BEAM EXCHANGE

Rethinking systemic change:
economic evolution and institutions

Technical paper

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December 2016

Citation

Cunningham, S, Jenal, M. (2016) Rethinking systemic change: economic evolution and institution. Technical Paper. Accessed from www.beamexchange.org. 2016 The BEAM Exchange.

This is the full technical paper. A shorter discussion paper is available at www.beamexchange.org

Published by:

The BEAM Exchange
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The BEAM Exchange is a facility for knowledge exchange and learning about the role of market systems approaches in reducing poverty.

Acknowledgements:

We would like to thank BEAM Exchange and DFID for providing the funds for this research, which turned out to be an intense learning journey to the roots of how economic systems change. We have been inspired by research from the likes of Brian Arthur, Eric Beinhocker, Richard Nelson, Douglas North, Mary Shirley and others. Our journey into complexity and evolutionary thinking was inspired by the teaching and coaching of Professor Dave Snowden. We are grateful to Charley Clarke for her editorial contributions and her readiness to pull us out of some deep rabbit holes and put us back on track. We thank Jodie Thorpe and Chris Barnett for providing comments to substantially improve the document and for their institutional support in getting this research off the ground. We would also like to thank Andrew Koleros and Sean Kirwan from Palladium as well as the whole team of Palladium's NU-TEC programme for inspiring discussions on how to practically apply our findings in their programme context. During our research, we engaged with groups of practitioners and experts on at least three occasions arranged at international events in London, Lusaka and Arlington, VA. We are grateful for the contributions, the questions and the encouragement of these practitioners. We are grateful for their feedback and their willingness to try many of our ideas in their practice even as we were still trying to come to grips with many ideas that seems so contradictory to what is done in practice. Most of all, we are grateful to our families who had to endure endless FaceTime calls between Newcastle and Pretoria, even late at night.

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The BEAM Exchange is a programme funded by the UK's Department for International Development (DFID) and the Swiss Agency for Development and Cooperation (SDC). It is administered by PricewaterhouseCoopers LLP, working with organisations including the Institute of Development Studies.

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Foreword: a new perspective on systemic change

Economic systems are constantly changing and evolving – in most cases without purposeful external development input. Some countries and regions have managed to reduce poverty and improve the wellbeing of their populations without using development instruments such as market systems development approaches or any form of external funding. 'Systemic change' as a development outcome by itself lacks meaning and is ambiguous. Too often in our work we see programmes claiming to work towards achieving systemic change while they are busy fixing narrowly defined problems guided by very specific objectives in very short time frames, while ignoring the broader systemic context. They then expect to be able to 'scale-up' the solution they have found and through that make it 'systemic'. We instead advocate an approach to 'systemic change' that is based on a deeper understanding of how economic systems change naturally and how we can influence that change to give it a different spin or accelerate it where possible (although some things will take time). Inspired by scholars such as Gary Klein and David Snowden, we could call such an approach *naturalistic economic development*.

We have a deep sense of unease about the prevalence of neoclassical economic logic in market development practice despite these approaches seeing themselves as originating in thinking around new institutional economics. We are convinced that the neoclassical view of the economy falls short of capturing the true complexity of socio-economic systems and their inner workings, as well as the interdependence between various key elements in these systems. This includes, for instance, the fact that markets are deeply embedded in societies, and their effectiveness depends on the emergence of social infrastructure such as trust and property rights. Over the last two decades, publications revealing a new understanding of socio-economic systems that better reflect reality have become popularly available, for example in the fields of complexity science and evolutionary or behavioural economics. These bodies of knowledge allow us to question the models we have been using and the opaque 'labels' they depend on – such as 'systemic change'.

This research builds on the bodies of knowledge of evolutionary economics, new institutional economics and complex adaptive systems, collectively often referred to as New Economic Thinking. It draws from these bodies an understanding of economic change that is relevant for and applicable by team leaders and their teams in market development programmes. This understanding is also relevant for programme designers, funders and policy advisers.

We are still in the beginning of a process of exploring all the consequences of the new and broader understanding of how economic reality works and how we can shape it. To date, most of the publications on New Economic Thinking have focused on policy makers, especially those in the financial and climate change areas. This report does not offer any final conclusions but rather gives a preliminary yet practically applicable synthesis.

In our view, development actors and countries have two options to approach so-called '*pro-poor* market development'.

One option is to invest in the long-term development of a healthy socio-economic system by helping it to adopt characteristics that have been linked to the broad-based development of industrial countries and societies and which have led to substantial wealth creation and poverty reduction. There is an emerging consensus among new institutional economists that for a country to create wealth and develop both economically and socially, it needs institutions that support open access to economic and political activities and that allow and encourage specialisation and innovation.

The other option is to implement activities that lead to short-term (within the lifetime of a project), easily measurable gains for the poor population in a country. This is what most development activities target. Even those who speak about achieving systemic change see it as a means to an end, namely to reach a high number of poor people and improve their immediate circumstances in the short term. We believe that the second option does not lead to 'real' development, which is a long-term, sustainable and resilient trend of wealth creation and inclusion. Rather it focuses on solving immediate problems that lead to measurable results, such as improved information flows to farmers within a selected value chain or improved use of quality seed in an agricultural sector. Projects then try to scale these solutions to a large number of people. While some of these solutions might reach more people, our experience tells us that they hardly ever have a significant impact on the institutional landscape – on the contrary, because they are able to scale-up in the existing institutional landscape they often reinforce the current institutional setup and slow down real development. Institutional change cannot be put in place by solving problems and scaling them up. Institutional change can only occur if the local actors who are part of the system become aware of their role in the system and have options to purposefully influence institutional evolution. An important heuristic from systems sciences is that a group that is targeted by an intervention is likely to become more marginalised, not less – a boundary is drawn around the people, and the group is given an often highly simplistic and idiosyncratic label, such as 'the poor'. Instead of labelling groups of people, the aim of market systems development should be to create opportunities for all people to engage in a functioning market economy.

We question the utility of the concept of systemic change in markets. It is not systemic change that development agents need to look for. Systems do continuously change also without external development actors. The aim of development must be to enhance the evolutionary process in an economy and create access to this process for all levels of the society, both politically and economically. Instead of systemic change, development agents need to go back to a fundamental understanding of economic change that is in line with the evolutionary nature of change. In this new understanding of economic change, the system actors are at the core and in the lead. The understanding focuses on creating adaptive capability among these actors and on creating opportunities for them that lead to evolution.

Marcus Jenal and Shawn Cunningham
December 2016

Glossary - translating the key concepts

This document introduces several concepts and terms from the selected literature. The glossary gives lists the key concepts in the order in which they are introduced in the text, with a section number reference to where the term is explained in more detail.

New Economic Thinking is the collective term that captures recent thinking into evolutionary economics and complexity thinking and its relevance for decision makers. See Section 1.3.2

Evolution is a general-purpose and extremely powerful recipe for finding innovative solutions to complex problems. At its core, evolution is an iterative process of creating variety and selecting designs that are fit for purpose, and then amplifying these by adapting resource flows. While in nature fitness is determined by the environment, in economies fitness can be intentionally influenced by human actors. See Section 2.2

Amplification occurs in economic systems as selected designs and business plans are rewarded with more resources and are widely copied by others. Central to this process are enterprises, but they do not act alone. They are supported by a rich environment of organisations, formal and non-formal institutions and a broader societal context. See Section 2.2.

Variety is needed for evolution to work. Evolution selects among a variety of different designs the ones that are the most fit for purpose. Variety is created in biological evolution through random mutations. In economies variety is created through a mix of deduction, coming up with new designs through knowledge and logic, and tinkering, trying new things. This is often referred to as deductive tinkering. See Section 2.2.

Selection is the evolutionary process by which designs that are fit for purpose are selected. Selection occurs based on a fitness function that is determined by various factors. In biological evolution the fitness function is determined by the environment and co-existing species. In economies there are two ways in which a fitness function is formed: it can by formed by a powerful person or elite, who actively select according to their preferences; alternatively, it can be formed by a market, which exposes the designs to consumer demands and preferences. See Section 2.2.

Physical technologies are methods and processes for transforming matter, energy and information from one state into another in pursuit of a goal or goals; they enable people to create products and services that are worth trading. It is not only the thing itself, it is both the design for the thing and the instructions and techniques to make it. See Section 2.2.

Social technologies are methods, designs and arrangements for organising people in pursuit of a goal or goals; they smooth the way for cooperation and trading products and services. Many transaction costs, search costs and cooperation costs are created or curtailed through social technologies. Even the arrangement that hierarchies such as companies can emerge and allocate resources to specialised functions and that can learn through tinkering and adjustment is a social technology. See Section 2.2

Business plans are made by enterprises and other private and public organisations that are competing for resources, acceptance and buy-in in the economic and political spaces. These business plans typically combine or fuse physical technologies with social technologies in novel combinations. The purpose of business plans is to discover what is profitable, efficient or even possible in a given economic context. See Section 2.2.

Institutions embody ‘the rules of the game’ both on the level of personal interactions and also

on the level of organisations, firms and government. Humans intentionally construct institutions to reduce uncertainty in and gain control over their environment as they perceive it. In economic terms, institutions govern and enable economic activity by establishing the incentive structures in a society and determining pay-out. Institutions reduce transaction costs and create positive externalities. See Section 3.1.

Markets are a place to exchange goods and services. They involve multiple exchanges, with multiple buyers or multiple sellers, and a degree of competition. A market is an institution through which multiple buyers or multiple sellers recurrently exchange a substantial number of similar commodities of a particular type. See Section 3.1.

Artefactual structure describes a society's cultural heritage and includes the institutions, beliefs, tools, techniques and external symbol storage systems inherited from the past. See Section 3.4.

Emergent order describes a system state that shows a kind of order in which no director or designer is in control but which emerges through the interaction of many entities. See Section 4.2.

Emergence describes the process through which a system acquires properties through the interactions of the individual components. It is colloquially often referred to by the phrase 'the whole is more than the sum of the parts'. See Section 4.2.

Complicated system: the functionality of the system is given by the sum of the functionality of the parts, thus a reductionist approach, where the system is taken apart and individual elements are fixed and then put back together. See Section 4.2.

Complex system: in complex systems the functionality of the systems only emerges through the interaction of the parts to generate something that is more than the sum of the parts – one needs to look at the system as a whole. See Section 4.2.

Attractors in social systems describe coherent sets of values and beliefs that encode specific behavioural norms. Attractors modulate information that enters the system, so their interpretation is in line with the current purpose of the attractor. See Section 4.3.

Boundaries constrain the behaviour of individuals in a system by defining what type of behaviour is not possible or not allowed. See Section 4.4.

1. Introduction

1.1 Rationale

The issue with 'systemic change'
Programmes applying market systems approaches aim to achieve systemic change, which "*not only provides scale and sustainability, but also a degree of resilience, allowing progress to be made in the face of changing external challenges*" (Humphrey, 2014, p.3). However, the community that uses market systems approaches has struggled to define what constitutes systemic change and the pathways to achieving it. In the monitoring and evaluation community, this view has been expressed the clearest. In a publication of the Donor Committee for Enterprise Development (DCED) on the topic of capturing changes in market systems, the author writes: "*There is no broadly accepted definition that clearly differentiates between changes that are and aren't 'systemic'. This is somewhat concerning, given the huge investment in programmes which aim to cause systemic change*" (Kessler, 2014, p.3). In a recent literature review on evaluating systems and systemic change conducted for USAID's Leveraging Economic Opportunities (LEO) project, Fowler and Dunn (2014, p.2) similarly find that "*evaluators do not share universally accepted definitions of systems and systems change*" and, according to their assessment, even leading donors in the field of market systems approaches do not agree on a common definition.

There is a feeling that the way current market systems development programmes devise their interventions does not reflect a good understanding of how markets work (or fail) and how change occurs in economic and interconnected systems. This comes out of consultation with several practitioners during the planning of this research to assess the scope of the project. They have pointed to the need to develop better theoretical grounding to achieve consensus regarding a common understanding of what constitutes systemic change in market systems and which frameworks can effectively support practitioners who work in this context. For example, one team leader of a major market systems development programme made the following statement: "*AAER*[1] *does not flesh out how systems really work; it relies on 'markets' as a black box. What is relevant for understanding systemic change is why markets come to respond in the way they do. I think the starting point should be academic insight, but then boiled down to a level that a practitioner can relate to it*" (personal communication).

Connected to that, there is also a sentiment that the market systems development community is succeeding in advancing targets but not achieving real change. Exemplary for many, this has been expressed by one key informant who was interviewed for a Think Piece commissioned by the BEAM Exchange (Wach, 2015), who stated that "*I have not seen a programme with enough impact to justify its costs. There are a few exceptions but they do not justify the rule.*"[2].

This study intends to build an understanding of how economic change occurs by linking economic change theory with market systems development practice.

Current definitions of systemic change and currently used frameworks
The implications of this lack of a clear and common understanding of systemic change means that donors, implementers and evaluators tend to re-define what they understand by systemic change, and how they intend to achieve and measure it, on a case-by-case basis.

1 The Adopt-Adapt-Expand-Respond framework is one of the commonly used frameworks to assess systemic change in market systems development. See Nippard, Hitchins and Elliott (2014).
2 Quote from interview notes used to develop the Think Piece, obtained through personal communication with the author of the Think Piece.

Practitioners typically combine desirable outcomes – particularly scale, sustainability and, more recently, resilience – with various systemic change frameworks that have been developed from experience. However, the problem with using attributes such as scale, sustainability and resilience to define systemic change is that they only define the outcomes of systemic change but keep the actual characteristics of what makes change 'systemic' in the dark. While achieving scale (seen as absolute numbers) may be a desirable effect of systemic change, this does not mean that, in turn, achieving scale automatically allows the conclusion that the change must have been systemic. Furthermore, these attributes in themselves are not clearly defined. This leads to a proliferation of definitions that include these terms without gaining clarity on what is meant by systemic change and how this can be measured. A participatory consultation among market facilitation practitioners run by the Systemic M&E Initiative of the SEEP Network identified inherent problems with the concepts of scale and sustainability as they are currently used in monitoring and evaluation. Scale is often limited to measuring the effects of the programmes on the poor that can directly be reached, rather than being based on an understanding of who is benefitting from any system-wide change. Sustainability, in turn, is generally seen as the permanence of what development agents do or provide to the poor, rather than the ability of the system to adapt to future changes and recover from shocks (Osorio-Cortes & Jenal, 2013).

The currently used frameworks are esentially 'heuristic', having been developed out of practical experience. They are rarely grounded in any generalised theory of how change occurs in complex social-economic-political systems. This can be exemplified by the currently dominant 'from pilot to scale' logic applied in typical programmes using market systems approaches and the connected Adopt-Adapt-Expand-Respond (AAER) framework (Nippard *et al.*, 2014), a systemic change framework that strongly embodies this logic. The typically applied sequence thereby is that the programme analyses the market system, points out a number of 'root causes' for underperformance with regard to the creation of benefits for the poor, and then suggests some remedies to overcome these root causes, typically in the form of changes in the behaviours of key market actors. These remedies are then transformed into new business models and tested in the market with selected partner businesses. The success of the intervention in terms of whether it has achieved systemic change is then measured by the extent to which the new business model leads to copying by and crowding in of other market actors (expand in the AAER matrix) and to what extent the system responds to the innovation by adjusting connected functions and rules (respond). A recent paper describes different strategies on how the innovations introduced by the programmes can reach scale. It is thereby explicit in saying that "*The starting point for all these strategies is that an 'innovation' (either a product/ service innovation or a process innovation) has been adopted and piloted by at least one market actor*" (Davies, 2016: p.8).

Demonstrating new technologies and business models can be a valuable tactic in achieving change in economic systems. Narrowing down pathways to systemic change to the prevalent 'from pilot to scale' logic, however, is not only limiting but ignores the reality of how economies change. The prevalence of this logic can explain why 'getting to scale' is such a big central topic in current discussions on market systems development and why many, if not most, programmes see it as one of their major challenges.

This is not to say that all programmes are adopting the narrow strategy described above. There are good examples of systemic change frameworks that recognise that systemic change is multi-dimensional and requires multi-faceted interventions. One example is the systemic change framework developed by the Market Development Facility (MDF), a multi-country market development programme funded by the Australian Department of Foreign Affairs and Trade (DFAT). The framework explicitly recognises that change needs to occur on multiple levels, namely in institutions, businesses and the target population (Jalil & Bekkers, 2015).
This paper aims to broaden the view of how change in economic systems can be shaped by adopting a broader strategy for change. It suggests eight principles that can be adopted by practitioners in the design and implementation of their programmes.

1.2 Objective and research questions

The objective of the research is to gain better understanding of how change in market systems occurs. This will lead to clear principles that support practitioners in designing interventions and assessing systemic change based on a framework that fits their purpose and context.

The research was designed to answer the following research questions:

- How can systemic change be practically defined based on the current theoretical understanding of how change occurs in complex (market) systems?
- To what extent do currently used systemic change frameworks reflect this theoretical/ conceptual understanding? Are particular frameworks more appropriate for particular purposes/contexts?
- How is this theoretical/conceptual understanding reflected in, or how does it differ from, the experiences of market systems development practitioners?
- Based on both theory and practical experience, what basic principles or heuristics can help practitioners to understand, work towards and assess systemic change?
- How could these principles or heuristics be used by practitioners to select frameworks for developing interventions to facilitate systemic change that are appropriate for their purpose and context? How can they be used to decide appropriate measures of systemic change?

The last question will be explored in a connected piece developed by the research partner organisation Palladium, which is applying the insights from the research in their programme NU-TEC in Uganda.

1.3 Methodology

1.3.1 Overview

The research consists of three parts which were co-developed in an iterative approach:

1. A **theoretical** part to establish a conceptual understanding of systemic change in market systems based on more recent academic work in New Economic Thinking. In this part, the team looked at **selected literature** to gain an understanding of how change occurs in complex socio-economic systems and to develop a set of principles to apply this understanding in practice.
2. An **experiential** part to harvest current experiences especially with regard to the shortcomings of frameworks. This part was based on three workshops organised with practice leaders and field practitioners to explore and discuss the findings from the literature review and the resulting principles based on practical experience.
3. A **practical** part that featured an investigation of the applicability of identified principles on the programme *Northern Uganda: Transforming the Economy through Climate Smart Agribusiness (NU-TEC)* implemented by the research partner Palladium.

This report covers the first part of the research. The practitioner workshops, however, had an influence on the direction of the research, and comments captured during the research were taken into account during the literature study. The third part of the research will be covered in this report in a separate case study.

1.3.2 Literature review

In the market development community, there is a broad consensus that markets are dynamic and complex systems. The literature was selected to reflect this consensus and capture the current understanding of complex dynamic systems in general and in the economy in particular. Consequently, three distinct bodies of knowledge were selected, which together are often deemed to represent what is called 'New Economic Thinking':

- Evolutionary economics[3] as it reflects the current understanding of how economies evolve and change.
- Institutional economics because it specifically focuses on market systems and how they emerge and work in a society based on a number of formal and informal institutions.
- Complexity and social change to reflect the general understanding of how social systems behave and change, and how we can describe and intervene in them.

What evolutionary and institutional economics have in common is that they emphasise dynamics, uncertainty and bounded rationality – something that is not well captured by traditional, neoclassical economic theory, which is why the latter was not considered.

Insights from these three bodies of knowledge can help economic development practitioners detect what is going on in an economy and give them a language to describe what they sense and think is happening and where they see their role in a change process.

The economy is an evolutionary system. Its behaviour and change over time can be explained by the three co-evolutions of physical technologies, social technologies and business plans. Various kinds of formal and informal institutions play a critical role in this co-evolution. The ability of these institutions themselves to become more sensitive to their evolutionary context, and to introduce or respond to variety in the system is critical for the economy. This sensitivity will lead to increased options for development available to a society. The richer the availability of options and the higher the incentives are for experimentation and creative competition, the more likely the successful survival and development of a society. Institutional change occurs by changing dominant beliefs in a society. Complexity and fields such as behavioural economics and cognitive science, which study individual and social change provide ideas of how change agents can support leaders of formal institutions to become better at engaging in a process of change leading to changes in beliefs and institutions.

As this brief synthesis shows, the bodies of knowledge, while overlapping substantially, also strongly complement each other. Only a few scholars have attempted to explicitly integrate them[4] and there are still important differences in emphasis. This work does not attempt to overcome the challenge of fully integrating the three, but takes the view that all three are essential in their own right to understanding economic development and change. Practitioners are encouraged to take a pragmatic approach towards the three bodies of knowledge in a way that is sensitive to what is covered by each body and what is not and where they are complemented by each other – or where further bodies of knowledge need to be consulted.

3 This review does not differentiate between the fields of evolutionary and complexity economics. It is not clear whether these are actually two distinct fields of research as evolutionary economics looks at evolutionary systems, which are in effect complex adaptive systems, and complexity economics treats economic change largely as an evolutionary process.

4 See for example Nelson (2002) and Pelikan (2003) for an attempt to bring new institutional economics into evolutionary economics. Also, evolutionary and complexity economics draws heavily from complexity sciences, see for example Arthur (2013).

1.3.3 Practitioner engagement workshops

Three practitioner workshops were held during the research period. The first workshop was held in London in April 2016 in the form of a kick-off workshop. The research team presented the research plan and collected feedback from the participants. In addition, the participants were invited to share their own experiences with systemic change and the frameworks, methods and tools they are applying.

A second workshop was held in Lusaka in May 2016 before the BEAM Conference. In this workshop, preliminary results were presented and discussed. The main points of debate and central questions were taken into account for the remaining literature study and report preparation.

A third workshop was held in Arlington, VA, preceding the SEEP Conference in September 2016. This workshop was co-organised with the USAID project *Leveraging Economic Opportunities (LEO).* During the workshop, the findings of this research project were presented and compared to the findings of a similar research programme conducted by the LEO team.

2. Economic change as an evolutionary process

During the official programme of the SEEP conference, several aspects of this research were presented in breakout sessions, further complementing the practitioner engagement process.

The interaction with practitioners proved valuable for validating research objectives and the relevance of preliminary findings. However, more discussion and engagement with practitioners is needed to translate the findings of the study into good practice for programme implementation.

2.1. Introduction

Evolution is a general-purpose and extremely powerful recipe for finding innovative solutions to complex problems. It is a pervasive learning algorithm that adapts to changing environments and accumulates knowledge over time. Evolution finds, from a vast range of possibilities, the designs that are most appropriate for achieving a specific purpose. In biological terms, the purpose of evolution is reproduction and fitness. In an economic system, the purpose is to cater to human needs and preferences and create wealth. The evolutionary process of creating variety, selecting fit designs and amplifying them is continuously repeated at different levels in the economic system.

The idea that economies continuously evolve, rather than approach a stable equilibrium, is not entirely new. It could be argued that both Adam Smith and Karl Marx already addressed issues that are now seen as part of the evolutionary economics school. Veblen coined the term “evolutionary economics” as long ago as 1898, when he was already asking why economics was not an evolutionary science (1898). Another well-known scholar who had a strong evolutionary perspective was Joseph Schumpeter (1964/1911, 1934), whose writings on micro level innovations within a broader context of economic affairs are still relevant today.

More recently, the seminal publication of *An Evolutionary Theory of Economic Change* by Nelson and Winter (1982) revived the critique of mainstream economics and its neglect of evolutionary and institutional change. An important contribution from their work was the idea of captured ‘routines’ or modules that enable learning, selection and replication.

Arthur, one of the founders of complexity economics, argues that there are two great problems in neoclassical economics that complexity and evolutionary researchers address (Arthur, 2013: pp.22-23):

- Firstly, neo-classical economics is mainly concerned with allocation in the economy: how quantities, prices and value are distributed across markets using fixed models.
- Secondly, mainstream economics is vague on the issue of formation, of how economies emerge and evolve in the first place, and the role of innovation, economic development, structural change, history, institutions and governance in the economy.

Evolutionary economics stresses complex interdependencies, the importance of competition (especially between different ideas), structural change and the role of institutions. It recognises the importance of the history and context and that economies evolve mainly through a process of learning at many levels.

Nelson (2015: p.6) argues that “*Economic development, as we have experienced it, is a very complex process. Many different kinds of activities and institutional actors are involved, and they interact in complex ways. There are many aspects to the process. To understand economic development this complexity needs to be recognized. One of the blinders to our understanding that I associate with the rise of general neoclassical theory is that it has encouraged us to believe that the gist of what goes on in an economy can be captured in a simple theory that*

focuses on a very limited set of actions and actors. No theory of economic development that is focused on just a few variables and activities and institutions is, by itself, adequate to the task".

The next section will explore how the evolutionary process unfolds in the economy.

2.2 How economies evolve

The economy is a mechanism by which different solutions are developed, tested and amplified. The mechanism of evolution to achieve this is to increase variety, select appropriate and fit designs and amplify them. Where the efforts of many competing solution developers are tested, i.e. where there is continuous competition for the most appropriate solution, designs are continuously refined through this process. This process is repeated at different levels within an economic system:

- At the level of individuals, where their cognitive capacities allow them to generate and select between a variety of alternative ideas. They then try to convince others of their ideas, both informally and formally. Factors that contribute to the ability of individuals to generate alternatives include experience and education, but the cultural and social contexts are also important factors that make certain ideas even possible to consider.
- Within organisations, where appropriate ideas, often in the form of routines or identifiable modules, are selected from a variety of alternatives and then acted upon.
- At a more aggregate level in the society, where the offerings of different organisations that are deemed appropriate or desirable are selected by other actors. More successful designs thus gain prominence and more resources are allocated to create them, re-allocating resources away from less successful designs.

In the economy, the market[5] takes on the role of the selection mechanism at the level of the society. In the market, the creativity of companies in solving important problems in a society are tested. Markets provide incentives for businesses to increase **variety** by trying new ideas. They also provide the fitness function for **selection** by having multiple similar businesses compete for the demand of the customers. Finally, markets provide means to shift resources from unfit to fit designs, which leads to **amplification**. Good ideas are adapted and integrated into a wide range of different contexts.

> Through competition, markets provide incentives to try new things and create variety. Through customer preferences, they enable selection of the most-fit ideas. Good ideas are amplified by shifting resources from unfit to fit designs.

Economic evolution occurs in different spaces. Nelson and Winter (1982) proposed that an economy changes due to an ongoing process of co-evolution between social and physical technologies.[6] Beinhocker (2006) adds a third space that he refers to as 'business plans'.

5 This study focuses on evolutionary processes in the economy and thus the market as a place for selection on a societal level. The same ideas are, however, also valid for other social processes. For example, also in politics there is competition for ideas that are appropriate for solving societal problems. Similarly, these ideas evolve through different levels. In a democracy, one could say that they are selected first by individuals, then within parties and finally in the 'marketplace' of elections.

6 The word technology used here may seem odd for the intended audience of this research paper. Arthur (2013: p.14) defines technology as a "means to human purposes", which could include not only industrial processes, machinery, medical procedures and algorithms (referred to as physical technologies), but also business processes, organisations, laws and institutions (social technologies). Thus technology is about knowledge of how to achieve things.

> The economy evolves through a co-evolution of physical and social technologies as well as business plans. While variety is created in all three of these domains, it is business plans that are eventually put to the test of selection in the real world.

Beinhocker (2006) describes the three co-evolutions as follows.

Physical technologies are methods and processes for transforming matter, energy and information from one state into another in pursuit of a goal or goals; they enable people to create products and services that are worth trading. A physical technology is not only the physical object itself, but both the design of the thing and the instructions and techniques to make and use it. The ability to learn how to use, make and adapt the physical objects is critical.

Physical technologies generally consist of modules that can be combined, re-combined and adapted in novel ways. Physical technologies are cumulative; each new breakthrough or novel arrangement creates a new building block and exponentially increases future development options as the stock of 'modules' or building blocks' increases.

> Central to the use of physical technologies is the ability to combine and recombine existing elements in different contexts. This requires creativity and the ability to learn and adapt.

An example of a physical technology is the use of a smartphone in a small business. The entrepreneur would not only have to acquire the physical phone itself, but also master the use of the phone. Furthermore, it needs to be integrated into management processes, for example by adapting how the company manages time by using the shared calendar function.

Social technologies are methods, designs and arrangements for organising people in pursuit of a goal or goals; they smooth the way for cooperation and trading products and services. For example, the ability to organise people into hierarchies, such as companies or other organisations, which can allocate resources to specialised functions and which can learn, is a social technology.

Like physical technologies, social technologies are modular. They can be captured as routines (for example administrative procedures), arrangements (for example a joint stock company) or even values (for example valuing team members' opinions). As such, they are also cumulative, and each new module opens new possibilities for a variety of new combinations.

Social technologies are closely related to the concept of institutions in economics, but they go further. While North (1990:3) defines institutions as "*the rules of the game in a society*", Beinhocker (2006) includes other aspects in his description of social technologies, such as structures, roles and processes. Institutions will be discussed in more detail in Section 3.

Beinhocker (2006) argues that the real driver for increasing productivity in the Western world was changes in how companies organise and manage themselves, in other words, innovation in social technologies. This innovation is not just shaped by good managers inside a company, but also by the society's definition of such changes. For instance, an important social technology is the system of laws and regulations and how they are enforced in a society. Laws and regulations make it easier for strangers to cooperate, work together and trade.

Of particular interest for economic development are the social technologies in the form of institutions that emerge to reduce the costs of cooperation, search for and find relevant information, and try new ideas. While some of these institutions may be associated with markets, or be seen to be 'market supporting', there are many that are hard to even directly associate with enterprises and markets. These institutions take the form of organisations that increase the

ability of a society to learn, adapt and change, such as the educational system, or documentary programmes on public television. Depending on the sophistication of the economy, more of these organisations exist to fulfil an extremely diverse range of functions. Not all of these organisations are public organisations.

> While some institutions that the economy needs to develop effectively could be associated with markets, or be seen to be 'market supporting', there are many that are hard to even directly associate with enterprises and markets..

This wide range of organisations are generally not at the centre of attention of development programmes. Market development programmes often focus narrowly on institutions that are directly relevant to specific sectors. They take into account certain institutions related to supporting functions and rules, but ignore the importance of institutions that are less obvious but nevertheless critical for the long-term viability of a market system. Examples of such institutions are organisations involved in all forms of education, technology development or industry promotion (such as standards bodies, testing facilities, etc.) that disseminate formal knowledge or create routines in the forms of regulations that can be adapted in other settings. In some cases, market development programmes might be aware of a range of formal supporting institutions, but still choose to work exclusively with enterprises at the micro level to upgrade them.

> A range of organisations, often publicly funded, play the role of enabling discovery, reducing costs of exploration, and transforming codified knowledge into regulations, standards, organisations and development programmes. These organisations are often overlooked by development programmes.

A key challenge in economic development is to understand why certain kinds of institutions, both in the private sector but also the public sector, do not emerge on their own.

Business plans are developed by enterprises and other organisations that are competing for resources, acceptance and buy-in in the economy. Business plans play the critical role of melding physical and social technologies together under a strategy and then operationally expressing the resulting design in the real world. From an evolutionary perspective, the purpose of business plans is to discover what is profitable, efficient or even possible in a given economic context.

According to Beinhocker (2006), a business is a person, or an organised group of people, who transform matter, energy and information from one state into another with the goal of making a profit. One could broaden this definition and see businesses in the wider sense as public or private sector organisations, such as small enterprises, large firms, government departments and non-governmental organisations, which compete for resources. Business plans are thereby developed and implemented by the management team of these different types of hierarchies. These strategies could be formally captured in documents and plans, or could be more informal. The process of developing these business plans depends on factors from within the hierarchy, but it also draws on capabilities beyond the hierarchy in the broader institutional landscape. -

While business plans create variety, there are two different methods of economic selection: 'Big Men' [7] and markets (Beinhocker, 2006).

7 The term 'Big Men' goes back to the concept of a 'Big Men Society' in the prehistory of humans, primates, where males competed with each other for sexual access to females. Later in human development, it was usually Big Men who led tribes and thereby also dominated decisions on economic affairs, providing the selection mechanism to choose one business plan over another one. Even today, much of the corporate world is still dominated by Big Men and not that many Big Women. Nevertheless, the latter can obviously play an equally important role in shaping selection.

‘Big Men’ mechanisms are associated with hierarchies and power, both on the level of individual companies and society at large.

In these hierarchies, selection is mandated rather than based on fitness for purpose. This often leads to choosing poor business plans over good ones because they are chosen to conserve power in the hierarchical structure and/or to benefit the people in power.

> Business plans create this variety for evolution to select from. There are two different methods of economic selection: ‘Big Men’ and markets. These two methods often build two layers of selection.

In reality, there is a dual layer system of business plan selection at work. The majority of economic decisions are still made by hierarchies – the hierarchies of firms, corporations and other organisations. Only small parts of designs are subsequently put to the test in a market.

This process creates an iterative loop of searching for ideas involving option generation, testing and selection. It starts within management structures and ultimately plays out in markets. Hence market economies are systems of competing hierarchies, with the visible evidence of this competition being the competence of management processes to create variety and pre-select designs to put to the test in markets.

Amplification of selected business models occurs as selected models are rewarded with more resources and are widely copied by others. Central to this process are enterprises, but they do not act alone. They are supported by a rich environment of organisations, formal and non-formal institutions and a broader societal context which shapes the market that serves as a selection mechanism.

Markets are important from an evolutionary perspective, but for different reasons than traditional economics teaches – namely being a mechanism for efficient resource allocation. Markets

- are evolutionary search mechanisms
- provide incentives to create variety
- provide a fitness function and selection process
- provide means to shift resources from unfit to fit, thus amplifying good solutions for survival.

Beinhocker (2006:294) concludes: “*Markets win over command and control not because of the efficiency of allocation, but because of the effectiveness at innovation in disequilibrium”*. Markets work because they enable a decentralised search and discovery process for solutions that meet the requirements of a specific economy or society.

2.3 Fostering diversity and evolution through self-discovery

Diversity (or variety) of options is a prerequisite for evolution to work. While in natural evolution, variety is created by random mutations in DNA, variety in the economy is created through a process of self-discovery (Hausmann & Rodrik, 2003). Rodrik (2000) states that this process can be called a meta-institution. He argues that if it is democratic and participatory, this kind of arrangement typically results in higher quality growth. This discovery process draws heavily on the ability of groups of organised people to conduct a process of combining existing ideas with new ideas in novel designs. Nelson (2003: p.20) stresses that *“some of our most difficult problems involve discovering, inventing and developing the social technologies needed to make new physical technologies effective”*.

Businesses that are able to generate or recognise modules that work better and that can be repeated elsewhere by drawing on their past experiences have a huge advantage over businesses that are not able to do so (Beinhocker, 2006; Nelson & Winter, 1982). Schumpeter already argued some time ago that innovation consists of *"the carrying out of new combinations"*, with many of these combinations depending on past knowledge or understanding of physical, social or economic properties (Schumpeter, 1934: pp.65-66). Dosi and Nelson (2010: p.103) argue that the ability of firms to learn, adapt and innovate is generally highly heterogeneous, idiosyncratic and unevenly spread.

Not all the knowledge needed to conduct ongoing discovery processes is available within a single individual or organisation. Hence social infrastructure, technology, education and business networks are important in connecting organisations into broader networks of knowledge (Hidalgo, 2015).

Hausmann, Rodrik and Sabel (2008) argue that structural change must overcome three main types of failure that hamper economic development:

a) **Self-discovery externalities**: Learning between different 'agents' what new products can be produced profitably in an economy, and how.

b) **Coordination externalities**: New local economic activities are often required simultaneously by different investors upstream, downstream and in parallel or in related industries. For instance, to promote a circular value logic would require stakeholders who may not even be aware of each other's existence or interests to develop new concepts along a new value chain that does not yet exist.

c) **Missing public inputs**: Private production typically requires highly specific public inputs – legislation, accreditation, R&D, transport and other infrastructure specific to an industry – of which government institutions often have little up-front knowledge.

For the evolutionary process to work, it is essential that entrepreneurs and a wide range of social actors have an interest and the incentive to discover individually and together more of what is possible. This insight is often ignored by market development programmes. Instead, they focus on proliferating a solution to market underperformance that was developed by sector experts in the programme team. If programmes indeed aim to strengthen economic development, it makes more sense to enable market stakeholders to experiment and try new ideas than to suggest solutions, even if this does not lead to immediately measurable results.

Central to the process of self-discovery is the generation and use of information and knowledge. Some of the elements of this knowledge could be public goods when they are non-rival or non-excludable.

One way of developing new knowledge is deduction from previous and from scientific knowledge by way of 'thinking up' solutions to specific problems or challenges. Tinkering and experimenting is another mode of knowledge generation. Sometimes it precedes deduction, other times it follows. Tinkering is often faster for the development of ideas, as it can take place in a more decentralised and distributed way. The term *deductive tinkering* is used to describe an iterative approach to problem solving that combines deducing insights from scientific knowledge and tinkering with new ideas through experimentation (Beinhocker, 2006: p.238).

The process of generating, using and adapting knowledge and information is easy to relate to physical technologies, but it is also important for the evolution of various formal and informal institutions and organisations and other forms of coordination – i.e. social technologies. Both Beinhocker and Nelson argue that the process of deductive tinkering in social technologies is often much harder, probably because it is also harder to document and compare successful ideas (or modules) with less successful ones (Beinhocker, 2006; Nelson, 2002).

Social technologies are slower to adjust than physical technologies. It is easier to capture, document and describe physical technologies, thus they are easier to replicate and adjust. Hence there is a temptation to focus exclusively on physical technologies and ignore social technologies, leading to unsustainable development outcomes.

A range of organisations, often publicly funded, play the role of enabling discovery, reducing costs of exploration and transforming codified knowledge into regulations, standards, organisations and development programmes. When these organisations emerge, new entrants are likely to be at less of a disadvantage than incumbents – they still have less experience but they can draw from the latest knowledge (Nelson, 1995). For example, universities play an important role in lowering the costs of gaining access to new knowledge, codified knowledge and research.

The process of deductive tinkering is also very dependent on the social context and the ability of hierarchies to allocate resources, recognise and take up learning, and combine new knowledge with existing modules to create novel solutions. It is path dependent as past investments and learning shape what is possible in the present and in the near future.

Besides fuelling the evolutionary process, the variety that is created through this process of self-discovery also creates resilience. In an ever-changing environment, strategies or traits that are not relevant at the moment might become relevant or important in the future, so it is better to keep them around (Axelrod & Cohen, 2000). Genetic variety allows populations of species to adapt to a changing climate, over time amplifying traits that might have been marginal for a long time. The same is true in a population of businesses or even within a business. Keeping variety also means keeping strategies or types that might not seem immediately useful, reducing the overall efficiency of the system. Efficiency would call for the elimination of strategies that are not optimal and only keeping resource strategies that are optimised for the current conditions. Resilience thus calls for a certain level of inefficiency in a system.

There is an optimal level of variety. Too little variety and the system will produce less innovative solutions to complex problems and it will be less resilient to change. At the same time, too much diversity does not allow stable and coherent structures such as institutions to emerge, essentially inhibiting the effectiveness of a system. This tension is illustrated by the trade-off between exploration and exploitation (Axelrod & Cohen, 2000). In an exploratory state, variety is likely to be high as many different things are tried. During exploitation, standardisation and optimisation are key to getting the most out of a solution that works well in a stable context.

This section focused on how economies evolve through a process of creation of variety through self-discovery and selection within hierarchies, and through markets and amplification by shifting of resources. It stressed the centrality of knowledge and learning, supported by a wide range of public and private organisations. The following section will describe the role of formal and informal institutions in this evolutionary process.

3. Institutions provide structure to human interaction

3.1 Introduction

Humans have an inherent tendency to reduce uncertainty by structuring their environment. Uncertainty in human interactions is reduced by creating structures that allow people to expect a certain behaviour from others in a specific situation. For example, in a football match, one can expect the players to adhere to the formal and informal rules. The rules of the game constrain what behaviour the players are expected to adopt. They may not, for example, pick up the ball with their hands and run with it to the goal. In the social sciences, the structures that reduce uncertainties in human interactions are often called institutions.

Through people's efforts to reduce uncertainties, institutional constraints accumulate over time and an elaborate structure of informal and formal institutions emerges. Institutions are 'the rules of the game' both on the level of personal interactions but also on the level of interactions among organisations, firms and government. The academic discipline of New Institutional Economics (NIE) is concerned with the institutions, formal and informal, that govern human interactions and exchanges in the economy.

According to North (2005: p.49), the institutional framework in a society generally consists of:

- the political structure that specifies the way we develop and aggregate political choices
- the property rights structure that defines the formal economic incentives
- the social structure – norms and conventions – that defines the informal incentives in the economy.

More concretely, common institutional arrangements include (Menard & Shirley, 2008:1, in revised order to mirror North's list above):

- constitutions, laws and rules that govern politics, government, finance and society more broadly
- written rules and agreements that govern contractual relations and corporate governance
- unwritten codes of conduct, norms of behaviour and beliefs.

Scholars differentiate between informal institutions that emerge from human interactions and are not codified but are rather part of the culture in a society and formal institutions as consciously designed and codified governance structures. Informal institutions include social values and norms as well as, for example, informal ways to enforce a contract. Formal institutions include written laws and rules, processes, etc. Institutions are complemented by, and their effectiveness is dependent on, enforcement mechanisms.

At the same time as reducing uncertainties for actors, institutional structures determine how the competitive environment is shaped and, consequently, whether an economy is competitive. Institutions reduce transaction costs and create positive externalities, for example through the coordination of available knowledge in a society, which allows the specialisation of production. North (2005:2) asserts that *"The evolving structure of political and economic markets is the key to explaining performance"*. The next section unpacks the concept of markets as social institutions.

3.2 Markets as social institutions

Markets are places where people come together and where multiple exchanges occur between multiple buyers and multiple sellers and a degree of competition. This institutional definition of markets excludes relational exchanges, i.e. repeated exchanges through durable relationships between individuals or companies. Institutions are necessary preconditions for markets to work effectively in the long run. Coase emphasises in his Nobel Prize lecture that *"without the appropriate institutions, no market of any significance is possible*" (Coase, 1992: p.4). Accordingly, market exchanges are regulated and shaped by laws and regulations as well as local customs and norms. In contrast, in an attempt to find universal principles, classical economists saw the market as a universal mechanism that is not dependent on the conduciveness or even sheer existence of a local institutional setting. The view that institutions play a critical role in market and economic performance has, however, moved to the mainstream of economic thinking over the last three decades (Hodgson, 2008, 2007).

Hodgson (2008) in his review of markets in the economic literature finds that the search for the 'optimal' rules and institutional forms for markets to work efficiently is difficult or even impossible. Other scholars, however, have come up with broad categories of institutions that need to be in place for markets to work.

McMillan (2002) found that a workable platform for a market has five specific institutional functions:

- information that flows smoothly
- property rights that are protected
- people must be able to be trusted to fulfil their promises
- side-effects on third parties must be curtailed
- competition in the market must be fostered.

Rodrik (2000: pp.5-10) identifies five non-market institutions that are needed for markets to perform which overlap with McMillan's institutional functions:

- property rights
- regulatory institutions
- institutions for macroeconomic stability
- institutions for social insurance
- institutions for conflict management.

In Table 1 the elements identified by McMillan and Rodrik in the preceding two bulleted lists are compared by Cunningham (2011: p.11).

Table 1: Comparison of McMillan's five market functions with Rodrik's non-market institutions

McMillan's five elements of a market platform	Rodrik's five non-market institutions
Property rights that are protected	Property rights
Side-effects on third parties are curtailed	Regulatory institutions
People can be trusted to fulfil their promises (or be held accountable)	
-	Institutions for conflict management
Information that flows smoothly	-
Competition in the market is fostered	-
-	Institutions for macroeconomic stability
-	Institutions for social insurance

Source: Cunningham (2011: p.11), based on McMillan (2002) and Rodrik (2000: p5)

From Table 1 it can be concluded that Rodrik and McMillan agree on property rights, although McMillan emphasises that these rights must not be overprotected. Rodrik's description of regulatory institutions and their functions combines McMillan's two elements, namely that side-effects on third parties are curtailed and that people can be trusted to fulfil their promises. The description offered by McMillan seems to rely more on social trust than on law enforcement, while Rodrik emphasises the role of laws and courts. Rodrik does not focus so much on information flows as does McMillan, but discusses competition and its importance elsewhere (Rodrik & McMillan, 2011; Rodrik, 2000).

Competition is central to the functioning of markets (McMillan, 2002). Vickers (1995: p.1) explains that competition is important for productive efficiency because:

- competitive pressure makes organisations internally more efficient by sharpening incentives to avoid sloth and slackness
- competition causes efficient organisations to prosper at the expense of inefficient ones, and this selective process is good for aggregate efficiency
- competition to innovate is the major source of gains in productive efficiency over time.

Not only firms compete. Public organisations compete for scarce resources and political support. Ideologies or political ideas compete for voter support. Countries also compete in global markets and for global support.

While many primitive forms of market can exist through personal transactions where trust is built by social relations only, many countries are held back by an inability to enable more sophisticated markets based on impersonal transactions (Shirley, 2008; North, 2005). Impersonal transactions occur when people transact with those they do not know, do not necessarily relate to, or will never see each other face to face. Impersonal exchange depends on a range of institutions that protect the rights of suppliers and buyers. For instance, organisations that promote standards, or laws that protect the rights of suppliers and customers, or regulations that shape how goods are sold, exchanged or replaced in case of damage are important to enable impersonal exchange. Societies that are missing these elements will be limited as to the

sophistication of transactions that can take place. While some of the institutions enabling this can be classified as 'market supporting', there are many others that may not be directly related yet are critical, for instance, basic education which enables people to read and write and thus enter into contracts.

> For markets to shift from personal to impersonal exchange a mix of institutions is required that is different for every country. While some of these institutions would be directly related to a given market, the non-market-related institutions are much harder to detect.

Shirley states that markets require two broad kinds of institution to be in place to realise gains from impersonal trade (Shirley, 2008: p.20):

- Institutions that foster exchange by lowering transaction costs
- Institutions that influence the state and other powerful actors to protect private property and persons rather than expropriate and subjugate them.

In conclusion, for a market to work properly as a place where multiple exchanges by multiple buyers take place, a framework of institutions is needed. Competition is central to the functioning of markets. Market transactions, however, do not exist in isolation from non-economic social interactions. Consequently, the social context and culture strongly influence market exchanges.

3.3 The importance of culture and the social context

Cultural heritage strongly influences people's perception and interpretation of reality. North (2005: p.27) explains this as follows: "*Ideas too far from the norms embodied in our culture cannot easily be incorporated into our culture. Ideas are adopted if and when they share a kind of cohesion that does not take them too far from the norms we possess.*"

If people in a society have experienced something in their past, they are better able to comprehend and react differently to a similar event than if the experience is too far from their shared experiences. Hence culture creates shared mental models that allow societies to face novel situations. It provides an accumulation of partial solutions to frequently encountered problems in the past. Only through this type of cultural transmission of learning were humans able to become the dominant species on the planet and keep developing beyond any single individual's capability.

> The shared experiences of people in a common culture create options for a society that others might not have. This enriches economic activities, diversity and ultimately economic performance.

Although institutions provide a framework for human behaviour and decision making in a society, actual decisions are taken at a specific time in a specific social and cultural context. The person taking the decision is interacting with other people and has various types of relationships with them. The person's mental model is shaped by his or her own experiences and history as well as by the culture and institutional landscape of the society which he or she is part of. The blend of the 'background' of beliefs, mental models, norms, values and institutions and the immediate context, including specific networks and social relationships, determine what decision is taken[8] (Hodgson, 2008).

8 Together with New Institutional Economics and Evolutionary Economics, the field of Behavioural Economics has been important in creating a better understanding of how humans act and make decisions. See for example Kahneman (2011), World Bank (2015), Thaler and Sunstein (2009). The scope of this research did not allow the inclusion of this body of knowledge, although it is certainly relevant for development practitioners.

Decisions are neither taken in a perfectly rational way, as posited by neoclassical economic theory, nor are they somehow predetermined by a fixed set of norms and values. They are always embedded in a given social context (Granovetter, 1985).[9]

> Mental models are constructed by individuals to make sense of the world around them. They are shaped by individual experiences and history as well as by the culture and institutional landscape of the society they are part of. They influence how people make decisions together with widely held societal beliefs, social norms, values and institutions.

Markets are also entrenched in social networks (White, 2002; Fligstein, 2001; Granovetter & Swedberg, 2001). Rodrik (2000) points out that this embeddedness is often ignored or assumed away by economists and econometric models and that the role of institutions does not really feature in mainstream economic thinking. Transactions take place predominantly within a familiar social context, as we prefer to deal with people we know or want to be associated with, or to buy known and trusted brands. McMillan (2002) identifies the ability to trust other players to keep their promises as one of the key factors associated with well-functioning markets. Trust can be achieved either through a social network of relationships, or through institutions that exist to enforce promises (or contracts), such as a functioning legal system. While the social context does provide a means to create trust in a market, in places where companies have to use bilateral relationships, communal norms, trade associations or market intermediaries as substitutes for the legal system, transaction costs are much higher (Granovetter, 2005; McMillan & Woodruff, 2002, 2000; Ellickson, 1991). Changing institutions to become more responsive to economic performance needs to become more prominent on the agenda of market development programmes. Achieving institutional change, however, is not something that can be achieved easily or that happens quickly, as is described in the next section.

3.4 How institutions change

The institutional framework emerges from the interactions of people in a society. These interactions are shaped by the dominant beliefs in a society. Beliefs shape how people perceive reality and how they respond to it. Dominant beliefs are those held by people who have the power to shape policy in a society. According to North (2005: p.2), belief systems provide *"both a positive model of the way the system works and a normative model of how it should work".*

Institutional change occurs when people who are able to influence policy decisions perceive the current institutional framework as not performing effectively with regard to whatever measure of success they deem appropriate – generally in generating economic benefit for them and their social group. Institutional change is an intentional process shaped by actors who can achieve a certain amount of dominance through a combination of legitimacy, influence or power.

> As the beliefs of people or groups with power or influence have a dominant effect on the institutional landscape, development cannot be apolitical but needs to confront given power structures if it wants to achieve real change.

Institutions continuously evolve based on how actors who can gain influence make sense of their perceived reality, how they evaluate institutional performance and the subsequent intention of these actors to adapt the institutions to optimise economic outcomes. There is a feedback loop between dominant belief systems and the institutional landscape. Beliefs determine the structure

9 According to Hodgson (2008), the concept of 'embeddedness' introduced by Granovetter led to some discourse among scholars as there was no consensus on how to define the concepts of 'social', 'economic' and 'embeddedness'. Nevertheless, Granovetter's basic argument that any decision is influenced by the social and economic context in which it happens is still valid and relevant.

and evolutionary direction of the institutional landscape. The institutional landscape in turn shapes the behaviour of the economic actors and ultimately determines economic performance. The perceptions of the actors on the effectiveness of the current institutional framework shape their beliefs, and in turn again determine the drive of the actors in the system to change and adapt the institutional landscape.

> Institutional change is based on changes in the dominant belief systems of a society, particularly changes in how people perceive their environment and the success of the current institutional framework in generating social and economic benefit.

A consequence of institutions being rooted in beliefs in a society is that institutional change is an inherently local process – it is much harder to impose institutions from the outside. At the same time, a local learning process might take a very long time. Rodrik (2000) and Hollingsworth (2000) claim that the embeddedness of markets in a distinct social system is the reason why configurations of institutional arrangements that govern the behaviour of actors in one society cannot easily be transferred to another. Societies can borrow selected principles, but the effectiveness of such borrowing is often limited due to differences in culture, management styles and work practices.

Transplanting institutions is something development programmes often attempt. While these externally designed institutions are sometimes dutifully adopted by recipient countries, they remain essentially dysfunctional on the inside. Andrews, Pritchett and Woolcock (2012) call this phenomenon 'isomorphic mimicry'. Hence, as North (2005:viii) stresses, rather than design 'better' institutions, "*the focus of our attention, therefore, must be on human learning – on what is learned and how it is shared among the members of a society and on the incremental process by which the beliefs and preferences change, and on the way in which they shape the performance of economies through time*."

Understanding human perception and how people learn provides insights into how people update their beliefs. As the beliefs of people or groups in power have a dominant effect on the institutional landscape, development cannot be apolitical but needs to be mindful of given power structure if it wants to achieve de facto and not only pro forma institutional change. Institutional quality also seems to depend on the way power is distributed. Rodrik (2000) contends that participatory political regimes deliver high-quality growth, mainly because they produce superior institutions better suited to local conditions.

A second consequence is that institutional change is strongly path dependent – the current institutional framework and its history define how institutions can change in the future. As North puts it: "*We inherit the artifactual structure – the institutions, beliefs, tools, techniques, external symbol storage systems – from the past. Broadly speaking this is our cultural heritage*" (North, 2005: p.156). Path dependence is another reason why institutional change needs to occur locally and the form of change cannot be imposed externally. The change that development agents deem necessary might not be possible given the history of how current institutions evolved. Path dependence makes institutional change an incremental rather than a radical process, so institutional change takes time.

> Institutions are shaped by a society's history and formed by interactions between stakeholders. This results in a strong path dependence and incremental nature of institutional change.

When targeting institutional change it is important to bear in mind what North (2005: p.156) stated: "*The degree to which such cultural heritage is 'malleable' via deliberate modification is still very imperfectly understood*". North points out three specific challenges (North, 2005: p.157):

- The institutional structure inherited from the past may reflect a set of beliefs that are impervious to change either because the proposed changes run counter to that belief system or because the proposed alteration in institutions threatens the leaders and entrepreneurs of existing organisations.

- The artefactual structure that defines the performance of an economy comprises interdependent institutions; changing just one institution in an attempt to get the desired performance is always an incomplete and sometimes a counter-productive activity.

- A mixture of formal and informal institutions and their enforcement characteristics defines institutional performance; and while the formal institutions may be altered through policy decisions, the informal institutions are not amenable to deliberate short-run change, and the enforcement characteristics are only very imperfectly subject to deliberate control.

Institutions, formal or informal, do not emerge or change in isolation. They evolve over time in tandem with a society's perceptions, attitudes and beliefs. They are also interrelated and influence each other. Formal organisations that embody institutional functions often learn from other organisations, so an innovation in an unrelated institution could spill over into other institutions. Institutions also do not emerge in single sectors or even in single regions in isolation. Although they might show regional or sectoral specificities, institutions are a society-wide phenomenon. As North noted (second bullet above), optimising institutions in isolation is likely to miss having a systemic, long-term impact. This makes it even more important that institutional change is seen through an evolutionary lens, where change is not about fixing current problems but about nurturing a process of evolutionary change through encouraging exploration and the creation of options.

While this shows that achieving institutional change is far from quick and easy – indeed, institutional economists like North argue that changing central institutions can take generations – there is an emerging field of 'path creation' for institutional change (Sydow, Windeler, Müller-Seitz & Lange, 2012; Garud, Kumaraswamy & Karnøe, 2010). Importantly, in this model agency for change is internal to the system, rather than external, distributed and emergent through the interactions of actors and artefacts.

Changing economic performance requires diverse institutional changes that go beyond interventions on micro-level interactions between companies and individuals and macro-level framework conditions. Esser, Hillebrand, Messner and Meyer-Stamer (1996) define two additional levels of institutional interactions. Firstly, societies need to be open to change in general and open to change that favours economic evolution in particular. If, for example, a society does not tolerate failure, companies will not take the risk of experimenting with new ideas as this might threaten their very existence. Esser *et al.* (1996) term a society's disposition to create a favourable environment for economic development the 'meta-level'. Further, there is a need for specialised supporting institutions that tackle persistent patterns of underperformance in economies that cannot be solved by individual actors.[10] One such institution is, for instance, a broad agreement that a performance issue or pervasive pattern of behaviour should be addressed. This institution then results in organisations, programmes, projects or infrastructure being created to address this issue. An example of persistent underperformance that slows economic evolution is an underinvestment by the private sector in, for instance, skills development.

10 Classical economists often call these patterns 'market failures'. Evolutionary economists, however, contest the usefulness of the concept of market failure. Cimoli, Dosi, Nelson and Stiglitz (2006) for example write: "albeit quite common, the 'market failure' language tends to be quite misleading in that, in order to evaluate the necessity and efficacy of any policy, it takes as a yardstick those conditions under which standard normative ('welfare') theorems hold. The problem with such a framework is not that 'market failures' are not relevant. Quite the contrary: the problem is that hardly any empirical set-up bears a significant resemblance with the 'yardstick' - in terms of e.g. market completeness, perfectness of competition, knowledge possessed by economic agents, stationarity of technologies and preferences, 'rationality' in decision-making, etc. (the list is indeed very long!). In a profound sense, when judged with standard canons, the whole world can be seen as a huge market failure!" (emphasis in original)

An institution could emerge whereby it is agreed that skills development is lagging and should be addressed. This could be addressed, for instance, by investing in public education and integrating vocational training with on-the-job training. Non-governmental organisations may become involved in helping to re-train workers who have lost their jobs due to outdated skill sets. Even some private initiatives to upgrade worker's families may be established, and the government might create an incentive for companies to absorb young learners as interns. Esser *et al*. (1996) call this layer the 'meso-level', which consists of initiatives that emerge to address patterns of underperformance at the micro level. Esser *et al*. (1996) assert that dynamic development is not the result of isolated interventions, but of the way numerous factors, priorities and policies interact on the micro, meso, macro and meta levels to shape economic performance. Central to this process are organisations, programmes and interventions in the meso layer that connect the patterns observed at the micro level with generic policies originating from the macro layer, within a socio-cultural context created by the meta level orientation of the society.

> Institutions are a society-wide phenomenon. Optimising regulations or interrelations in a single or a few sectors is likely to miss having a systemic impact.

3.5 Institutions and development

In her book *Institutions and Development,* Shirley (2008) argues that economic development assistance needs to be fundamentally rethought, with institutions playing a central role in any economic development effort. She cites empirical research that finds strong positive correlations between GDP per capita and institutions such as *"(i) protection of property rights and enforcement of contracts; (ii) measures of economic freedom such as voluntary exchange, free competition, and protection of property rights; (iii) civil liberties; (iv) political rights and democracy; and (v) institutions supporting cooperation, such as trust, religion, and social clubs and associations"* (Shirley, 2008: p.80).

There is as yet no conducive empirical evidence on how effective a focus of development assistance on institutional development would be, particularly because the development of measures for institutional change is still in its infancy. Nevertheless, from a historical perspective, countries that have successfully developed their economies all have institutions that support impersonal market exchanges as opposed to exchanges that are solely dependent on the sellers and buyers knowing each other or another form of informally ensured trust. Hands-off transactions between multiple layers of strangers only work if they are governed by regulators, courts and a functioning system of enforcement.

> Countries that have successfully developed their economies all have institutions that support impersonal market exchanges as opposed to exchanges that are solely dependent on the sellers and buyers knowing each other.

Shirley criticises current development efforts for being either ignorant of, ineffective in changing, or even damaging, the local institutional structure. She lists three characteristics of institutions related to why development aid is not effective in changing institutions (Shirley, 2008: p.59):

- A society's fundamental beliefs, norms and rules tend to be durable, often lasting for centuries. Changes occur on the margin in less fundamental laws or organisations, but these are seldom sustained if the broader institutional framework remains unchanged.
- Institutional frameworks endure because they are congruent with underlying power structures. Powerful groups who benefit from the institutional status quo will actively oppose changes that threaten their power and wealth. Even without active opposition,

humans' habits and beliefs tend to resist revolutionary change. Without drastic changes in power structures and shared beliefs, institutional reforms in most poor countries will lead to large disparities between laws on the books and laws in practice, and between how laws are applied to the powerful and to the powerless.

- Sometimes changes in beliefs, power structures and institutional frameworks do occur and move countries incrementally toward more open access to economic and political power. Sustainable progress results from heterodox experiments that evolve gradually in response to competition and through adaptation to local conditions.

According to Shirley, aid agencies are not well positioned to meet these challenges for various reasons. To name but a few:

- Aid has a strong short-term focus with projects usually not lasting more than three to four years and each project is supposed to produce measurable results. This leads projects to focus on changes in policies, sector regulations, or organisations, not constitutions, norms of behaviour, or shared beliefs. Even if aid had a longer horizon, the processes and incentive structures within aid organisations are not conducive to achieving institutional change. These include relatively short rotation time of staff in a given country and performance measurement that is based on project approval and disbursement rather than project impact.

- Development aid tries to be inherently apolitical. Meddling in the political issues of a country is not seen as good practice. As a consequence, projects are designed within a given power structure and are inherently unable to achieve deep institutional change. Indeed, by working with people in power, power structures are legitimised and strengthened.

- Aid agencies prefer to promote Western best practice as the solution to failures in recipient systems rather than to allow local solutions to emerge. One of the reasons for this is that Western solutions are more easily defendable to approval committees at home. Also, stimulating local solutions to emerge would take too much time given the pressure put on projects to produce results. This creates an incentive structure that biases aid efforts to produce pro forma change rather than de facto change.

The question to answer is how development assistance can support actors in developing countries to shape the evolution of their institutional frameworks to become more conducive to economic growth, and to become better evolvers themselves. Looking at insights from evolutionary economics and New Institutional Economics (NIE), the answer is not to directly try and improve transactions at the micro level, but to enable developing countries to shape the emergence of an institutional landscape that supports economic activity.

Economies and social systems are inherently complex. Institutional structures emerge from the interaction between individual actors. The next section looks at various ways to describe these dynamics in complex systems.

4. Complexity and social change

4.1 Introduction

Complexity and dynamics in complex systems build an important link between the two knowledge domains presented in the previous two sections. They provide a powerful way of describing evolutionary dynamics and the dynamics of emergent institutional structures. They also give change agents a means to describe dynamics in beliefs, attitudes and perceptions of economic actors that shape these institutions. The science and practice of complexity also provide important clues on how change agents can engage in and shape the dynamics of complex systems.

Complexity science is not one distinct field of scholarship nor is it by itself a falsifiable theory. Rather it combines a collection of fields using a common set of theories on dynamics in various complex systems. According to Arthur (2013: p.2) "*Complexity is not a theory but a movement in the sciences that studies how the interacting elements in a system create overall patterns, and how these overall patterns in turn cause the interacting elements to change or adapt*." Axelrod and Cohen (2000:xvi) make the point that the complex adaptive systems approach, as they call it, is "*a way of looking at the world*. *It provides a set of questions, and a set of design issues.*"

A system can be defined as a set of interconnected elements that form a coherent whole with a distinct pattern of behaviour. These elements or agents can be as diverse as animals, cells, humans, organisations or businesses. In contrast to an aggregate, in a system the properties of the elements depend on the systemic context within which they are located. In other words, the system consists of the elements and, in turn, the elements are influenced by the systemic whole (Juarrero, 1999). For example, as part of a community people shape the way things work in the community but their individual behaviours are in turn shaped by the rules and norms of the community they create.

A complex adaptive system is a system in which the agents seek to adapt their strategies based on their perception of reality and their experiences. Companies, for example, continuously adapt their strategies to the moves of their competitors, changing customer preferences and regulatory bodies. If there are multiple populations of agents adapting their strategies to each other, the result is a co-evolutionary process.

Some scholars stress the difference between complex human systems and complex adaptive systems as they occur in nature. The latter are constituted for example by ants, birds, fish or cells in our bodies. Humans have the capacity to reflect on their actions and adapt their strategy based on how they perceive its effectiveness. Therefore, complex systems involving humans are sometimes called 'complex reflexive systems' (Beinhocker, 2013). Other scholars even dispute the usefulness of an atomistic view on human agents. They argue that humans are not separable individual agents with distinct mental models and strategies. Rather, their behaviour continuously emerges from the relation among interacting individuals and is therefore not fixed in a strategy but dependent on the specific situation and context (Padgett & Powell, 2012; Snowden, 2011).

> Humans have the capacity to reflect on their actions and adapt their strategy. Therefore complex systems involving humans are sometimes called 'complex reflexive systems'

The field of social or cognitive complexity (Snowden, 2011; Snowden & Stanbridge, 2004) factors in these aspects of human cognition and human interaction to create a deeper understanding

of social change. This field provides insights into how humans perceive their environment, how they learn and make decisions, and how they act in an (institutionally) constrained environment. As was alluded to in the section on institutions above, transformational change occurs when people perceive a discrepancy between their beliefs and the performance of the institutional framework and consequently work towards institutional change.

The following sections introduce several key concepts that are relevant to the understanding of dynamics and the development of intervention options in complex adaptive systems.

4.2 Complicated, complex and emergent

Kurtz and Snowden (2003) describe in their paper two different types of order in natural systems: 'directed order' and 'emergent order'.

Directed order describes a system where "*the relationship between an action and its consequences is knowable by bringing in relevant expertise*" (Hummelbrunner & Jones, 2013: p.2). In this space, solutions can be designed as it is clear what the problem is and an agreement can be found on how it can be fixed. These systems can be highly intricate and analysis difficult, which is when they are called *complicated*.

In complicated contexts, the system can be taken apart, defective individual elements can be fixed or optimised and then the system can be put back together. This can be seen for example when a car engine is fixed or when parts of a solar power generation plant are optimised. This works because the functionality of the system is given by the sum of the functionality of the parts. Taking the system apart and fixing or optimising parts individually leads to improved performance of the overall system. If one part fails, these systems often malfunction completely.

Emergent order is different. In these systems "*there is a fascinating kind of order in which no director or designer is in control but which emerges through the interaction of many entities*" (Kurtz & Snowden, 2003: p.464). Emergent order gives the system abilities that individual components do not have. Most abilities that we attribute to complex systems are emergent properties, such as consciousness emerging from a system of individually unconscious neurons; intricate patterns in the murmuring of hundreds or thousands of starlings emerging from individuals that follow simple rules and only receive signals from their immediate neighbours; a set of rules and norms emerging from a community of individuals living in close proximity; and so on.

> Emergence, while creating higher-level order and allowing access to new capabilities, in turn constrains the behaviour of the individuals.

Emergence is a process of the elements self-organising into a qualitatively novel state of interrelation, and hence a higher-level order. Emergence occurs when previously uncorrelated elements or processes in the system suddenly become coordinated and interconnected (Juarrero, 2000). An example of this process is the emergence of impersonal exchange in economies. Interrelations between individual market actors over time lead to the establishment of institutions that allow for impersonal exchange. Yet societies have not simply decided to design these institutions and put them in place from one day to the next – rather, they have evolved over time.

> Complex systems, including systems of human interactions, are dynamic systems. Humans can self-organise into a more structured way of managing processes and interactions, allowing them to acquire capabilities they were not able to have on their own.

Under emergent order, causality is not predictable because the structure of these systems is not fixed but continuously created by the interactions of the actors. The structure changes with the behaviour of the actors in the system. The behavioural choices in turn depend on the structure. This feedback loop creates continuous, dynamic adaptation. Interventions change the system in a way so a repeated intervention will lead to a different result. Hence an understanding of the causal relations for each change can only be gained in hindsight and not through foresight. Snowden (2011) therefore describes emergent order as being only retrospectively coherent. In other words, the effect of an intervention can only be assessed once it has been implemented. In such systems, analysis and intervention have to merge into a process of continuous trial, learning and adaptation.

Typically in these situations, "*there is not only considerable disagreement about the nature of the situation and what needs to be done, but also about what is happening and why. The relationship between an action and its consequences is unknowable beforehand, depending considerably on context*" (Hummelbrunner & Jones, 2013: p.2). These systems are called **complex**.

The current overall functionality of the system has emerged because of the way the components currently function or behave, whether they are perceived as working correctly or being broken. Complex systems often continue to work when one component fails as each part continuously adapts to the functioning of the other parts to preserve the overall functionality of the system. Optimising individual parts will have unintended and unpredictable effects on the functioning of the overall system.

> *Complicated* and *complex* systems are qualitatively different. A completely different approach is required to solve complicated and complex problems. In the latter, change initiatives should not focus on solutions but on evolution.

The description of complexity and complex systems is strongly in line with the understanding of the economy presented in Sections 2 and 3. Effective institutions emerge without a central director or designer and provide an emergent order for human interaction. Effective institutions are the reason humans can achieve capabilities that are not accessible to the individual. For example, institutions are needed to coordinate specialised knowledge in an industry. The institutional landscape co-evolves together and the institutions are consequently strongly interrelated. Optimising them in isolation will have unintended and unpredictable effects on the overall system.

4.3 Attractors

Generally when a higher level of order emerges through human interaction, this novel structure becomes self-referential and self-preserving; the dynamic processes maintain, streamline, and renew their systems-level organisation (Juarrero, 1999). In other words, the dynamics form an attractor that defines and enforces behavioural patterns in the system going forward. Attractors define a specific behavioural pattern that actors in a system adopt over time. By structuring the system, attractors give the system an element of order. They alter the probability of the behaviour of the actors in the system. By doing this, they also constrain a system's possible future behaviour as they define behaviours with higher and lower probability, defining a system's specific disposition for change (Juarrero, 1999). "*Attractors thus promote stability in thought and behaviour despite changing conditions and contradictory information"* (Coleman, Vallacher, Bartoli, Nowak & Bui-Wrzosinska, 2011: p.42).

> Attractors determine a system's disposition for change by making some behaviours more probable than others.

To preserve their structure, attractors modulate information that enters the system so it reinforces the existing structure rather than weakens it. Even information that is contradictory to the emergent pattern of thought will be modulated by the attractor to confirm the pattern. Coleman *et al.* offer an example from the peacebuilding context: "*A peaceful overture by the out-group* [the enemy group]*, for instance, may be seen as insincere or as a trick if there is strong antagonism towards the out-group*" (Coleman *et al.*, 2011: p.44).

In practice, the concept of attractors can be used in a metaphorical way to describe dynamics in social systems. Attractors thereby describe coherent sets of values and beliefs that encode specific behavioural norms and lead to behavioural patterns. To use the concept of attractor in a metaphorical sense, one could say that people fall into attractors. They are formed through common use of stories, metaphors and practice. The participation in a social group that shares a set of common metaphors and practices makes people more likely to adopt these and over time it will be difficult for individuals to change the disposition that an attractor creates.

Different types of attractors therefore have different characteristics. So-called single-point attractors are relatively low in complexity and are relatively stable. They are built around one strong, dominant narrative that allows little ambiguity. An example of a strong, single point attractor is George W. Bush's statement after the 9/11 attacks: "*Every nation, in every region, now has a decision to make. Either you are with us, or you are with the terrorists*."[11] Single-point attractors are usually easy to recognise but difficult to overcome. Because of their small ambiguity, change can often only occur radically by completely switching to a competing narrative. More common in human systems are so-called strange attractors that are often formed by the common use of metaphors or myths in a community with a common culture. They give a sense of overall direction and pattern with enough ambiguity to allow diversity and contextualised adaptation. These attractors are often difficult to detect but are understood by the people in the system as 'the way things are done around here' (Juarrero, 1999).

The use of attractors in social change has been explored in conflict resolution and peace-building work as described by Coleman *et al.* (2011). In their work, "*An attractor represents a narrow range of mental states and actions that are experienced by a person or group. These psychological states are mutually congruent in their subjective meaning and thus provide a coherent frame of reference in processing information and deciding how to act towards others*" (Coleman *et al.*, 2011: p.42).

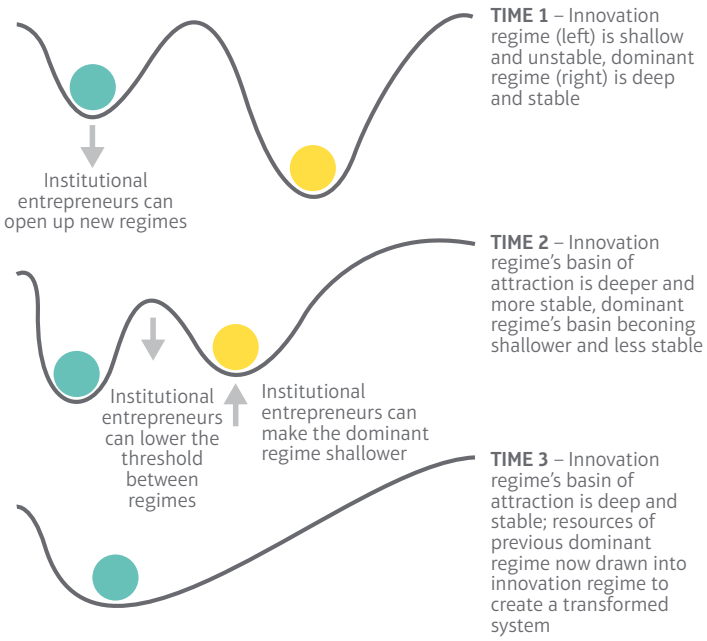
A system's change options are constrained by the disposition created by various attractors acting together. A system's dispositions can be described by using attractor landscapes (Snowden, 2011).

A relatively simple attractor landscape with two attractor regimes is shown in Figure 4.1 (Westley, Olsson, Folke, Homer-Dixon, Vredenburg, Loorbach, Thompson, Nilsson, Lambin, Sendzimir, Banerjee, Galaz & van der Leeuw, 2011). Initially (Time 1) the system has two regimes formed by two attractors, an existing dominant one that is deep and stable (blue ball) and a latent, still shallow and unstable new one (green ball). The dominant attractor could for example be formed around an understanding of a geographical area as being remote and difficult to access. Operations of the private and the public sectors are not adapted to the geography and therefore lead to high transaction cost. The area therefore does not allow viable businesses to emerge.

11 http://www.voanews.com/a/a-13-a-2001-09-21-14-bush-66411197/549664.html [accessed 20.11.2016]

Figure 4.1. Dynamics of a system of two attractors. The system is shifted from one to the other by institutional entrepreneurs

Source: Westley et al. (2011)



In the regime of the latent attractor, the area is a viable place to do business as adapted operational processes have been developed to mitigate transaction costs. Technological innovations mitigate specific challenges such as transport. This attractor has been formed by change agents that introduce a new regime in the form of a coherent set of behaviours. Over time the new attractor becomes more stable as more resources are directed towards it (Time 2). At the same time, the old attractor basin becomes shallower, until eventually the old attractor disappears (Time 3).

Social attractors emerge through continuous interactions between a group of people. They are formed and transmitted culturally through the common use of stories, metaphors and practice. Members of a social group who share a set of common metaphors and practices are more likely to adopt the behavioural norms transmitted through these metaphors and over time it will become difficult for individuals in the group to change their behaviour independently.

New attractors emerge when various enabling factors interlock to allow system actors to self-organise into a new set of interrelations and to adopt a new set of behavioural norms. This new behaviour generally entails new capabilities not accessible to the people before. To enable emergence, change agents need to stimulate 'enablers' to catalyse new attractors. This can be done in the form of a portfolio of safe-to-fail experiments.

Evolutionary processes also follow complex dynamics that can be described by attractor landscapes. The evolution of physical technology, for example, is dominated by successive technological paradigms. These paradigms are embodied in dominant attractors that structure thought. Dosi and Nelson (2010: p.67) describe technological paradigms as "*cognitive frames shared by technological professionals in a field that orient what they think they can do to advance a technology*." Ideas on how to solve technological problems are shaped by the attractor; they are more likely to follow the logic of the current technological paradigm than to break with it. The attractor influences both what perspectives are considered (who is asked for ideas) as well as the search heuristics applied. People will, however, inevitably tinker with innovations belonging to new technological paradigms, which creates latent attractors – attractors that are not yet dominant but can be clearly discerned. If in the selection criteria in the evolutionary process shift, a small innovation based on the thinking of a latent attractor can be selected and amplified throughout the system, this can lead to a tipping point and regime shift through which the latent attractor becomes the new dominant attractor and the technological paradigm shifts. This dynamic is often illustrated in subsequent technological S-curves (Foster, 1986).

From an institutional perspective two distinct institutional arrangements can be characterised as examples of attractor regimes. On the one hand, there is an institutional regime that features policies that are designed to generate rents and protections that keep the dominant ruling coalition stable. On the other hand, there are institutional regimes that promote open access to political, economic, social and intellectual infrastructure (Shirley, 2008). Development generally seeks to achieve a regime shift from the former to the latter.

Another set of attractors in institutional arrangements are markets that are based on personal exchange and networks as a basis for trust on the one hand and markets that are based on impersonal exchange on the other hand. In the latter, other types of institutions have emerged also to ensure trust in transactions between people who do not know each other and are not part of the same network

Recognising attractors, catalysing latent attractors and nudging systems to shift energy from the currently dominant ones to more favourable latent attractors as described above are options for change agents to shape economic development in a given context.

4.4 Boundaries

Currently the concept of boundaries is used in two different ways. 'Systems thinking' practice generally uses systems and boundaries in a conceptual way, defining a conceptual 'system' to model parts of the real world as analytical entities delineated by conceptual boundaries (Abercrombie, Harries & Wharton, 2015; Hummelbrunner, 2015; Williams, 2015; Williams & Britt, 2014). If used in this way, boundaries are drawn by researchers or change agents, for example around particular sectors, value chains, regions, the educational system, etc. While necessary from an analytical point of view, using the concept of boundaries in this way can be arbitrary and strongly determined by the biases of, and resources available to, the researcher. There is a constant need to be aware of these boundaries in order not to overextend the validity of the analysis that was carried out within the boundary.

In social complexity, boundaries are used to describe barriers in a system that govern the behaviour of the people. While attractors make a certain behaviour more likely than another, boundaries constrain behaviour by defining what type of behaviour is not possible or not allowed. Metaphorically, people fall into attractors and bounce off boundaries.

Beinhocker uses a phrase coined by Daniel Dennett to describe boundaries in evolutionary terms: '*Forced Moves'* (Beinhocker, 2006: p.212). In a certain situation, the evolutionary path can only go one way to avoid extinction. A Forced Move can occur when a specific design becomes the predominant solution and all businesses are forced to adopt it. Examples are the QWERTY keyboard becoming the dominant keyboard design, forcing many companies to abandon alternative designs and move to QWERTY if they wanted to survive (David, 1985).

Some boundaries are permanent, such as the ones established by the laws of physics or chemistry. Other boundaries change over time, such as boundaries around one species created by the existence of another species or laws in a society. In general, though, boundaries – particularly the ones that are not written but tacit and social – change only slowly. This understanding gives change agents a certain ability to predict what change is possible and what change is not.

Many institutions constitute boundaries, most notably the rule of law, which clearly defines behaviours that are not acceptable. Also, more tacit institutions such as social norms create strong and impenetrable boundaries, such as the custom in many countries that women are not allowed to travel to a marketplace to sell their goods.

As with attractors, change agents have to be aware of boundaries and can attempt to shift them or impose new boundaries if needed. This can, however, be quite risky because if boundaries are not in line with underlying customs and beliefs the results can be catastrophic.

5. Implications for market development practice

5.1 Introduction

In the previous three sections, it is argued that economic development is a complex, non-linear and continuous evolutionary process. Both market and non-market institutions matter greatly in shaping economic performance.

This section explores the consequences of this understanding for market development practice. It discusses how market development practitioners can engage in and shape an intentional change processes. To translate the theory into practice, seven principles are suggested that can be applied to market systems development practice.

The principles are not intended to be a recipe for market systems development practitioners on what to do in their programmes or for donor programme managers on how to design future programmes. Rather, they point out important considerations when market systems development programmes are conceived, planned, implemented and evaluated. These principles still need to be translated into appropriate strategies and actions for each programme. How exactly this is done depends on the context and the constraints that are faced by individual programmes and the organisations involved.

These ideas have been presented to various practitioners at practitioner engagement workshops and have also been applied to a current DFID-funded programme that is using a market systems approach in Uganda[12]. More experience of how to practically apply the principles is needed to see whether more concrete good practice guidelines on projects can be developed.

The following section describes each principle in detail.

5.1 Principles for market systems development

5.2.1 Principle 1: Shift from changing allocation to enabling evolution

Rather than fix market underperformance, market systems development needs to adopt an evolutionary approach to promoting economic change and the emergence of institutions that enable the poor and marginalised to access economic opportunities. This requires development actors to shift away from a focus on developing solutions to specific problems. Rather, they need to adopt a mind-set of exploration of what is possible from where the system is now. Development actors, however, are not the main actors in this exploration. On the contrary, development actors must make sure that relevant actors in the society and their networks actively lead the process of shaping evolution by adopting exploratory approaches themselves.

In market systems approaches, markets are considered important because of their role in allocating resources in an economy – a notion that is in line with neoclassical economic thinking. Programmes that apply pro-poor market systems approaches consequently aim to change this allocation by influencing how transactions are carried out in the selected market so that more resources are allocated to those market participants who are the poorest. Skewed allocation of resources and limited access to the market in general by marginalised groups is thereby seen as market underperformance.

12 An account on how these principles are applied in that programme is available in a separate case study.

It is undeniable that in many markets the poor are important participants, providers or buyers. If, however, economies are understood as complex and evolving systems that are shaped by dominant beliefs and institutional arrangements, as posited by new economic thinking, then market transactions work and resources are allocated in the best possible way within the constraints of the current structure of the system.

This includes allocation of resources to and provision of market access for the poor and marginalised parts of a society. This does not imply that all actors agree with the outcome. The structure is built on a collection of beliefs, perceptions, culture, history, available knowledge and formal and informal institutional arrangements. Consequently, it does not make sense to try to change people's behaviour without at least being aware of the structure that shapes that behaviour. This structure has evolved over long periods of time. The elements of the structure are closely interrelated and interlinked. Culture, for example, has a strong influence on the preferred institutional solution to a given problem. In an egalitarian structure, solutions will be more inclusive; in a highly competitive structure, solutions will favour the more competitive. The complexity of the institutional structure does not allow development actors to approach institutional change in a reductionist way, for example changing targeted behaviours, without being aware of the culture that shapes them. Engaging cultural realities is a matter that must be treated sensitively and in a non-judgmental way. However, ignoring culture is also not helpful.

This means that the problems of marginalisation of the poorer market actors cannot be solved by fixing selected 'market functions' in a reductionist way by influencing some actors' behaviour and 'facilitating' them to adopt a business model that was designed by development 'experts'. An example is a situation in which poor farmers are locked into a business model of producing low-quality produce and selling it for a very low price to anybody at the farm gate. A reductionist approach would, for example, analyse the problem and determine root causes, such as the limited knowledge of the farmers or their lack of access to input or output markets. Subsequently, the hypothetical programme would partner with a few private sector actors to establish a business model that would link the companies to these farmers, thereby fixing the problems of the lack of access to markets and information. This is often done, however, without a holistic understanding of the institutional context that led to these farmers being locked into their current situation in the first place. Even if the chosen solution is deemed a success in a project in the short-term, it generally does not create the ability for the beneficiaries, partners or broader society to replicate, adapt or further expand on this learning, especially if local institutions did not actively participate in the problem identification, the improvement process and the evaluation of learning.

This transition from fixing to exploring and the connected transfer of agency will be key to some of the following principles. It strengthens the resilience of the system and allows the actors in the system to shape future change. Given the intricacy and complexity of the social, cultural and institutional framework, and the time it took for it to evolve, development agents also need to be humble and realistic with regard to what change can be achieved.

5.2.2 Principle 2: Shift from market failure to market fitness

Markets need to be recognised as enablers of a decentralised search and discovery process to find ideas and solutions that work in a society. Market development actors can support this process by making markets more effective as mechanisms for evolution to work.

The health of a market from an evolutionary perspective can be measured by how it creates variety and how it selects appropriate designs. Healthy markets enable a range of offerings to emerge, some cheaper, some more expensive. The variety of the different offerings is enabled by market competition and a range of different enterprises positioning themselves in the marketplace using different business models.

Another dimension to healthy markets is the effectiveness of a secondary process through which enterprises and organisations generate and select ideas internally. This means that practitioners

should not only look at “what” (physical technologies) enterprises are trading in, but how they select, adapt and develop their options internally in the form of a market for ideas. This implies the need for better-managed organisations that draw from a constant stream of improvements in how they organise different people to work together towards common goals (social technology). The results of this internal process become evident in the variety and thoughtfulness of business strategies executed in the marketplace (business plans). Knowledge of how institutions, formal and informal, and structural factors affect the willingness of entrepreneurs to invest in and expand their enterprises and networks could be used to understand what formal organisations could do to promote self-discovery and innovation. This not only includes how people are developing their customer markets, but also how people are strengthening and expanding their supplier and supporting networks and markets.

Markets are important selection mechanisms. This means that change agents need to understand what shapes the ‘fitness function’. For instance, a given fitness function can prevent more socially or environmentally sensitive business models from emerging. The question becomes how this fitness function can be influenced. Options that can be explored to understand how the fitness function can be influenced include:

- Determine whether it is possible to work with more demanding buyers or procurement officials to influence specifications so as to shape supply, or whether unmet demand can be articulated or quantified.
- Assess whether buyers are able to distinguish between different options that fit their needs to varying degrees, or conversely, whether suppliers can distinguish between different kinds of buyers and their requirements.
- Explore whether the introduction of voluntary or compulsory standards make options deemed to be preferred more likely to be chosen, in other words, reduce the risks for buyers to make the wrong choices.
- As a last resort, assess whether changes in regulations or laws could shape the fitness function. It is a last resort because these interventions are risky as they are generally not safe-to-fail. Countries are often too quick to formulate changes in regulations and laws without understanding the consequences, especially if these changes are mandated or recommended by development actors. These initiatives are also prone to be captured by lobby groups and elites.

5.2.3 Principle 3: Strengthen variety by embracing diversity

Variety is a prerequisite for evolution to work. **Variety not only strengthens the evolutionary process by providing ideas to choose from, but the ability of a system to generate variety also creates resilience.** Building up a repertoire of ideas, modules and concepts that can be tried in different combinations, even if they are not used immediately, enables actors to design novel responses to unexpected situations.

It is impossible to define an optimal level of variety precisely or quantitatively. Too little variety means lower innovation and hence lower resilience. A symptom of this might be that too few suppliers of a good or service exist or that ‘dominant’ suppliers become complacent, resulting in decreasing value for buyers. In contrast, too much variety undermines the formation of stable structures. In these situations, often many people are trying different ideas and developing their own standards, processes and supply chains, with no dominant design or structure being established. Buyers complain about incompatibilities or simply contradictory information being spread by suppliers.

To assess whether there is a sound level of variety, it is necessary to consider industry and technology life cycles. In the beginning the variety is high; there are many competitors with many different approaches to solving a given technological problem. So long as there is not

excessive variety, dominant solutions will emerge and become established. This phase is followed by an exponential improvement curve where large increases in performance are seen. Typically, improvements to the performance of the technology are driven by several incumbent competitors, with many companies exiting the scene if their solutions are not selected – variety is decreasing markedly. After a while, the performance increase for every unit of investment starts to taper and return on investment diminishes. This is where incumbent firms are at their most vulnerable to new technologies, as they try to squeeze as much profit from their existing technologies without looking for new investment opportunities. However, new entrants find it very difficult to challenge the incumbents in the existing market. This is also the stage where growth is achieved by mergers and consolidation, leading to further diminishing of variety. Resilience is generally low.

In any given system there are limits to the range of variety that can be supported. For example, the viability of different business models is often constrained by technological factors, such as indivisibilities or the minimum scale required to make a technology feasible. Classical examples are large capital investments such as building a steel plant, or establishing a natural gas conversion power plant. What is feasible depends not only on the product and the broader value chain, but also on the economic context, investment climate, demographics, local buying power and a multitude of other factors. However, the challenge is that many actors become conditioned to a dominant way of doing things and the understanding of what different ways are possible is often not 'updated' frequently enough. Over time, attempts to create more variety often decreases, or is even resisted simply because it requires new things to be tried. This is one reason why 'outsiders', for instance people from a city who move to the countryside, are often able to identify business opportunities that long-time residents do not deem viable.

Development practitioners must be sensitive to recognising and uncovering past attempts to address development issues. They need to ask what has already been attempted, learned, or achieved; or what should be avoided and what may be worth repeating in a slightly adapted way. If only one or two attempts have been made, this might be insufficient for novel solutions to have emerged. If there was too strong an alignment in the mental models of the people seeking solutions, then the attempted solutions may have been too narrowly defined. Conversely, if too many people have already tried many new ideas, this may have created a lot of noise and no predictable or discernible pattern may have emerged. It is possible that only a few people have a clear idea of what was attempted, learned or achieved; or what should be avoided and what may be worth repeating in a slightly adapted way. In both extremes of trying too little or trying too much, the status quo often prevails.

5.2.4 Principle 4: Create and maintain situational awareness

The principle *strengthen variety and embrace diversity* discussed above shows how important it is for development actors, but even more crucially for the actors in the system, to be aware of what is happening around them. This awareness is central to a process of continuous exploration, learning and adaptation. **Being situationally aware means that the actors can construct and maintain a cognitive map that allows them to integrate diverse inputs, feedback loops, observations and the real-time status and performance of their programme's operations into their current understanding of the situation and adapt their strategy and interventions accordingly.**

Maintaining situational awareness can seldom be done by a small team of individuals or a single organisation on their own. To maintain situational awareness, links into a diverse network within and between organisations are needed. These links not only provide rich sources of information but also access to diverse perspectives that offer different angles on what is going on.

Situational awareness creates a unique combination of knowledge about 'how did we get here?', 'what is going on now?' and 'what are the opportunities for change going forward?' By its very nature, situational awareness requires that people who have different views must still be able to work together, and must strive to understand other people's perspectives even if they do not

fully agree with them. This requires social technologies such as trust and the ability of people to interact even if they have little in common.

How did we get here? The evolutionary nature of social and institutional change makes change incremental and strongly path-dependent. Hence situational awareness not only includes the situation that can be observed at present but also how the situation has evolved over time. Questions on what has already been tried (or not) become important. Understanding the past and especially how stakeholders choose to interpret the past is essential to be able to make sense of current behaviour and understand what is possible going forward.

What is going on now? Observation of the now needs to go beyond determining behavioural patterns and finding incentives to change them. It is important to understand the institutional framework. This entails the identification of beliefs and institutional arrangements that keep the current institutions in place. Questions to ask include:

- Who is trying to pioneer new ideas or change in the institutional landscape? Who is trying to preserve the current arrangements?
- Who is doing things differently? Who are the outliers?
- Who plays a role in articulating constraints, possibilities and patterns of underperformance in the economy? What frameworks are they using, e.g. traditional economics?
- Are there any cultural or other assumptions that are framing the current discourse?
- What are the narratives that shape the ability and inclination (or inability and lack of inclination) of people to try and improve their situation? How do leaders and their supporters form or describe the dominating narratives?

What are the opportunities for change going forward? By implication, this means that opportunities for institutional change could be revealed by finding out what is keeping people from making decisions and investments, or improving how they work with others. It is important to be sensitive to changes in the narratives of stakeholders and communities and to observe small shifts that may signal changes in attitude, behaviour or perspective. Questions to ask include:

- How are the dominant narratives changing?
- Where are new, alternative narratives emerging?
- Is energy shifting between different attractors that are formed by these narratives?
- Who is questioning the current institutional arrangement? Is there enough energy to shift to a new dominant narrative? Are there windows of opportunity to achieve deep institutional change?

For example, when working in a local economy, one of the authors once found that everyone they met described how nobody in the town was investing, and how the place was in decline. Yet the researchers noticed cranes and construction everywhere. The local business and government leaders chose to ignore evidence that contradicted their own narrative. Once the researchers pointed out this contradiction, some people quickly realised that they had more options than they thought they had. This is also an example of an attractor that strongly modulated how business and government leaders described a situation and chose to act upon the evidence they recognised. However, when the evidence was presented by an external facilitator, the narrative could no longer be upheld and the regime shifted from the previously dominant attractor to a new reality.

For international development, this means that the ability of private or public organisations to generate intelligence or to strengthen situational awareness might need to be built. The idea is to help key local organisations to become better at tracking change, spotting patterns, and mobilising their partners and society at large towards dialogue, solution exploration and change.

This focus on building the capability of local agencies and organisations to become more aware of their role and the system around them is fundamentally different from current approaches in market systems development which usually try to fix a problem in an underperforming market. If market systems approaches are to lead to long-term systemic change, the focus needs to shift towards changing capabilities within systems to self-manage a change process – over time, by enabling a continuous process of exploration and creation of options and variety, the actors in the system become the change agents. This process of change should be participatory or democratic to ensure that it remains transparent, both for learning purposes and to ensure that processes are not captured by elites.

5.2.5 Principle 5: Manage the complicated and explore the complex

The difference between *complicated* and *complex* systems and problems is a difference of type and paradigm, not of degree[13]. Complicated and complex situations need to be approached differently, as is shown in Table 2.

Table 2: Different approaches to complicated and complex situations

	Complicated SITUATIONS	Complex SITUATIONS
Causality	Stable, predictable	Only retrospectively coherent
Functionality of the system	Sum of the functionality of the parts	Emerges through the interaction of the parts; more than the sum of the parts
Change approach	Conventional, output-oriented project management techniques	Probe the system by running multiple, parallel experiments that are closely monitored for their effect on the overall system
Monitoring	Progress can be accurately measured against pre-defined deliverables and milestones	Progress needs to be observed as it emerges, feedback needs to be acted upon
Examples	Construction of a building or the setting up of an invoicing system in a company	Economic change
Domain of	Good practice	Emergent practice

The only way to make sense of how a complex system works is to continuously interact with it by exploring different avenues, to learn based on feedback received, and to adapt one's strategy. If patterns are observed that are perceived to be positive, they are amplified; if patterns emerge that are perceived to be negative, they are dampened. As it cannot be determined what works in advance, these experiments need to be safe-to-fail, meaning that if they fail they should not threaten the overall change initiative or lead to individuals or organisations losing face[14].

13 For an extended argument see Poli (2013).

14 The idea of probing a system by using safe-to-fail experiments is drawn from Snowden and Boone (2007), Kurtz and Snowden (2003).

The aim of these portfolios of experiments is to create a variety of options to be explored that were not available before. This links back to the principle of *creating variety by embracing diversity*. Hence the portfolio of safe-to-fail probes should be sufficiently diverse. To keep diversity of what is tried high, failure should be expected and encouraged, as this allows people to try things they expect not to work.

Change in complex systems is not linear but determined by temporarily stable regimes formed by attractors and boundaries. While change can appear gradual, it is important to understand when a shift in regimes between attractors occurs in order to understand whether systemic change has occurred. Attractor regimes are stabilised by many feedback loops. Systems tend to resist change. To achieve a regime shift, multiple enabling factors need to be in place at the same time to overcome the stabilising influence of these feedback loops. Being able to understand the disposition of a system for change by describing dominant attractors and important boundaries is part of the need to be situationally aware according to the principle *create and maintain situational awareness*.

Monitoring in complex change processes must be done differently than in complicated contexts. In the latter, progress can be measured against milestones and targets. In complex change processes, such milestones and targets cannot be precisely defined in advance. Consequently, monitoring needs to focus on detecting signals of change stimulated by safe-to-fail probes. This entails the ability to detect weak signals of change that are often captured through observations or hunches by people who know the system well.

5.2.6 Principle 6: Strengthen organisations that encourage and support self-discovery

In working economies that work well, so-called meso organisations emerge that support or shape all kinds of economic transactions. These organisations need to adapt and evolve in response to a changing socio-economic context. Central to the effectiveness of these organisations is an on-going process of learning and adjustment based on what patterns at the level of enterprises and consumers can be identified and how they are interpreted and responded to. The response typically comes in the form of programmes run by publicly funded organisations and incentives or regulations that shape the behaviour of specific targeted groups of actors. These developmental organisations do not always have their origins in the public sector but could have their roots in the private sector or non-governmental sectors.

A process of fostering self-discovery led by meso organisations in a developing country might include working with companies and organisations that are already better managed, better at articulating their problems and ideas, or those already in power or able to direct the allocation of resources. However, support to these leaders or outliers should be provided with the understanding that lessons and insights arising from cooperation will be disseminated to increase the stock of ideas, social technologies and solutions available to the wider society. Supporting such a process is not always easy to justify by a poverty-focused development programme. This could, however, offer a starting point and include the condition that barriers to entry and participation are purposefully lowered over time, and that transparency and participation are promoted.

Development programmes can map meso organisations that shape or potentially could shape the performance patterns of enterprises and other organisations by asking which organisations or sub-units in organisations and institutions play a role in equipping or shaping future generations of enterprises and leaders and how they can be strengthened. Supporting this process creates local knowledge of how to engage in processes of self-discovery. This knowledge can be recorded and made accessible even to non-participants and adapted to local ways of knowing by a range of organisations and enterprises.-

For local stakeholders to be able to repeat and adapt this process of self-discovery, the agenda must be set locally, even if it is imperfect from the point of view of development programmes. This does not imply, however, that external development organisations do not have an important role to play. Self-discovery and local agenda setting are prone to political capture, exclusion of marginalised and other groups, and manipulation by lobbyists or elites. Development practitioners in their role of process facilitators can provide invaluable guidance, reduce risks inherent in exploring and trying ideas and help stakeholders form inclusive and transparent processes of developing options as well as evaluating and trying alternatives. Lastly, for self-discovery to be effective, feedback mechanisms and reflection on what seems to be working and how it can be amplified, or what is not working very well and how it can be dampened, must be in place. At the start, this kind of open reflection might be hard without facilitation support.-

A hypothetical example could be a provincial government that is interested in promoting more agri-food processing to increase on-farm labour and value addition. An international development programme is requested to assist with the identification of key physical technologies and potential buyers to involve in a project to introduce new processing facilities. The programme leader, however, decides on a different approach. Firstly, a small team is established which includes larger farmers, a representative of a farmer cooperative, an agricultural extension officer, and a few smaller farmers. Secondly, the team is supported to establish contact and meet with potential buyers from larger retailers and food processors in a nearby metropolitan region to try and identify opportunities to expand local production. After several opportunities have been identified and documented in a series of interviews, the group calls a meeting to provide feedback on standards requirements, investments and conditions to successfully increase local processing and supply to the identified buyers. The larger farmer already has processing capability in place, but lacks sufficient volume to justify further investment. A deal is negotiated whereby smaller farmers act as contracted crop growers to increase the volume of produce, while the cooperative and the larger farmers co-invest in the expansion of production capabilities. Some smaller farmers have also heard of opportunities to expand their current growing to some more specialised cash crops that are in demand. Due to their awareness of buyers in the city they can slowly ramp up their production, while figuring out ways to coordinate their transport to the city markets. The agricultural extension officer decides to follow up with the buyers to identify other crops and the criteria that farmers must meet to enter these markets. Very soon the agricultural department develops printed information on opportunities, criteria and contact information on experts with technical expertise, as well as market and other details. Because this process was led by local actors and not by a development programme or government department, it enables the actors to repeat it for other sectors or crops, opening up numerous options in the future instead of just one. This process took longer than a consulting assignment would have taken, and is not perfect. In fact, the success of the process often depends on who is involved. Yet the result is a new level of organisational capability that emerged from the interactions of the local actors and is in line with the local reality, including culture and institutional arrangements.

5.2.7 Principle 7: Continuously link top-down and bottom-up development

Many meso level organisations evolve from a combination of expressed bottom-up demand and strategic processes driven by various levels of leadership from the top down. Top down is when new ideas are introduced in an autocratic or controlled way, regardless of which level of a hierarchy, organisation or society it originates from. Bottom up is about participation, about democracy and about collectively choosing between alternatives. There are instances where top down makes sense, such as when it comes to adopting international standards for food safety. In other cases, an imperfect local solution agreed to by many stakeholders can be more powerful than a mandated one that people do not adhere to. Development practitioners need to understand how top down and bottom up can be connected and better integrated.

There are many places, however, where this iterative process of integrating top down and bottom up can go wrong. Demand for services by the private sector may be poorly articulated or not present. The strategy of key meso organisations could be too generic, focused elsewhere, or resources spread out too thinly. Also, meso organisations could be poorly managed and not able to coherently respond to demand. Subsidiarity is critical as it allows solutions to emerge that respond to specific contexts. However, finding the most appropriate implementation level for a response is often hard if a neutral facilitator is not supporting the process between different public and private actors.

From a top-down perspective, the institutional functions discussed in Section 3.2 create important and pervasive enabling conditions for markets to emerge. Several institutions would be expected to provide these, for instance institutions that enable and protect property rights or competition and the possible emergence of specialised public organisations that regulate property exchange or competitive behaviour. Without these top-down policies and frameworks, many markets will struggle to grow and be effective.

Top-down institutions and organisations must also be shaped by bottom-up requirements that may be unique for each region or industry. Development cooperation can play a critical role here by giving voice to marginalised actors and local stakeholders, who seldom get the opportunity to shape the service offerings and regulatory processes of public organisations. For instance, the emergence of growing crops for biofuels in a region of a country must eventually be subject to regulations on how much food crops are converted into biofuels, supplemented by specialised agricultural extension services to lower the search and transactions costs of the farmers and producers.

One of the constraints on the development of effective sub-national public organisations is weak management capability of public organisations that serve a wide range of stakeholders such as in agriculture or industry. From an evolutionary perspective, the aim of development agents should be to create institutions that are themselves better evolvers. This means that they themselves can not only learn and adjust, but can also directly contribute to and shape the evolution of those around them.

In some situations, there is simply little or no demand for public services or a lack of participation and competition in a market. One intervention at micro level could then be to help enable and encourage new business models to emerge and new businesses to enter. This could be done by supporting incubation, or perhaps by supporting management and leadership education. The result will be new ways of organising, cooperating and managing (new social technologies), using resources that are available in the market but are not fully exploited. It is not about designing or selecting new models, but about promoting experimentation and reducing risks for new entrants. Again, instead of a development agent directly involved in shaping the framework conditions, a more systemic approach would be to work with meso-level organisations to help them shape an environment that stimulates variety.

The centrality of adopting a logic of subsidiarity when overcoming economic constraints mainly stems from the importance of the social context for market-based decisions. This was explained in detail in Section 2. The culture and context matter, and will shape how people recognise and respond to alternative options opened to them by meso-level organisations. These influences could be explicit or subtle.

6. Conclusion - reframing systemic change

There are three key ideas that economic development practitioners and policy makers need to understand.

Firstly, the economy evolves through a co-evolution of physical and social technologies that are combined in novel ways through business plans, which are then 'tested' in a market. This pattern is repeated in all kind of organisations, where alternative ideas and options compete for acceptance.

Secondly, formal and informal institutions, and a whole range of public and private organisations play a central role in enabling and shaping this evolution. Their role ranges from reducing transaction and search costs to regulating transactions, promoting competition and responding to persistent patterns of underperformance in industries. A society's disposition to change, shaped by its history and culture, strongly influences what is possible.

Thirdly, this process of economic evolution is a complex and therefore to influence or shape it requires an understanding of complexity and dynamics in complex systems. The process is inherently uncertain and strongly contextual. While there are some things that are complicated and that can be managed, coordinated and sequenced, there is a whole range of issues that do not have a solution that can be designed to achieve a predefined optimal state. These issues must be explored, working with local stakeholders to try new ideas and to see what works. What works in one context may not work in another, so imitating ideas from elsewhere without a deep sense of the local institutions and context will not work.

Consequently, shaping economic change is a process of joint sense making, exploration, adjustment and learning. This is also true for market systems development, as markets are an integral part of any economy.

Currently, market systems approaches are described as addressing "*the root causes of why markets often fail to meet the needs of poor people*."[15] As can be seen in this statement, the language used to describe market systems approaches – and consequently the way in which this is often translated into practice – is guided by a mind-set of fixing problems that is based on a logic that is causal. Systems are analysed, 'market failures' or 'root causes' are isolated and ideal solutions that are intended to benefit selected target groups are designed to fix these problems. It is then attempted to scale up the solutions that work in these pilots. Essentially, parts of the system that are deemed not to work properly are isolated and programmes attempt to fix them. As was discussed in Sections 4.2 and Principle 5 (Section 5.2.5), such a reductionist approach does not work to address complex issues.

Evolutionary change and consequently change in market systems must be driven by an endogenous motivation to explore what is possible, not by normative ideals of how resources and power should be allocated – particularly not if these ideals are brought into the system by external development agents. Evolution is incremental and always starts from where the society is at a given moment, considering a society's history as it shapes what is possible next. Evolution explores all 'adjacent possible' states to determine which one has the highest potential. Evolutionary change does not leap to idealised designed states.

The challenge is that in many developing contexts, the abilities to come up with ideas and drive a change process are limited. This could mean that the current configuration does not allow for a 'pro-poor' innovation to take hold as the actors in the local economy do not have the capacity to absorb all the changes that are necessary to put it in place.

15 Features of a market systems approach. The BEAM Exchange. https://beamexchange.org/market-systems/key-features-market-systems-approach/ [accessed 22.11.2016]

Numerous changes are needed in both physical and social technologies to be able to successfully exploit new business ideas, and getting there might require many steps and some time.

Development agents have given a lot of attention to providing solutions in both physical and social technology, informed by experiences in developed or other developing countries. In the best case, this was done through strengthening local innovation; in the worst case through transplanting blueprints from elsewhere into a new context, often displacing local efforts of learning by doing. But virtually no attention has been given to the question as to whether the appropriate social technologies already exist in the context so that the new technologies can be absorbed and accommodated and new business plans created that can compete and succeed in the local society and the local market place. In the case of physical technologies this has often led to a lack of adoption of the promoted technology. In the case of social technology, the results were often 'isomorphic mimicry', where on the surface new institutional and organisational models were adopted while 'the way things are done' remained unchanged.

To tap into the evolutionary dynamics of economic change, development actors can work with local actors to encourage self-discovery. By helping to reduce the risks of trying new ideas, more variety can be introduced. Also, development actors can support the emergence of institutions that enable the evolutionary process to function effectively. To advance innovation and evolution in a society, the way knowledge is generated and transferred is a critical issue. This critically includes how societies at large and specific groups of actors are approaching problems. In the concrete sense, for market systems development this means that the capacity of market actors to come together and go through a process of exploration and learning and the generation of local solutions cannot be replaced by a market development programme. The process needs to be based on the local institutional arrangements and organisational support, and should be as democratic and transparent as possible.

Evolution does not occur on the level of individuals or companies, but on the level of the society and the economy. It hardly ever involves the private or public sectors alone. In fact, from an evolutionary perspective, it involves both the private sector and the public sector, often in the form of policies, but also organisations that provide public goods and supports the micro level. It typically depends on the responsiveness of broader institutional sectors such as the education sector, which introduces diversity but also captures and disseminates codified knowledge. Furthermore, organisations are also required that promote technological upgrading such as standards organisations, research and development organisations and knowledge-intensive business and technological service providers. Market development programmes need to work with a variety of actors – they must not only focus on improving transactions but must enable the market system actors to more actively shape their own evolutionary path. A critical constraint in this regard is the capacity of local stakeholders to govern processes of inter-organisational dialogue between a wide range of public and private actors, the ability to evaluate alternatives, cooperate despite disagreement, and the value attached to the meta institution of democracy or participation.

This is, however, not only a question of putting the right institutions in place that make it possible for local actors to explore and exchange ideas. Institutions cannot simply be transferred from one context to another. Neither can they or their instruments remain static, they need to change with the context. Indeed, even scholars do not know which institutions are the 'right' ones to lead to innovation and evolutionary change. Similar institutions in different contexts can perform very different functions. Effective institutional change needs to arise locally. This poses a big challenge for market systems development in cases where the local institutional arrangements are very weak and informal and there are no organisations in place that can take up the role of promoting exploration and solution seeking. These institutions need to evolve locally; development agents can only to a small extent take up their functions or promote specific configurations of institutions, organisations and offerings.

Changing the institutional framework requires challenging and updating dominant beliefs. Dominant beliefs are the beliefs of the groups that have the power to decide which policies are enacted and enforced, or even discussed. Thus development work, also economic development, is inherently political. Without either working with the current elite or working to change who has influence on institutional change, no fundamental, long-term change in economic performance is possible. While this is well known, for example in governance work, market systems development has tried to act in a neutral, apolitical way. The consequences are that interventions will only work if they fit in with existing institutional arrangements and local priorities, which may not allow the priorities of donors, such as pro-poor innovations or inclusive solutions, to emerge as quickly as development time frames typically require. By working in an apolitical way, development projects may legitimise and strengthen current power structures even though they may not be conducive to inclusive economic change in the long term.

What does this mean for the concept of systemic change? Currently, systemic change is often defined as an innovation that is brought to scale in a sustainable way. Inherent in this definition, and particularly the concept of scale, is the idea that a solution to a problem can be scaled and can be traced back to its origins for reporting purposes. This logic is firmly embedded in current definitions of systemic change and frameworks that are used to conceptualise systemic change, such as the Adopt-Adapt-Expand-Respond (AAER) framework. From an evolutionary point of view, crucial aspects are absent from this conception of systemic change and its frameworks. For example, the ability to explore more options, the diversity of things being tried, the ability of actors to come together to make sense of a situation and find contextualised solutions based on local knowledge. Strategies are generally defined as ‘pathways to systemic change’, implying that systemic change is the result of a number of interventions that are causally linked to eventual changes in the wider system – and that this ‘pathway’ can at least to a certain extent be predetermined.

This tendency to take a reductionist view and focus on fixing problems often results in variety being reduced while the ‘ideal’ solutions are promoted. Little attention is given to how interventions influence the evolutionary change process. For example, local efforts to change could be displaced or changes in the institutional arrangements that constrain or create options for individual market actors could be negatively influenced. Equally, little attention is given to changes in people’s perceptions, norms and values that shape these institutions. Finally, little attention is given to who is in power and what these people’s interests are in directing institutional change.

A new understanding of systemic change is needed. But first and foremost, the notion of creating pathways to achieve systemic change denies the fact that systemic change is constantly present; systems also continuously change without external development interventions. A much more dynamic understanding of change in economies and markets and the role of development actors in this change is required. **Rather than to make the change happen, the aim of market systems development must be to enhance the evolutionary process in an economy and create access for all levels of the society to this process.**

To gain this dynamic understanding of change, it is helpful to go back to a definition of sustainable development that is in line with the evolutionary nature of change. Such a definition has been provided by the ecologist and founder of ecological economics, C.S. Holling (2001):

- Sustainability is the capacity to create, test and maintain adaptive capability.
- Development is the process of creating, testing and maintaining opportunity.
- Sustainable development therefore refers to the goal of fostering adaptive capabilities while simultaneously creating opportunities. It is therefore not an oxymoron but a term that describes a logical partnership.

The local system actors are at the core of this understanding of sustainable development. The understanding focuses on creating adaptive capability among these actors and creating opportunities for all system actors that lead to evolution. The concept of systemic change needs to be reframed along the same lines.

This report questions the usefulness of the concept of 'systemic change'. At the same time, it is also recognised that the concept is well established in the market systems community and is widely used. Therefore, rather than to suggest an alternative concept, this report concludes with a reframed definition of systemic change in market systems development:

Systemic change in a market system is characterised by improvements in the quality, value, or extent of economic opportunities for people, achieved while the institutional landscape remains adaptable to future challenges. It is fundamentally an evolutionary process: involving variation, selection and amplification of solutions to complex problems.

Systemic change is most likely to be achieved when influential actors or networks of actors become aware of how change happens, and their role in realising the evolutionary potential of the economy.These influential actors need to develop the capability to engage in, collectively discover and continuously shape their institutional landscape - a process that is most effective when it is done in a transparent and participatory way. Generally all levels of society need access to these processes if people living in poverty are to be included in its benefits.

By implication, it is not sufficient for a development programme from outside the system to improve market access for a particular target group of beneficiaries, like micro / small enterprise, marginalised women or people living in poverty. Rather, the aim should be for the relevant actors in the system to become able to recognise that some groups are left out or that some negative patterns are repeating and react to that.

Essential reading

For readers who are interested in exploring this topic further, we recommend the following literature.

Beinhocker: *The origin of wealth* (Beinhocker, 2006). Beinhocker provides a great synthesis of evolutionary economics and how it differs from neoclassical theories. He covers the process of economic change in detail, and makes a convincing case as to why economies are complex adaptive systems.

Shirley: In *Institutions and development* (Shirley, 2008). Shirley applies the theories of New Institutional Economics to international development. She first explores the current understanding of NIE on how institutions work and then applies this understanding to international development practice.

North: *Understanding the process of economic change* (North, 2005). In this book, North synthesises and integrates several decades of research and writing on the topic of how economies change, and the central role of institutions in this change process.

Snowden and Boone: *A Leader's guide to decision making* (Snowden & Boone, 2007). In this much-cited journal article, the authors make a clear distinction between complex and complicated issues, and outline an approach that leaders can use to improve decision making and strategy.

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