering supportive networks to allow experimental new systems to take shape, such as business incubators, subsidised technologies, or ecovillages (Smith and Raven, 2012). The transitions literature examines the conditions and characteristics of successful (ie influential) niches. However, most of this research has focused on top-down technological innovation in market settings; in contrast, "the role of consumers and grassroots initiatives in transitions is underrated and under-conceptualised" (Grin et al 2010:331).

There is an increasing interest in harnessing the innovative potential of civil society to address policy objectives (NESTA, 2009; McCarthy, 2010; Mulgan, 2006). The UK Government has recently affirmed its view that "the third sector shapes the future by mobilising and inspiring others [and] the innovation and enthusiasm of civil society is essential in tackling the social, economic and political challenges that the UK faces today" (DEFRA, 2012:2). However, little is known about the conditions required for their success or wider diffusion, or about how these initiatives might be supported to achieve wider influence on mainstream systems. Recent work on 'grassroots innovations' argues that civil society is a promising but under-researched site of innovation for sustainability (Seyfang and Smith, 2007). This work extends the focus of sustainability transitions research to examine predominantly *social*, community-led, values-driven innovations and explore how to harness and diffuse radical community-based action for sustainability (Seyfang, 2009; Seyfang and Haxeltine, 2012; Hielscher et al, 2012; Georg, 1999; Hess, 2007; Avelino and Kunze, 2009). This paper adds directly to the emerging body of research on grassroots innovations, by using the empirical example of community currencies (as a grassroots 'niche') to test the relevance of niche development theories in a civil society context.

Community currencies (CCs) are parallel exchange systems that have emerged from civil society all over the world over the last thirty years (Seyfang and Longhurst, 2012). As part of a longer history of grassroots monetary experimentation (see North 2007), they aim to deliver services and functionality that mainstream money cannot – such as keeping money circulating locally, providing liquidity in cash-poor areas to relieve unemployment and enable people to meet their needs, promoting active citizenship or volunteering, or encouraging greener behaviour (see Slay, 2011 for a review of evidence) and include initiatives such as Time Banks, Local Exchange Trading Schemes, 'trueque' barter markets and city-wide local currencies. These have been attracting increasing policy attention from governments keen to develop sustainable local economies and encourage community engagement – from official government support in Brazil (Melo 2010) to the UK's Big Society agenda encouraging 'reciprocal exchange' and self-help (HM Government, 2011). Previous

academic research has examined CCs as initiatives to: tackle social exclusion and unemployment (Williams et al, 2001; Pearson, 2003; Seyfang 2001b, 2003, 2004); localise economies and improve resilience (Graugaard, 2012; Gregory, 2009); build social capital and civic engagement (Seyfang and Smith, 2002; Collom, 2008); promote sustainable consumption (Briceno and Stagl, 2006; Seyfang 2001a, 2006), and as forms of alternative social movements (North, 2007; Collom, 2011). However, there have been very few examinations of CCs as innovations (Douthwaite (2002) and Longhurst (2012) are rare examples), and this is where our contribution lies.

Community currencies have considerably expanded in number over the last 30 years (Seyfang and Longhurst, 2012; Blanc, 2012). On this basis, combined with their predominant emergence from civil society, coupled with strong values-led drivers and sharing innovative financial sociotechnical configurations, we argue that they can be considered, collectively, as a grassroots innovative niche. Consequently we draw on a range of niche development theories to assess whether these have any purchase in explaining the growth of this civil society niche. In doing so we draw on new empirical research to investigate the global scope and character of CCs, using primary and secondary sources, elite interviews and participant observation in the field.

The paper proceeds as follows: the next section introduces the theoretical context for this research, highlighting the distinctiveness of grassroots innovations. We then present community currencies as an example of such initiatives, explaining their rationale and application, describing our research methodology, and outlining the findings of our empirical study. Next we explore the extent to which niche processes can be discerned in the community currency field. We then discuss the theoretical implications of our findings, and conclude with suggestions for future research into grassroots innovations, along with some policy recommendations for harnessing their potential.

## **2 THEORETICAL CONTEXT**

### **2.1 Sustainability Transitions and Niche Innovations**

The challenge of shifting modern societies to more sustainable development trajectories has prompted a growing academic and policy interest in the governance of socio-technical transitions and sustainable innovations (Grin et al, 2010). This is particularly important when dominant (unsustainable) systems 'lock-in' innovation processes, cannot solve the underlying problems, and exclude alternative visions (Sanne, 2002). A multi-level perspective (MLP) of sociotechnical systems change attempts to explain the dynamic relationships between innovative radical niches, incumbent regimes (dominant systems), and wider landscape pressures (semi-exogenous contexts) (Smith et al, 2005, 2010; Geels, 2002). Historical studies of socio-technical systems transformations have revealed that accumulations of projects in experimental 'niches' have triggered widespread systems-change when those dominant systems have been under tension (Geels and Schot, 2007), and these studies have sought to explain the conditions and processes whereby effective niches might form and influence sustainability transitions in dominant systems.

Sociotechnical niches are defined in various ways in the literature, but a common theme is the 'protected space' where new sociotechnical configurations and practices can be experimented with and develop away from the selection pressures of the dominant regime: "change within the regime tends to be incremental and path-dependent... 'revolutionary' change originates in 'niches'" (Smith et al, 2010: 440). Niches comprise intermediary organisations and actors, which serve as 'global carriers' of best practice, standards, institutionalised learning, and other intermediary resources such as networking and lobbying, which are informed by, and in turn inform concrete projects (experiments) on the ground (Kemp et al, 1998; Geels and Raven, 2006). Within this literature Strategic Niche Management (SNM) has developed as a governance-focused strand of this research, which aims to understand how to proactively create and nurture niches developing desirable

sustainable innovations, with the aim of triggering wider systemic transitions (Hoogma et al 2002; Raven 2005). Under the right regime conditions, successful niches facilitate the diffusion of innovative socio-technical practices and systems, and the theory suggests three ways by which niches can influence the regime: they can enable *replication* of projects within the niche, bringing about aggregative changes through many small initiatives; they can enable constituent projects to *grow in scale* and attract more participants; and they can facilitate the *translation* of niche ideas into mainstream settings.

In the SNM literature, Kemp et al (1998) identify three key processes for successful niche-growth and emergence: managing expectations, building social networks, and learning. Expectation management concerns how niches present themselves to external audiences, and whether they live up to the promises they make about performance and effectiveness. To best support niche emergence, expectations should be widely shared, specific, realistic and achievable; networking activities should embrace many different stakeholders, who draw resources from their organisations to support the niche's emergence; and learning should contribute not only to everyday knowledge and expertise, but also to 'second-order learning' wherein people question the assumptions and constraints of mainstream systems altogether (ibid). These three processes are, of course, interdependent, and constitute a dynamic niche-development trajectory whereby learning leads to higher expectations of functionality, thereby enrolling new actors and resources, and so on, in either virtuous or vicious cycles (Raven 2007).

A key empirical question has been how the niche level activity builds on the experience of local experiments, and manifests these learning mechanisms, which in turn support and shape multiple, diverse local projects, and help new projects to form. Building on SNM, it has been suggested that this involves aggregation activities that include:

standardisation, codification, model building, formulation of best practice, etc. Also circulation of knowledge and actors is important, to enable comparison between local practices and formulation of generic lessons: conferences, workshops, technical journals, proceedings, newsletters play a role too.

(Geels and Raven 2006, 378)

This work suggests that the processes of managing expectations, building networks and learning happen not only at the localised level but also at a more abstract 'global' level. Geels and Raven (2006, 390) suggest that at this level visions and expectations about the functionality of innovations are particularly important. As such, Geels and Deuten (2006) suggest that this 'hidden work' of niche-building consists of three crucial elements: the creation of social networks and a sense of community; intermediary actors who speak for the field, and do the socio-cognitive work of knowledge aggregation, and finally the creation of a knowledge infrastructure to enable knowledge flows. They identify four stages of global niche-formation. The first *local* phase sees a high diversity of practices in projects acting independently on the basis of local knowledge. The second *inter-local* phase sees proprietary networks circulating some knowledge, and limited attempts to network and promote common standards. Third, a *trans-local* phase sees increasing demands for greater quality, standards and comparability driving shared standards, knowledge-sharing and the growth of collective interests in creating a shared field of activity. Intermediary actors play a role here in developing these common interests and managing external expectations. Finally, a *global* phase sees greater institutionalisation and standardisation of practices in the field, eg through training, courses etc, with niche standards shaping local practices, and therefore becoming a stable regime. Niche aggregation often depends on the work of intermediaries, who manage the flow of information between different 'levels' (Geels and Deuten 2006).

The broadening of analysis beyond individual projects and small localised niches has raised questions about the extent to which niche processes themselves are sufficient to lead to the emergence of new technologies and the transitioning of socio-technical systems (Hoogma et al 2002; Raven 2005; Smith et al 2005). For example, Geels and Raven (2006, 390) suggest that

the niche perspective is not sufficient, because it only highlights internal niche processes. For a complete understanding of non-linearity and changes in expectations, we need to include external (regime and competitive niche) developments.

As Geels and Deuten (2006) note, real-world niche formation begins not with a clean slate but with pre-existing allegiances, commitments and communities of interest. The interaction between niche, regime and landscape is a feature of many of the historical case studies that have operationalised the Multi-Level Perspective (e.g. Geels 2005, 2006), and have also been considered in recent work on Transition Pathways. This work identifies a range of ideal type possible trajectories and outcomes for niche innovations, dependent on different possible patterns of interaction between niches, regimes and landscapes: “Niche innovations in an embryonic state do not pose a threat to the regime. At some point, external landscape developments may create pressure on the regime and create windows of opportunity for transitions” (Geels and Schot, 2010:54). Niche innovations might be a source of synergistic reforms to be absorbed into regimes; they might compete with and potentially displace the regime; might expand and work alongside a regime without changing it fundamentally; or could expand to fill a void caused by a regime collapse (Geels and Schot, 2010). Importantly, radical niches need not aim to displace the regime, their aim might be to play a more significant role alongside it, or offer new ideas for incorporation into existing systems – but this work does highlight the importance of regime destabilization and landscape pressure in creating space for innovative niches to scale up.

## **2.2 Grassroots Innovations**

To date, this body of research on Sustainability Transitions has been applied to cases of principally technological innovation, in market settings. We turn now to the context of civil society, and social innovation. Seyfang and Smith (2007) argue that community action is a promising but neglected site of innovation for sustainability, and recent work on ‘grassroots innovations’ addresses this deficit, extending niche innovation analyses into civil society contexts (eg Hielscher et al, 2013; Seyfang and Haxeltine, 2012; Witkamp et al, 2010; Smith, 2007; Seyfang, 2009; Georg, 1999; Hess, 2007; Avelino and Kunze, 2009). Grassroots innovations are defined as:

“innovative networks of activists and organisations that lead bottom-up solutions for sustainable development; solutions that respond to the local situation and the interests and values of the communities involved. In contrast to the greening of mainstream business, grassroots initiatives tend to operate in civil society arenas and involve committed activists who experiment with social innovations as well as using greener technologies and techniques” (Seyfang and Smith, 2007: 585).

They include initiatives such as alternative food networks, community energy projects, furniture-recycling schemes, co-housing, ecovillages, low-impact development, Transition Towns, local currencies and so on (Church and Elster, 2002). Importantly, grassroots innovations go beyond individualistic reforms, and seek to build new systems of provision, on the basis of deep green sustainability visions, and collective endeavour and interests (Seyfang, 2009). The distinctive characteristics of grassroots innovations have implications for practice and theory, and we already know something about the ways in which grassroots innovations differ from technological, market-based niches. Grassroots innovations are based in the social economy (rather than the market economy); they tend to focus on social and institutional innovation (rather than technological); they

are driven by social need and ideological commitment (rather than profit-seeking); the 'protected space' which supports their development is often one of alternative values and culture (rather than market regulation and subsidies); they are constituted by diverse organisational forms such as cooperatives, voluntary associations, and informal community groups (rather than firms), and they rely on grant funding, volunteer labour, mutual exchange and only limited commercial activity (rather than principally commercial income) (Seyfang and Smith, 2007:592).

The benefits of grassroots innovations for sustainable development derive principally from their creation of a space for the development of new ideas and practices, for experimenting with new systems of provision, and for enabling people to express their 'alternative' green and socially progressive values, and from the tangible achievement of environmental and social sustainability improvements, albeit on a small scale (Seyfang and Smith, 2007). Conversely, the main challenges faced by grassroots innovations are related to the struggle to maintain a viable sustainable socio-technical space within a wider unsustainable regime. This translates into issues around securing funding, which in turn affects possibilities for institutionalisation and consolidating learning, managing organisational change, making effective links and networks with other societal actors, and diffusing oppositional ideas into wider society (Seyfang, 2009; Smith, 2006, 2007; Hielscher et al, 2012; Seyfang and Haxeltine, 2012).

Despite the increasing body of work which contributes to the understanding of niche development processes described above, there has been little exploration of the processes of niche formation and growth in the context of grassroots innovations, nor on the ways in which niches might seek to gain wider influence on regimes (Smith, 2007 and Hielscher et al, 2012 are rare exceptions). Additionally, traditional analyses have focused on national case studies of particular technologies. Thus, the literature has mainly considered supply-side, technological innovations in market settings, neglecting consumption-focussed social innovation in civil society (Grin et al, 2010). This paper therefore seeks to address this gap by exploring how niche development processes occur within an *international grassroots innovation* movement, using the empirical case of community currencies.

### **3 COMMUNITY CURRENCIES: GRASSROOTS INNOVATIONS FOR SUSTAINABLE DEVELOPMENT**

The field of community currencies has grown considerably over the last 30 years, both in absolute terms and in terms of the diversity of currency 'types' (Seyfang and Longhurst, 2012; Blanc, 2012). These currencies have emerged from grassroots communities for a range of reasons. Many have been initiated as a response to a perceived failure (and inability) of modern monetary systems to deliver sustainable development, increasing numbers of grassroots activists are experimenting with novel forms of money and systems of exchange. Examples include Local Exchange Trading Schemes (LETS), Time Banks, and local currencies such as the Brixton Pound; a vast diversity of different projects exist, but they share a goal of realigning the incentives and infrastructure of exchange towards sustainable development, through variously: economic localisation, equitable working structures, inclusive access to financial services, building social capital and cohesion, promoting sustainable consumption, and encouraging active citizenship (Kent, 2005; Greco, 2001; Robertson, 1999; Douthwaite, 1996; Lietaer, 2001). We can therefore describe the CC as an example of a grassroots innovation, whose niche protection lies in the form of cultural values and ideologies oriented around an ecological critique of the existing monetary system and a vision of how the rules can be different. The goal of these projects is not necessarily to replace the existing money system, but more commonly to live alongside it, offering a complementary system of exchange while potentially influencing wider framings and perhaps shifting the regime incrementally.

In order to examine the niche processes occurring within the currency field, we undertook a global scoping study of the scope, nature, objectives and development of major sustainability-focussed CCs (see Seyfang and Longhurst, 2012). We drew on successful pre-existing working relationships inside

the currency movement to access the latest information and further contacts from elite sources, and we consulted existing empirical studies of CCs, CC practitioner literature, leading CC developers at an international workshop convened to share current knowledge and experience between CC groups, our advisory panel of CC academic and practitioner experts, and finally, we published a special issue of the International Journal of Community Currency Research (Longhurst and Seyfang, 2011). We examined the prevalence of different CC types and their spread and development over time, and looked for evidence of niche-formation processes at work. A significant difficulty we encountered was the lack of reliable, up-to-date information on CCs, even from national or international CC network websites, and our analysis is based on the best quality information we could find. This necessarily includes claims made by key CC practitioners, and we have, where possible, sought triangulation to test their validity.

Our scoping study sought to uncover the types of CC activity taking place across the world. Looking first at established CC movements (i.e. with 5 or more of a CC type in a country), we identified a total of 39 nationally-based currency groupings, in 23 countries, across six continents, representing a total of 3418 local projects (see Seyfang and Longhurst 2012 for a full analysis). These were categorised into four principal CC types (which simplifies the complexity of multiple local practices and objectives):

- *Service Credits* (50.2% of the projects) such as Time Banks/Time Dollars aim to build social capital, inclusion and cohesion by rewarding neighbourly support, social care and community-based activities. Participants earn a time credit for each hour spent helping someone – these credits can be saved up for future use, donated to someone else, or spent receiving services from other members.
- *Mutual Exchange* (41.3%) currencies such as Local Exchange Trading Scheme (LETS) are issued by users' spending: one person's credit equals another's debit to the system, accounts always sum to zero and the value of the currency is maintained by trust in other members to meet their commitments. LETS aims to be a general purpose money within a defined geographical area, offering additional liquidity, access to interest-free credit and encouraging import substitution.
- *Local Currencies* (7.1%) are geographically-bounded, backed currencies which circulate locally, increasing the local economic multiplier and supporting local businesses. Some are convertible to national currency, forming 'local exchange vouchers' redeemable only with participating businesses. Notable examples include the US Ithaca Hours, German Regiogeld, UK Transition currencies and Brazilian Community Banks.
- *Barter Markets* (1.4%) were first instigated in Argentina and expanded rapidly during their financial collapse. Individuals are issued with local 'creditos' as an interest-free loan. These are non-convertible and are used to trade at regular markets. The Argentine networks have since declined, but in Venezuela and Mexico it has become closely associated with the solidarity economy, and in Quebec, Canada, with an environmental (re-use) focus.

The geographical diffusion of CC types, over time, is evident. Particular models e.g. LETS or Time Banks have spread around the world and been implemented with local variations in different contexts. Europe is the CC hub of the world, with 2333 projects out of 3418 (68.3% of the world's total), followed by Asia (16.6%), North America (9.8%), South America (2.7%), Australia and New Zealand (1.7%) and Africa (0.9%). Examining the status of the national movements of CCs, the majority (55.3%) of the 39 national networks identified were growing in terms of numbers of local

projects, 15.8% were stable, and 28.9% were declining. There is a lifecycle element to this picture: the *growing* CC national types are notably more recently-established (averaging 12.5 years) than the *stable* (14.5 years) and *declining* systems (17.8 years).

Having reviewed the state of the global CC movement, and identified a diverse set of experimental practices in local projects, the next section explores the extent to which niche development processes can be observed in this growing network of projects.

#### 4 COMMUNITY CURRENCIES: A NICHE ANALYSIS

We here consider the evidence for niche-building activities in the CC field, according to the theories of niche development outlined previously. We examine processes of learning, networking and expectation-management in turn, and then consider the role of regime and landscape pressures on CC development.

##### 4.1. Learning

Niche theory predicts that building successful niches requires both first and second-order learning, and that in order to build on the experience of multiple local projects, knowledge-aggregation work is required. To what extent is this seen in the CC field? Our research suggests that a particular problem that currency projects face is accessing resources to codify and consolidate even first-order learning. The resource-scarce, grassroots nature of many projects means that much of the tacit learning is only shared informally amongst activists or colleagues and is not often captured. However, one type of learning that *is* captured is project evaluations, particularly where the currency has been in receipt of either foundation or public money. Yet, this knowledge production rarely attends to the multiple objectives of CCs, and measurement of impacts tends to conform to the goals of project funders and their view of what counts as ‘success’. For instance, a time bank might view a successful outcome in terms of engaging with marginalised people, rather than the volume of hours exchanged, and the way that ‘success’ is defined has implications for how these initiatives are perceived both within and outside the niche (Seyfang, 2006). Consequently, such forms of evaluation are often instrumental in that they evaluate success of the currency project in delivering an agreed set of functions (e.g. Slay 2011). Rarely do such evaluations specifically focus on generating knowledge about the currency project *itself*. Other actors, as discussed below, usually undertake such second-order learning.

##### 4.1.2 Role of Intermediary actors

We found several sets of intermediary actors working to aggregate knowledge in the CC niche, operating in different ways and fulfilling different roles. National networking organisations have emerged in some contexts and these can play an important role in collating lessons, conducting research, developing new standards and best practice, and then providing materials to support existing projects and facilitate their replication. This can include computer software, ‘how to’ guides, template forms and advice on overcoming common problems. They therefore act as knowledge aggregators, deriving decontextualised, generic lessons for circulation, and in some cases standardising framings for local practice. Other organisations such as think tanks and policy advisory bodies can represent CCs externally, and attempt to influence public discourse through their publications. For example, NESTA and the New Economics Foundation state their aim is “to get smarter at drawing down and sharing lessons from individual projects, to find ways of replicating the key features of co-production [e.g. time banking], and to improve the conditions for scaling.” (Boyle et al, 2010:13)

Currency pioneers have also become key intermediaries in the growth of the wider movement. Examples include Michael Linton (LETS), Paul Glover (Ithaca Hours), Edgar Cahn (time banks) or João Joaquim de Melo Neto (Banco Palmas). Another group of intermediaries are writers who have published widely on the topic of complementary currencies and in many cases could be considered as writer-activists, people such as Bernard Lietaer, Tom Greco, David Boyle and Margrit Kennedy. For example, Guy Dauncey's (1988) *After the Crash* was significant in popularising LETS in the UK. Such writers are not only responsible for the dissemination of currency knowledge through their publications but also through public speaking engagements, physically carrying knowledge from one country to another.<sup>1</sup> Many of these lectures are arranged through 'green' and new economic networks. Television documentaries can also prompt currency experimentation such as the Ende's Money-go Round (1999) documentary that inspired a currency boom in Japan (Hirota, 2011) and the *Jetons de Bonheur* systems in Quebec. However, media coverage can also have the opposite effect, with a critical television documentary implicated in the collapse in confidence in the Argentinian Truque barter systems in 2002 (North, 2007). In addition there are a handful of key global networking individuals who also act as intermediaries, translating documents, collating evidence and reports, and providing links between currency systems.

A number of other actors participate in the knowledge-aggregation activities within the global currency niche. Specialist organisations working in the currency field include: the Dutch NGO *Strohalm* (STRO) with more than two decades experience and particular expertise in South America; *Value for People* who deliver training for currency activists; and QOIN, a consultancy firm with expertise in translating CC models to NGO, commercial and local government settings. Academics who research CCs also produce knowledge about the field. For example, as part of this research, we convened an international workshop on CC innovations, bringing together leading figures from a variety of CC movements and we published a special issue of the International Journal of Community Currency Research (IJCCR) on the latest developments in the field, so in turn contributing to the learning and knowledge-sharing within the movement.

The importance of these intermediary activities is brought home when one considers that the codification of knowledge does not necessarily guarantee the diffusion of projects. In the context of the UK LETS movement there was conflict in the 1990s between the LETSsystem model promoted by the founder of LETS, Michael Linton, and the more flexible LETS scheme promoted by the intermediary LETSLink. Linton's vision was to produce a fixed technical specification for a CC that could be applied anywhere, and should be followed precisely. He assumed that the production of technical knowledge was sufficient for it to diffuse. On the other hand, LETSlink favoured a flexible, locally-adapted model that incorporated contextual factors and objectives, and evolved into new forms, and attended to community-building as the basis of the CC. This latter model spread further and into a broader range of contexts. It is noteworthy then, that the abstraction and circulation of knowledge itself appears insufficient to spread niche practices. Rather, as these niche practices are themselves deeply embedded in local socio-economic contexts, the knowledge needs to be *recontextualised* before it can be robustly applied, and this demands intensive work by intermediaries – which is difficult in under-resourced institutions, thereby limiting the spread of ideas and practices.

#### 4.1.2 Building knowledge infrastructure

There are a number of structures that allow the circulation of currency knowledge, and which originate with or build on the networks and intermediaries discussed above. Periodic academic and

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<sup>1</sup> For example, see Longhurst (2012) for details of how a public lecture by Bernard Lietaer inspired the Totnes Pound currency in the UK.

NGO-led conferences bring together activists and academics to review and report recent developments e.g. the 2007 European Monetary Regionalisation conference ([www.monetary-regionalisation.de](http://www.monetary-regionalisation.de)), the CC-Conf (International Conference on Community and Complementary Currencies, Lyons, 2011) and the First International Social Transformation Conference with a theme of "energy money" ([www.teslaconference.com](http://www.teslaconference.com)). Email lists and Skype groups provide a virtual space where discussions are held. Various actors collaborate to develop and uphold key resources for the field such as the online database and resource bank which claims to be "at the center of a network of community developers, social entrepreneurs, researchers, writers, authors, academics and students working on complementary currency systems to improve the lives of the people and the economy around them" ([www.complementarycurrency.org](http://www.complementarycurrency.org)); the Complementary Currency Magazine ([www.ccmag.net](http://www.ccmag.net)), a bibliographic database and library ([www.cc-literature.de](http://www.cc-literature.de)) and the International Journal of Community Currency Research ([www.ijccr.net](http://www.ijccr.net)). All of these platforms facilitate the circulation of currency related knowledge, and volunteers provide many of them.

#### **4.2 Network Building**

Niche theory predicts that growing niches depend on expansion of networks and network building activities, both internally (building a sense of community to encourage information-sharing) and externally (to attract resources and influence). We found evidence of both types of network-building taking place at a range of scales. The international currency niche is supported by a range of broader networks that promote complementary currencies for different reasons. Many 'new economics' think tanks and NGOs within the green movement have been at the forefront of currency experimentation over the last 30 years, for example the New Economics Foundation (UK), Strohalm (the Netherlands), The Schumacher Society (USA), SANE (South Africa) and Living Economies (New Zealand). These organisations have not only promoted the 'technology' of currencies amongst their own networks but also as part of wider international new economic and heterodox networks. In several cases it is these networks and actors that are responsible for the initial 'importing' of a currency model or experiment.

Other networks that also have sympathy with CCs and provide resources to support their growth, include environmentalist networks such as the Transition Town movement (which has spawned its own model of local currency in the UK), solidarity economy movements such as ALOE (Alliance for a Responsible, Plural and Solidarity Economy) which funded an international workgroup to develop high-level CC learning and leadership, monetary reform campaigns, cyber libertarianism / open source movements, and the growing community around 'peer-to-peer' collaborative consumption (e.g. Botsman and Rogers, 2010). Each of these contributes to niche-development processes by enrolling actors, providing resources, and distributing knowledge. NGOs have also played a key role in the growth of the global currency niche, responsible for the instigation of new experiments or 'importing' models, having the ability to attract resources to the niche. For example, the first Argentinian Truque (barter) system was set up by an environmental NGO (Pearson, 2003). Similarly, when Time Banking was first introduced to the UK, it was through an alliance between the New Economics Foundation and The King's Fund (a health charity) in order to strategically position the CC as a tool for improving health service provision.

We also found evidence of considerable *formal* and *informal internal* networking within the niche. As noted above, in several cases, national networking organisations have arisen which fulfil multiple roles including supporting new projects, lobbying and acting as the hub of system-based networks, e.g. Time Banks UK, the German Regiogeld Network, or LETSLink UK. These network organisations often emerge from a proliferation of projects within a specific country and contribute to the further diffusion of the particular type.

National networks fulfil a number of networking functions which support niche development. Firstly they actively build and manage networks of local projects, providing support to new projects. For example, Time Banking UK's mission is to "create an environment in which timebanking can flourish [...] firstly we build and support the infrastructure for time banking [...] secondly we build the appetite for timebanking" (Time Banking UK 2011: 6). Time Banking UK seeks to achieve the latter aim by researching and proving the concept, and then by engaging with policy debates around the Big Society, so aiming to translate niche ideas into regime-relevant solutions. This points to a second key function – building networks and engaging with regime actors. An example is the UK LETSLink network working with policymakers to lobby parliament to change the welfare benefits regulations in favour of unemployed people working on LETS (this was ultimately unsuccessful). Other national networks have successfully linked with banking partners (Regiogeld), large commercial banks (Banco Palmas), and local government and business associations (UK Transition Currencies). National networks are also active in attempting to secure resources from funding agencies and charities to support niche-level activities as well as local projects. E.g. the New Economics Foundation and Transition Network won funding from the Tudor Trust to support the development of 'Transition Currencies 2.0' electronic currency platforms.

Whilst national currency organisations play an important role in building the international currency niche it is notable that there can also be conflict between national networks of different CC types, for various reasons including ideological conflicts, and perceived competition for scarce resources; for instance, tensions existed between LETS and Time Banks in the UK. Perhaps for this reason, established multi-system national networks do not appear to be common. Similarly, at the time of our fieldwork there were few established, formalised, international currency networks (Time Banks USA extending outside its national base is one example). However, we observe a range of overlapping *informal* international networks that contribute to the sense of community among actors in the field. These take a number of different forms, for example a Skype list, academic mailing lists and the personal networks of activists and intermediaries.

### 4.3 Managing Expectations

The literature on strategic niche management suggests that creating shared, robust visions and expectations both within a niche (for recruiting participants) and with external actors (for providing support) is crucial for the continued growth of niche practices, yet this can be problematic when experimental practices are being developed and performance is sub-optimal. This tension has been captured in some of the work on 'promise-requirement' and 'hype-disappointment' cycles (e.g. Verbong et al 2008) and has been noted within the academic literature on currencies (Aldridge and Patterson, 2002; Stott and Hodges 1996). Our data also suggests that expectation management is a significant part of the currency development process. One currency developer felt that managing the expectations of stakeholders was one of the biggest challenges facing currency projects:

Its very challenging because people have expectations that are quite often unrealistic and that is a big part of managing the project successfully and that is really difficult. My role is strategic development and stakeholder relations. I talk to them as often as I can...

However, another interviewee felt the initial over-hyping was a necessary step in enrolling users at the project level in the first instance:

You have to inspire these people and tell them how there's something different that they can do, that they can do it themselves with the help of everybody in the community and you don't inspire people by managing expectations...If you don't inspire people, you're not going to get anything done.

A number of CC projects have charismatic activists as lead ‘articulators’ who draw on existing reputational capital to bring credibility to a particular scheme. For example, two high profile Japanese men Tsutomu Hotta (a politician) and Keiichi Takahata (a businessman) were responsible for successfully establishing Japanese service credit systems in the early 1990s. Similarly, the well-known inventor Heinz Wolf is involved in a new service credit scheme (Care4Care) in the UK and his profile has enabled him to access the media and policy actors. The claims making skills and their strong social networks of such advocates may play a role in the initial success of certain schemes. However, as the above quote suggests, there is, over time, a need to manage the expectations of currency users. Currency projects (like other forms of grassroots innovation) can be understood as attempts to manage a range of different stakeholder group expectations about the ability of the currency to fulfil different functions (Longhurst 2012). Different user or supporter groups may have different expectations about what the currency can do for them. In order to maintain and develop the project the currency activists or managers need to be able to balance these different expectations at the project level whilst also seeking to draw in new actors; this process can be problematic if there are strong differences between different groups, for instance between those who see CCs themselves as a radical (perhaps anti-capitalist) new monetary system, and those who see CCs as useful solutions for particular regime problems. Such disagreements can cause serious problems in the management of networks and systems, such as in the case of the Argentinian Truque where there were at least two factions which had very different visions over the purpose of barter currency.

Such tensions can also be observed at higher levels of niche development where intermediaries and national networks make claims about the ability of specific CCs to address social, economic and environmental problems. One national network leader acknowledged the problem that such claims can bring for projects on the ground:

One of the things that [the CCs] said to us first when we did a consultation with them 6, 7 years ago was ‘stop getting carried away with the hype’. As a central organisation we were out there claiming that we were going to change the world which you have to do, you have to present a hyped up version of what is going on and all these stories...

At this level the claims are to enrol external actors (policymakers, funders) to support the niche. However, the need to ‘sell’ the innovation to potential supporters can create pressure at the project level. As SNM predicts, the management of such expectations becomes a critical factor on maintaining the flow of resources. One currency developer who received funding from policy networks provides a contemporary example:

Because of the interest and the funding [...] we are feeling a huge expectation about what can be delivered...As an organisation I think that managing expectations of central government and funders is more difficult than it has ever been, partly because they are so excited about it [...] this is obviously really, really, good but it is a double edged sword I think.

These claims making activities are therefore productive for niche growth when they correspond with particular policy agendas. However, currency movements can also falter when there is a failure to meet the policy expectations that are being raised. For example, the growth of LETS in the UK was at least partly curtailed by its failure to meet policy expectations as a tool to address economic deprivation (Seyfang, 2002). In contrast, UK time banking has been successful in engaging with a range of different social policy regimes (education, health, youth work, criminal justice, community development). This ability to engage with a range of different policy fields could be considered a grassroots form of niche ‘branching’ (see Raven 2007).

We observe the process of developing shared, robust expectations through an evolution of the way in which CCs are presented to the wider world. The claims made by currency systems evolve and adapt over time, both within a specific project and within wider currency types. For example, the first Transition currency – the Totnes Pound – was very closely linked with the emergence of the Transition Town movement (e.g. see Hopkins 2008; Longhurst 2010); it shared a website with Transition Town Totnes and adopted a discourse around economic localisation – still a fairly radical economic development approach (e.g. see Hines 2000; Douthwaite 1996). This can be contrasted with the most recent Transition currency, the Bristol Pound. Its website contains no mention of economic localisation nor its connections to the Transition Towns social movement. Instead the claims relate primarily to support for Bristol and local small businesses. This more mainstream presentation of the project appears to be a conscious effort to broaden the appeal of the currency and make claims that are not directly associated with a more radical green agenda, and which are more achievable and realistic.

#### **4.4 Interactions with regimes and landscape**

Our study reveals that understanding the policy context within which this niche-building occurs, is absolutely critical as it explains so much of what is happening – both in terms of looking for opportunities to exploit cracks in the regime, but also in terms of the ways in which niches attempt to influence regimes (Smith 2007; Seyfang and Haxeltine, 2012). The current financial crisis represents a striking example of a financial regime buckling under the weight of its own contradictions and inherent unsustainabilities – consequently prompting a surge in interest in alternatives to national currencies (Sotiropoulou 2011).

We find significant and sustained examples of niche growth where resources are directed towards currency initiatives through alignment with policy objectives. For example, the Banco Palmas community banking model in Brazil benefited in the mid 2000s from a policy agenda that was looking for a flagship Solidarity Economy project to support, while corporate banks were being pressed to find community-based partners through which to offer correspondence banking services. Each of these factors played a significant role in the spread of the Palmas model. Similarly in the UK, both the New Labour *Third Way* agenda and the Big Society concept of the Conservative-Liberal Democrat coalition government have opened political windows of opportunity for currency networks (LETS and time banking respectively). These are the consequence of both landscape pressures (recession and austerity) and the extent to which new solutions are being sought for regime crises or problems.

Historically, we observe periods of currency flourishing at times of economic and social crisis such as during the Great Depression and the Argentine economic collapse of the early 2000s (North 2007). There is evidence of a new wave of currency activism and experimentation in response to the ongoing global economic crisis and the austerity policies it has engendered: new exchange systems are emerging in countries such as Spain and Greece (Sotiropoulou 2011) and in the UK where there is policy interest in community-led alternatives to public service provision through the Big Society policy agenda (Boyle 2011). This, when combined with lobbying and other visible examples can have a powerful effect, as one currency developer explains:

The policy climate has been right. People are being forced to think about new ways of using limited resources. I think that there has been a fair amount of lobbying too. [...] There appears to be an opening at higher policy level for talking about these kinds of projects. NESTA got on the back of it and have pushed it all over the place. It has been a mixture of

things. The change of government, they got into power and ... were looking for ideas around the Big Society... all those strands have come together at the same time.

Currency activists often work opportunistically to exploit the windows of opportunity that are created by particular regime problems and crises, aligning with a particular policy agenda can lead to resource flows in favour of niche development. However, the risk associated with this is that such resources can easily be diverted away should the policy agenda move on or should the currency model fail to deliver on the expectations of functionality that have been raised with policy makers. A loss of resources can lead to intermediary organisations struggling to fulfil their aggregation roles to consolidate and transmit knowledge. In addition, more radical currency models – which rely on either volunteers or funding from foundations and trusts and do not wish to align with policy agendas – tend to struggle over the longer term, although this does not preclude the possibility of successful projects.

#### **4.5 Summary: Niche development in the currency field**

We have explored the extent to which different niche processes could be discerned within the growing field of community currencies. In summary a number of interesting observations can be made. Looking first at the original SNM processes of learning, networking and managing expectations, it is evident that all three processes were taking place. However, what is notable is that the learning capacity of many currency developers is weak at best. In most cases the learning is informal and tacit. With the exception of a small body of academic research, formalised learning tends to take the form of evaluations that seek to assess the impact of currencies, rather than provide a more reflective analysis of their own design and performance. It is therefore notable that the currency niche has developed without the existence of a strong knowledge base or evidence of significant second order learning. Whether it would have developed further had these functions been met is a counter-factual that is difficult to answer. Networking has clearly been significant in the international spread of systems and in the development of 'national types' within specific countries. In the case of the latter, it is clear that the ability of currency activists to enrol state / regime actors in support of a specific currency model can be critical in securing support and resources for that model and help to stimulate its diffusion. Related to this the management of expectations, of funders, partners and users, also emerges as an important factor in the development of particular system types. The same tensions appear to exist between the management of functionality and the need to 'hype' the innovation to attract support in this field as in other more conventional areas of technology and innovation.

In terms of niche aggregation it is at the level of 'national type' that we see the processes most closely associated with the work of Geels and Raven (2006) and Geels and Deuten (2006). Here, a functioning and resourced national body can play a significant role in building networks, aggregating knowledge, supporting new projects and building relationships with regime actors. However, beyond this the processes are more diffuse and informal reflecting forms of knowledge exchange. Whilst some Internet resources do exist, attempts to build an international level of formalised aggregation and networking have, to date, failed. However, that is not to underplay the importance of intermediaries in the general growth of the international CC niche. In addition to the national networking bodies, other key intermediaries include NGOs (often of a 'new economics' inclination), 'inspirational' currency pioneers and the media.

Finally, there is evidence that wider contexts are critical. Whilst it difficult to find examples of a currency innovation that have led to regime transformation, there are clear examples of regime crises and landscape pressures creating opportunities for niche currency innovations to attract resources, support and engagement from regime actors. This particular example of grassroots innovation therefore supports the argument that the characteristics of the innovation are not in

themselves enough to guarantee the diffusion of the innovation. However, this particular case also challenges a number of the theoretical assumptions surrounding the development of innovative niches which emerge predominately from civil society. These are set out in the next section.

## 5 DISCUSSION: UNDERSTANDING THE TRAJECTORIES OF GRASSROOTS NICHES

The preceding section explored the extent to which sustainability transitions theory can explain the growth of an international community currency niche. This section builds on that analysis to draw out some key theoretical implications for niche theories in relation to grassroots innovations. In particular it highlights how the empirical complexity of this particular grassroots niche problematises some of the theory on niche development.

### 5.1. Fractal niches: multiple and nested levels of niche activity

Niches are analytical categories rather than ontological realities, and the unit of analysis can be focused at whichever level is most relevant for any given analysis. Based on the argument that they are all developing similar forms of ‘technology’, this paper has suggested that an international community currency niche can be discerned. However, rather than existing at two levels, our work suggests that it is operating at least four. This is depicted in Figure 2, which illustrates the point in terms of just two of the four principal types of CC model (for clarity). The diagram shows four different ‘levels’ of niche activity taking place, and complexifies the global niche/local project dualism that is prevalent within conventional niche theory. This overall structure could be characterised as one of *fractal niches*, with distinct (but overlapping) sets of actors and different types of niche-building work being carried out at each level, and with varying consequences for movement growth and innovation diffusion.

It shows the highest level of ‘global’ niche represents the international, multi-CC type niche. At this level, we see the work of international intermediaries and knowledge structures actors such as the IJCCR and CC resource centre, sharing knowledge about various CC types and strategies – but crucially, not being involved in direct support for CC projects.

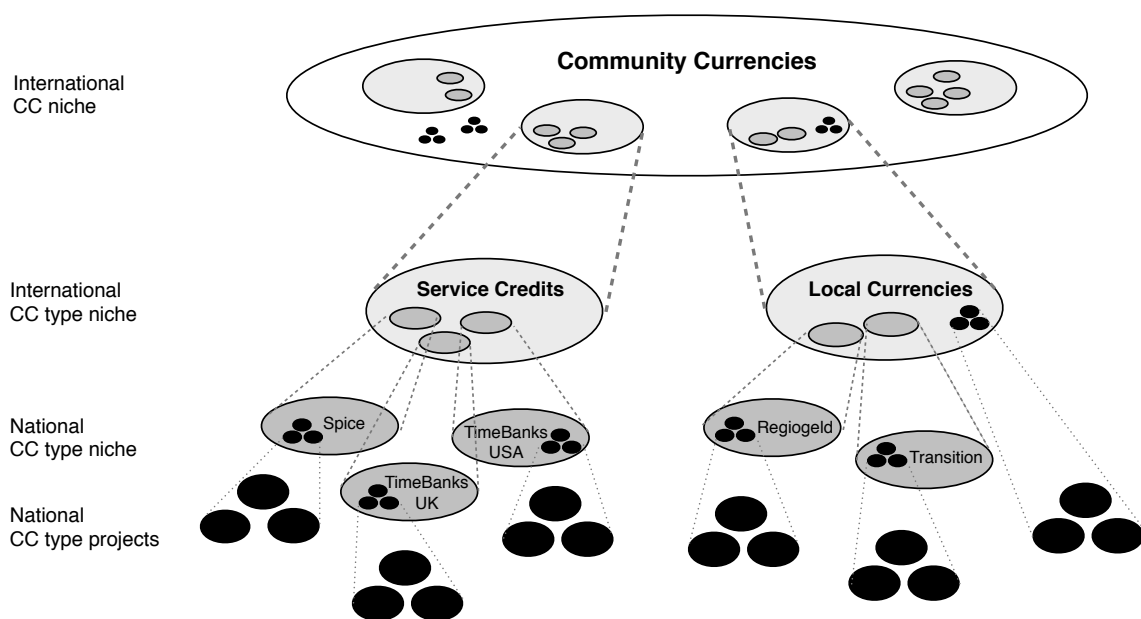


Figure 2: The community currency field, displaying fractal niches

This second level represents international networking by CC type, exemplified here by Service Credits schemes and Local Currencies. Arguably this is the least institutionalised of the niche levels, with little evidence of formal structures or institutions. There have been some attempts at building formal relationships (e.g. between Time banks UK and USA) but most relationships at this level appear to be informal and periodic, for example, between different barter systems in South America or LETS in Europe. Collaboration at this level appears to be primarily funding-driven, such as the 'importing' of LETS into Hungary, funded by the British Council (Jelínek et al 2011).

As discussed in Section four, the national level is where we see significant aggregation processes, particularly where national networking organisations have been able to establish themselves. Arguably, regime engagement is strongest at this level, with national policy actors and NGOs helping to translate CCs into policy-relevant forms. In turn, these national niches are aggregations of learning and experience of multiple local CC projects. Whilst it is possible to 'see' these different levels of activity analytically, in practice the picture is far more complex with actors working across the multiple levels.

We therefore conclude that the literature on niche-formation processes is over-simplified for the civil society context where niche boundaries are not clear-cut and where fractal niches are an inevitable outcome of different social movements mobilising around innovative technologies, and intermediary actors are influential from the beginning. In contrast with some of the previous niche literature, these innovations don't come fresh from a laboratory, they are embedded within social movements and cultural contexts with long antecedents. On the basis of this empirical exploration, This suggests a need to examine processes at different levels as well as the interactions between different levels. However, this has implications for the scope of empirical enquiries, suggesting that there are multiple issues relating to the bounding of cases. Case selection is an issue that has already been raised within sustainability transitions field (Genus and Coles 2008) and our research suggests that it is particularly complex in the case of grassroots innovation. Bounding a case too narrowly around a particular innovation (e.g. the emergence of national type) risks obscuring the 'higher' levels of niche activity, as well as the significant antecedents. This is particularly relevant in the case of community currencies where models have spread geographically and evolved over time. However, the broader the focus, the more difficult it might be to empirically operationalise the case. This is not an easy tension to address, but our research does suggest that the interplay between different levels is an important feature of the way in which the overall currency field has developed and should not be neglected by the convenience of a narrower temporal or geographic analytical lens.

## **5.2 Niche-regime alignment in grassroots innovations**

A further, perhaps more fundamental issue for applying niche analysis to grassroots innovations is the challenge of identifying the relevant regime which the niche aims to transform or replace. As many grassroots innovations are developed in specific response to regimes that are perceived to be unsustainable, with the goal of replacing, transforming or being accommodated by those regimes, this is a crucial element of niche analysis, yet in this context it is not straightforward.

At first glance there is a common CC niche, as all these niche practices share a core similarity as novel socio-technical configurations of exchange. Indeed much of the literature treats them as a single field or movement (e.g. Blanc 2010). But, as noted above, there can be a range of motivations behind such projects and a variety of purposes that such exchange is intended to fulfil. For example, we have already identified a deep-seated distinction between those CCs which aim to complement and reform the provision of social care (and use CCs as a tool to achieve this), and those which are based on a critique of existing monetary systems and see CCs as a tool to build a more just and sustainable financial infrastructure. Clearly, these two niche configurations are responding to

different regimes. For example, local currencies, barter markets and mutual credit CCs often aim to build alternative financial infrastructures (niche practices are democratic control of the money system, anti-expansionist money, self-regulation based on trust and localised economies) to the money/banking regime (global institutions, growth-based, banks issue money). Contrastingly, service credits aim to improve social capital, civic engagement and wellbeing. Opportunities for such systems have arisen due to tensions in the regime of social care provision, particularly those based on professionalised providers and passive users defined by their needs. For example, the growth of service credit systems in Japan as a response to the aging population (Miller 2008). Indeed, this can be further complicated *within* particular currency types, where different systems can be engaging with different regimes, eg service credits which have been applied across a range of domains. Given that they 'face' different regimes, the challenge of unifying around common goals is even more problematic, in particular when it comes to efforts to lobby for change and translate elements of the niche practices into (multiple) incumbent regimes. This case suggests that for grassroots innovations, the question of 'which regime' is perhaps more fundamental and problematic than might first appear.

In part, this fragmentation can be explained by the different objectives, modes of operation and values that can exist within national types as well as between them. Consequently, the 'niche' is constructed out of a range of overlapping social movements, NGOS, activists and projects often with fundamentally different ideological bases and goals. It would be an oversimplification to view all these projects as being one 'community' or even sharing a common cause, despite their frequent and significant interactions at the highest niche level, and the error would be in focusing on the technologies used, rather than the objectives sought. In other words, in the case of grassroots innovation there is a much greater diversity of values and beliefs that motivate the innovation and which play an important role in explaining niche dynamics (Ornetzeder and Rohracher, 2012) This is in contrast to market based innovation where the primary objective, in most cases it to generate a financial return. Theories of niche development assume that technologies define socio-technical configurations, and so the literature does not deal satisfactorily with the complexities of differently-aligned value-based initiatives which share similar technologies. Yet our research indicates that goals and objectives are a more relevant dimension along which to demarcate niche boundaries than technologies. This indicates a technological-bias in the way niche theory might be applied to social innovations, by assuming that common technologies imply common interests and a consequent coherence. Arguably, existing theory therefore privileges the *technological* over the *social*, but our research with grassroots innovations suggests that this overlooks critical factors affecting the ability of influential civil society niches to form (i.e. the lack of common interests and vision). This has implications for how both regimes and niches are conceptualised.

In the case of niches it might be useful to draw on wider work that has engaged in the role of social movements in innovation processes. In particular, Hess' (2007) notion of technological fields might be useful. Drawing on the sociological tradition of field analyses (e.g. Bourdieu and Wacquant 1992) the concept of a technological field is intended to draw attention to the

Heterogeneous networks of organisations, regulations, users technologies, and associated products [which are] situated in a larger field in which the changing relations of co-operation and conflict with other technological systems take place.

Hess (2007, 74)

Like niche analyses, field analyses can be applied at a number of different scales. The particular focus of this kind of analyses is the dynamics of change over time and how values and power shape the evolution of the field. Exploring niches as fields – and in the case of grassroots innovations, fields

with diverse and strongly held values – might be a useful approach for understand complex niche dynamics.

In the case of regimes there has been some work on regimes crossing (e.g. Konrad et al 2008; Raven and Verbong 2009) but our research suggests that this needs to be taken further, particularly in the context of grassroots innovations. One area of future research relates to how certain regimes are conceptualised. For example, are ‘health’ or ‘education’ the same kind of socio-technical systems as transport or water? Whilst they may not have the same underlying technical infrastructure, they do still consist of socio-technical assemblages that are shaped and held together by set of complex rules. This issue is even more pertinent for the domain of the economic and financial system towards which many currency systems are orientated. To some degree the economic system has been somewhat ‘black-boxed’ by the sustainability transitions literature, which has close affinities with the ecological modernisation paradigm (Shove and Walker, 2007). A functioning capitalist system would appear to underpin much of the theoretical work, but the implication of this has not been explored properly. However, economic problems can also be characterised as forms of landscape pressure that provide pressure on regimes (Geels and Schott, 2010, 70). Therefore, the role of the economic system suggests that distinctions between regimes and landscapes can be blurred (Hess, 2012) and require further attention. Furthermore, like energy, the economy is a regime which cuts across many others. This suggests that more work needs to be done on how regimes interconnect (Hargreaves et al, 2012). This is particularly so in the case of some grassroots innovations where the objective is often not to completely displace the incumbent regime but to build a form of “parallel public infrastructure” that ‘aims to provide necessary systems that individuals can’t provide themselves’ (Darley et al 2006 unpaginated quoted in Hopkins 2006, 42).

### **5.3 Learning processes and niche aggregation**

One implication of the notion of fractal niches is that the different niche processes can be observed happening to different degrees at different levels. This challenges the assumed relationship between greater degrees of abstraction and niche standardisation. At the level of national types knowledge abstraction is evident; consequently, in the case of community currencies the national niche level appears the most relevant for regime-engagement and niche aggregation. However, at the ‘higher’ international levels we see ever increasing levels of fragmentation, complexity and branching. Despite increasing activity and institutional embedding at the highest level, there is no sense of a momentum towards unification of practices, expectations, standards-setting and mobilisation of resources. Yet it is at these is where theory would suggest that a trans-national standardisation of knowledge and practice should occur. It may be that community currencies are still, in longer historical perspective, an immature and nascent technology. Or it could be that grassroots innovations are fundamentally different. Certainly, the case of complementary currencies challenges the assumption that technological niches tend to follow a trajectory towards increasing consolidation and conformity of knowledge (Geels and Raven 2006).

Reflecting specifically on the learning processes of niche development, and given this fractal niche structure, our research uncovered a multiplicity of activities occurring at different levels. As noted above, one of the most interesting factors is that the accumulation of knowledge is not one of the key drivers of the niche. Formal learning is therefore *not* a pre-requisite for niche growth. However, it is not possible to ascertain what impact better learning processes would have on the overall trajectory of the niche. Douthwaite (2002, 161) has argued that currencies have found learning difficult because they lack good selection and promulgation mechanisms to encourage and capitalise on user learning selection. In other words, currencies, and other similar grassroots innovation, struggle to capture learning because they unfold in a social environment that is unpredictable and where experiments are often unrepeatable.

Referring back to Geels and Deuten's (2006) four-stage process of knowledge aggregation, it is apparent that across the niche system we see stages one, two and three happening simultaneously, with different actors, sub-niches and sociotechnical configurations. The *local* phase is evident where local projects are developing relatively independently of globally-shared knowledge, such as in Japan, where experiments seek to learn practical lessons for local implementation, and the information does not travel beyond those projects. In addition, there are many examples of new sociotechnical configurations (CC types) being developed and experimented with beyond the 'big four' models, representing high levels of local variety. The *inter-local* phase is seen where the national and international CC-type networks are formed around particular CC designs (forming some kind of proprietary networks), however the information-sharing is not confined to those networks in a competitive manner. The *trans-local* phase is demonstrated by the circulation of generic knowledge intended for use by all, and by the prominence of intermediary actors. Here, the highest-level CC niche is a good example of such knowledge aggregation, sharing and infrastructure (journals, conferences and handbooks), although without the attendant resources to set high standards and uniformity of design.

It is clear that while this picture is undoubtedly complex and messy, the phases reached by different levels of the fractal niche system are quite distinct. Furthermore, rather than entering only in the third phase, we see that intermediary actors have been present and influential from the very start, and in particular with the new 'phase one' elements, in carrying knowledge and inspiring new activities. The highest CC niche level is the most ambitious in terms of efforts put into resource-sharing and knowledge infrastructure, yet it is also the least coherent and cohesive layer as it comprises competing initiatives with quite different ideologies, and the least well-resourced as it relies on mainly voluntary input. At the national CC-specific level, the niches appear to be developing more effectively in terms of making links with local actors and regimes, yet they too are under-resourced and struggle to create the sort of infrastructure we see at the highest level. At the same time, new hybrid models of CCs are constantly being developed which further fragment the fractal niche system we see here with novel configurations appearing at the local level, and interacting with the global CC niche too, disrupting efforts to unify designs and speak with one voice. In other words, in this particular case of grassroots innovation, and in contrast to the theory, learning processes have not been linear or cumulative.

Consequently our analysis suggests that the acquisition of resources is critical to support the learning role of intermediaries and other actors. For example, national networks are most effective at diffusing new systems when they are well resourced and able to fulfil the functions associated with niche aggregation. This is not to say that CCs cannot diffuse without a national network, but there are clear examples of where well resourced national networks are able to support the spread of a particular model such as Banco Palmas in Brazil. However, the lack of resources to support learning processes is reflective of a wider issue with the viability of grassroots innovations, and the inability of currency systems to sustain themselves is clearly also a problem in many cases. Many are social economy initiatives reliant on volunteers and short term funding, leaving them fragile and vulnerable (Seyfang 2009). As non-market innovations they are unable to generate a surplus to sustain themselves through market transactions or from investors seeking a future financial return; they need to find other ways to recover their costs and provide resources with which to develop and scale up. From a theoretical point there might be benefit in drawing on both the social movement literature and the literature on the scaling of social innovation (Westley et al 2011). Furthermore, as this case does also support Geels and Schott's (2010) argument that SNM has underplayed the significance of resources, we can say that this is *even more* critical in the case of civil society innovations, and potential purchase might be found in Technological Innovation System theory (e.g. Markard and Truffer 2008) applied to a grassroots innovation context.

## 6 CONCLUSIONS

This paper has undertaken a niche analysis of the growing, international community currencies (CCs) movement to explore the extent to which niche theories of innovation diffusion developed for market contexts are relevant to the experiences of civil society-led, grassroots innovations in the social economy. It has revealed that some of the niche-building processes considered essential by sustainability transitions theory are being performed at a range of scales, and existing theories of market based innovation have some purchase, but they do not fully explain the processes of diffusion that have led to the emergence of this field. Our findings highlight the complexity of the processes by which grassroots innovations diffuse, and problematise a number of areas in the niche literature (attenuating the recommendations for policy and practice) which require further examination.

To some extent the processes of niche aggregation appear to have the most purchase at the 'national type' level, where there is clear evidence of intermediaries performing a range of roles that the theory suggests lead to the successful development of niches. However, this 'level' of analysis is only part of the story. Taken in isolation it does not explain the wider diffusion of systems over time. The role of antecedents and a wider geography are both significant. The fractal nature of the overall community currency niche suggests that processes at both a higher and lower resolution are also significant. This presents a particular problem for the bounding of cases. Even more so when trying to take account of the various regimes which these different currency systems 'face'.

Looking outward beyond the niche itself, we found that, in keeping with recent theoretical propositions, regime influences on niche development are strong, both in terms of providing opportunities for niche growth through aligning with current policy interests (or responding to regime crises), but also through constraining the scope for experimentation and action due to ideological mismatches and radical niche practices that explicitly oppose incumbent systems. The partial ideological overlap between the monetary reform movement and the community currency movement suggests that in this particular case there is the potential for action at different levels of society. Certainly some of the intermediaries are involved both in attempting to create landscape pressure and in supporting new grassroots experiments (e.g. Lietaer et al 2012).

Niche theories point to the need for increased funding of knowledge infrastructures, networking, training and sharing expertise, in order to better diffuse the lessons of multiple local projects and harness the untapped innovative potential of communities. However, in many cases, the emerging niche itself is fragile and remains vulnerable, in particular facing a dependency on volunteer input due to unreliable and short-term funding, and a consequent failure to adequately become institutionally-embedded. In the case of non-market grassroots innovation such institutional embedding seems more reliant on the securing of resources, than on the aggregation of knowledge and learning. Indeed the politics surrounding not only funding but the wider purpose and role of CCs appears to hinder the potential for greater degrees of co-ordination and consolidation.

Grassroots innovations for sustainable development represent an untapped community resource of innovation, and it is vital that we learn more about the processes through which such movements form, develop, and might be supported and harnessed to contribute to more sustainable development. Our hope is to have made a contribution to this endeavour, by indicating some promising ways forward for academics, practitioners and policymakers in the field.

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