

# WIDE methodology and the Foundations of Knowledge Framework

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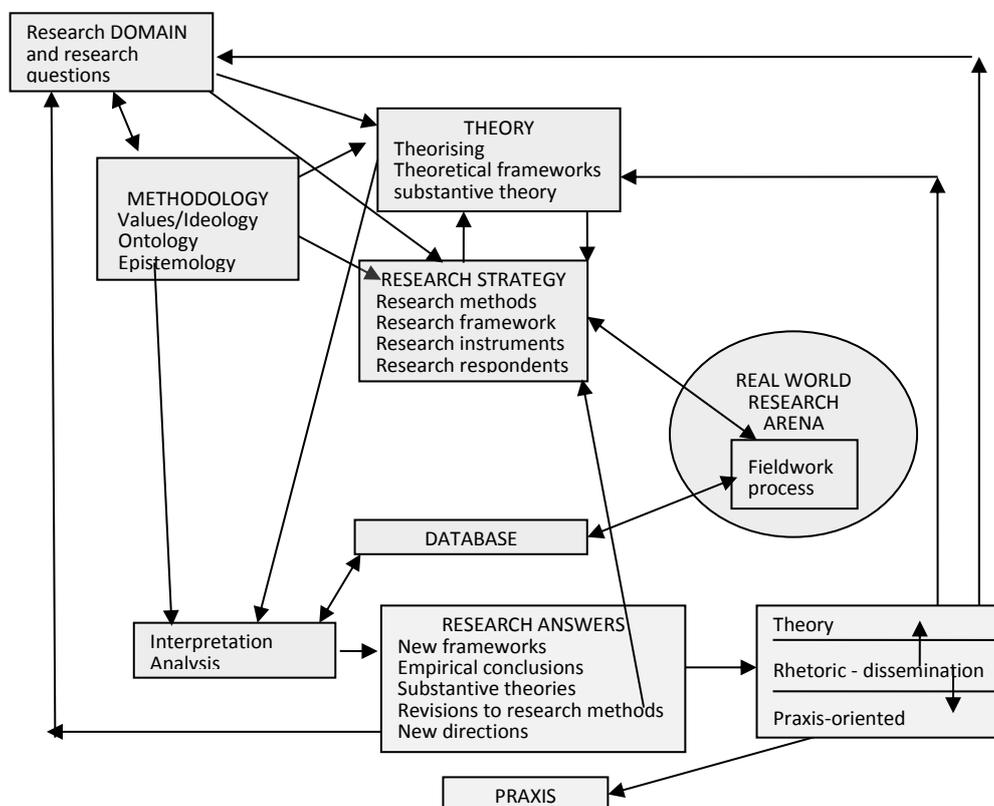
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## The Foundations of Knowledge Framework

Sound empirical research frameworks require transparent philosophical and methodological foundations and those designing research projects should be in a position to justify their choice of stance in nine scientific areas.

Figure 1: The Foundations of Knowledge Framework



These are:

1. Domain or focus of study: what exactly are you interested in?
2. Values/ideology: why are you interested?
3. Ontology: how do you understand the nature of reality?
4. Epistemology: how can you know about that reality?
5. Theory: how do you understand/explain your object of study?
6. Research strategies: how can you establish what is really happening?
7. Research answers: what (kinds of) conclusions do you want to draw from your research?
8. Rhetoric: how do you inform (which) others about your conclusions?
9. Praxis: what to do? who should do it?

The Foundations of Knowledge Framework (FoKF) (Bevan, 2009) shows how these different knowledge areas are linked (Figure 1). In the remainder of this paper we very briefly describe the WIDE3 approach to each of these knowledge foundations.

### **Research domain and ideological position**

The WIDE3 *research domain* is modernisation and change in Ethiopia's rural communities since 1991 with a particular focus on the roles played by development interventions since 2003. Our *ideological* commitment is to empirical research that is (1) relevant for improving the life chances of the poorest and most vulnerable people (2) scientifically important and (3) helps well-motivated practitioners at all levels to understand how their area of intervention really works, including potential unintended consequences of their actions, in order that they can act more efficiently and equitably.

### **Ontology**

#### *The world really is complex*

Our complexity social science approach pays attention to ontology – what is the world *really* like? Complexity scientists like Coveny and Highfield (1995) have provided much evidence that the world *really* is complex. 'The story of the universe is one of unfolding complexity. (p328) ...Energy and chemical elements produced by the stars have led to the emergence of intricate structures as organised as crystals and human brains (p10) ...Life is an emergent property which arises when physico-chemical systems are organised and interact in particular ways. ... A city is an emergent property of millions of human beings (p330)'.

Complexity theory provides a 'framework for understanding which asserts the ontological position that much of the world and most of the social world consists of complex systems ... complexity theory is an ontologically founded framework for understanding and not a theory of causation, although it can ... generate theories of causation' (Byrne and Callaghan, 2014: 8). From complexity ontology we take a number of key messages. Parts are related, inter-dependent and inter-act. Complex systems are characterised by emergence; the whole is more or less than the sum of the parts. 'Emergence means that something new comes into being. We have a change of kind rather than just a change of degree... p 13 .. Emergent phenomena are not explicable in terms of that from which they emerge p18 ' (Byrne, 1998). A simple example is water – H<sub>2</sub>O – a molecule emerging from a combination of hydrogen and oxygen atoms. Degrees of connectivity among parts vary across systems leading to differences in overall resilience and adaptability to external changes. Degrees of connectivity also vary across different areas within one system, affecting the intensity of (negative and positive) feedback processes.

### *Complex social systems are structured and energised by social action*

Dynamic and open complex social systems (DOCSSYs) have material, technological, social, economic, political and cultural dimensions and are constituted by elements in structured relationships. Social systems have nested sub-systems, are nested in larger 'super-systems', and inter-sect and interact with other systems. Each of these systems are constituted by a network of relationships among people playing different roles in the structure.

Social change processes depend on people acting and thinking in new ways; social continuity is found where things go on much as usual. From an 'action perspective' the social structures of the community are *socially constructed* by sequences of social actions and interactions by (historically-made) community members with other people and the place system in the community. However, from a structures perspective people's choices and actions are shaped by the pre-existing structures. Some of these are embodied in people and some are not but manifest for example in material structures, norms, and relationships. Bringing these two perspectives together we can imagine an iterative process as time passes: structures guide but do not determine the actions through which, in the next time period, the structures are reproduced or changed. A third 'relationship perspective' recognises that people do not act alone in the ongoing social construction of open material and social systems and the empirical exploration of these processes must take account of social relationships and inter-actions among the people involved.

Social action can be seen as taking two forms, described here under the headings of *habitus* and agency (Byrne and Callaghan, 2014: Chapter 5). *Habitus* is a system of dispositions or pre-conscious orientations to action arising from regular participation in a structure or network of relationships: through this socialisation dispositions become 'embodied' in people's bodies and minds and when these orientations determine actions people reproduce the world as it is without knowing what they are doing or wanting to do so. For example, a farmer may use the same kind of plough his father used without much thought and a mother feeding butter to her newborn will do it in the way she has seen other women do it. *Agency* describes action based on mental reflexive decision-making processes. People ponder possible courses of action before choosing the one to follow. The farmer decides it is worth experimenting with a broad bedmaker plough, the potential mother wonders what the butter might do to her baby's digestive system. Some actions are almost totally guided by *habitus* and some by agency but many involve mixes and actions that began as agency convert to habitus through regular repetitions. One purpose of many development interventions in Ethiopia is to replace people's customary orientations to action deemed to be 'anti-development' with modern reflexive orientations.

### *Control parameters*

Control parameters of complex systems are those aspects of its internal structure and context which working together as a *configuration* have a governing influence on its state at a particular point in time. Both system and context have other contributing aspects which are not part of the dominating configuration; however, if they change they have the potential to move the system to a different state.

### *Complex social system dynamics*

People are organised in unequally structured co-evolving systems which, in Ethiopia, include, among many others, households, communities, livelihood systems, kingroups, lineages, clans, other community-initiated organisations, formal and informal enterprises, government development interventions, towns and cities, NGOs, political parties, national and international donor systems, government systems, the country system as a whole, diaspora systems, world religious movements, international commodity markets and transnational companies.

Encompassing, encompassed and intersecting systems co-evolve: a change in a key aspect or parameter of one system is likely to lead to adaptation in others. Initial conditions matter and

trajectories are path dependent. Degrees of connectivity can change through time.

## Epistemology

Knowledge is imbricated in historically-changing complex systems, so that what we can know is contingent and provisional, pertaining to a the context we are working in. However, this does not mean that ‘anything goes’. The WIDE team is committed to the institutionalised values and methodological rules of social science which include logical thinking and the testing of ideas against reality through rigorous and transparent empirical enquiry, including in this project establishing an Evidence Base to which we and others can turn if questions arise.

Complexity theory tells us a number of things of relevance about ways to know about complex systems. One relates to system boundaries which ‘are simultaneously a function of the activity of the system itself, and a product of the strategy of description involved... we frame the system by describing it in a certain way (for a certain reason) but we are constrained where the frame can be drawn’ (Cilliers 2001:141). Some complex systems, like rural communities, depend on activities which are spatially based, while others, like development interventions, link the activities of entities which are located in different places.

Social complexity research is usually exploratory, the aim being to identify (1) patterned similarities and differences among the complex systems under study and (2) common processes and mechanisms which play out differently in different contexts, rather than ‘laws’ or generalisations. Frameworks and methods depend strongly on the research questions. There is continuous interaction and iteration between ideas and the field. As explained further below data are seen as ‘traces’ of the passage of the communities and their sub-systems through time. Quantitative data tell you *how much* of the research object of interest there was at the time of measurement, while qualitative data tell you *what kind* of thing it was.

‘More than one description of a complex system is possible. Different descriptions will decompose the system in different ways’ (Cilliers, 2005: 257). As shown below a multiple perspectives framework can generate rich structured datasets which can be used to establish how system, parts and context have worked together.

## Theory

*Theorising* uses the ideas and theories of other scholars; ‘building on the shoulders of giants’. *Theoretical frameworks* are exploratory tools which clarify concepts and identify key processes linking them. The FoKF is one theoretical framework used in this chapter and the others we have used are set out in Section 4. They are developed through theorising and in the dialogue between ideas and evidence and provide guides for the design of research instruments and the interpretation and analysis process. *Substantive theories* are to do with causal understanding or explanation. In complex social systems causation is complex; what happens is usually the result of the interaction of multiple internal and contextual causal mechanisms (Mouzelis, 1995).

A fundamental theoretical framework for understanding longitudinal complexity-oriented research processes distinguishes between synchronic and diachronic analysis. Complex systems evolve through time and their past is co-responsible for their current state. ‘An analysis of a complex system that ignores the dimension of time is incomplete, or at most a synchronic snapshot of a diachronic process’ (Cilliers, 1998: 40).

## Research strategy

Our research strategy depends on *case-based methods* which fit well with the complexity paradigm since they do not depend on any assumption of linearity as most standard variable-based methods

do. Also they can combine qualitative and case-based quantitative interpretation in an integrated fashion. Case-based quantitative analysis uses a conception of measurement that depends on *classification* which fits with the way in which people think. In everyday life we constantly use (stereo)typing to guide our responses to other people and their actions, events and so on. A case-based quantitative approach is contrasted with a traditional quantitative approach where variables (particular features of cases, for example education, income etc) are seen as causal agents while cases (people, households, firms, countries) are seen simply as sites for measuring variables. Analysis of quantitative data becomes a contest between disembodied variables to see which are 'significant'. Byrne argues that the term 'variable' is often used in a way that implies that measurements, such as education measured by years of schooling or income, are substances or forces with causal powers. But variables are not real; '(w)hat exists are complex systems.. which involve both the social and the natural, and which are subject to modification on the basis of human action, both individual and social (2002: 31). What we measure are quantitative traces and what we describe are qualitative traces of the systems which make up reality' (*ibid*: 32).

Byrne also argues that 'integrated accounts constructed around a complexity frame offer the best narratives for describing change (2001:74)'. In order to achieve such accounts he advocates the use of four processes:

1. *Exploring*: descriptive measurement of variate traces and examination of the patterns generated by the measurements in conjunction with exploration of qualitative materials (which might be texts, photos, artefacts)
2. *Classifying*: sorting of things into kinds on a proto-typical basis (Bowker and Starr, 1999) and (temporary) identification of meaningful boundaries of a system or ensemble of similar systems
3. *Interpreting*: measures and narratives in a search for meaning
4. *Ordering*: things sorted and positioned along the dimension of time and procedures for documenting changes and when they occurred.

The research strategy involves using the theoretical frameworks to develop a *research design* which identifies

1. What to ask about.
2. How to ask; including potentially surveys, protocols to guide semi-structured interviews, participation observation, photographs and the collection of documents.
3. Who to ask.

### **Fieldwork and database**

In comparative community research such as this once the cases have been selected and the research instruments designed the *fieldwork* process involves time planning, training of fieldworkers, field supervision, and planning and implementation of the data journey from fieldworker notes to the *database*.

### **Interpretation and analysis**

Comparative case-based analysis of qualitative data can take four forms (Tilly, 1985). One case can be analysed in terms of (1) its location in a larger system or (2) its internal dynamics. Two or more cases can be compared in a search for (3) diversities and/or (4) regularities. We are using all four approaches:

1. *Structural location*: communities are spatially, economically, politically, culturally and historically located in wider complex systems. The relationships which each community has with these encompassing systems have a bearing on both the substance and the style of what happens.
2. *Internal dynamics*: since communities are historically located each is on a trajectory constructed by

the path- dependent actions and social interactions of the actors involved. Community trajectories can change direction as a result of internally-initiated changes, linked internal and contextual changes, or big changes in context.

3. *Diversities and regularities*: increasing interest in case-based research (e.g. George and Bennett, 2005; Byrne and Ragin, 2009<sup>1</sup>) has led to recommended procedures for different types of cross-case comparison to identify common causal mechanisms, produce descriptive typologies sorting cases into different kinds, and typological theory development.

### Research answers, dissemination and practice

There are five kinds of *research answer*: empirical conclusions, new theoretical frameworks, substantive theories, revisions to research methods, and new questions. For *dissemination* these answers have to be presented in *rhetorical* styles appropriate to different kinds of audience; academics, government and donor development policy designers, implementers and evaluators, other practitioners, and hopefully in due course the communities under research, and the general public via various forms of media.

The complexity social science framework is highly suitable for *praxis*<sup>2</sup>-related research. 'Complexity is essentially a frame of reference - a way of understanding what things are like, how they work, and how they might be made to work.' (Byrne, 2002: 8). Policymakers should establish what is possible (and not possible) in the future for different kinds of system/case which they plan to target with interventions.

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<sup>1</sup> The handbook edited by Byrne and Ragin contains examples of a range of case-based methods and techniques including explanatory typologies in qualitative analysis, cluster analysis, correspondence analysis, classifications, Bayesian methods, configurational analysis including Qualitative Comparative Analysis (QCA), fuzzy-set analysis, neural network analysis, choice of different types of cases for comparison (e.g. most different cases with a similar outcome; most similar cases with a different outcome), computer-based qualitative methods, ethnographic case studies, and a systems approach to multiple case study.

<sup>2</sup> 'the process by which a theory, lesson, or skill is enacted, practised, embodied, or realised. "Praxis" may also refer to the act of engaging, applying, exercising, realizing, or practising ideas' *Wikipedia*

Tilly, C. 1985 *Big Structures, Large Processes, Huge Comparisons*, New York: Russell Sage Foundation.

For more on how the Foundations of Knowledge Framework informed the WIDE3 research see the [Methodology Annex](#) to the Stage 3 Final Report.