Collaboration in International Development:

An analysis of Doing Development Differently and

Transdisciplinary Research

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Abstract in English

This thesis addresses the question whether transdisciplinary research (TDR) can be an approach to Do Development Differently (DDD), as defined by the DDD-manifesto, and specifically addresses what implications the different approaches have for the development practitioner.

By conducting two discourse analyses, the paper compares the similarities between the two concepts DDD and TDR. As TDR involves collaboration between local actors around solving locally defined and real-life problems, the thesis found that TDR can be added as an element in the DDD discourse. In order to strengthen these findings, a case study of a TDR project in South Africa was conducted. This case study was investigated through the lens of Actor Network theory, which allowed for an analysis of the different stakeholders involved, the process from a research project to a social enterprise, and the negotiations that followed.

The paper concludes that the case study built on a TDR approach, simultaneously and unintentionally, applied the DDD principles in their work. However, as both concepts are faced with the challenge of becoming rigid when defining their identity, their objectives are open for interpretation and do not provide much guidance for the development practitioner.

Abstract in Norwegian

Denne masteroppgåva svarar på spørsmålet om transdisiplinær forsking (TDR) kan vere ein måte å implementera Doing Development Differently (DDD), som definert i DDD-manifestet.

Med diskursteori som teoretisk rammeverk, undersøkte eg likskapane mellom dei to konsepta. Sidan TDR involverer samarbeid med lokale aktørar og har til føremål å løyse lokale problem, fant eg at TDR kan bli inkorporert som eit element i DDD-diskursen. For å styrke dette resultatet, gjennomførte eg ei case studie av eit TDR prosjekt i Sør Afrika. Case studiet brukte aktør-nettverks teori som teoretisk bidrag, noko som opna for ei analyse av dei forskjellige aktørane som var involvert, prosessen frå forskings prosjekt til sosial verksemd og utfordingane som fylgde.

Denne masteroppgåva konkluderer at case studiet, som var basert på ei TDR tilnærming til utviklingssamarbeid, implisitt innførte prinsippa frå DDD-manifestet. Sidan både TDR og DDD er prega av uklarheit er det opp til den individuelle utviklingsarbeidar å tolke korleis dei kan brukast i praksis.

Motivation

With a Bachelor's Degree in International Development, a variety of international NGO experiences and most recently, an internship at UNEP DTU Partnership, international development is an area of strong interest and something I strive to learn more about.

In 2012 I wrote my bachelor thesis about driving restrictions based on car license plates, and concluded that, in the case of Ecuador, the restrictions did not reduce air pollution due to increased use of cabs; increased inequality as middle and upper class families bought a second car while lower class households were forced to use public transport with high levels of crime. Furthermore the restrictions functioned as a secondary source of income for the police force as they frequently accepted bribery instead of requiring people paying their fines. This system is still running today, and the approach of even odd number plate restriction has become a success story of how to deal with high levels of air pollutants.

The implementation of a blue print approach like the driving restriction, which has lacking or even contradictory outcomes, function as a motivation for a study of how development initiatives can be done differently and give real results. I was introduced to the Doing Development Differently manifesto and transdisciplinarity research by the Head of the Research and Policy in Development (RAPID) Programme at Overseas Development Institute, John Young, and at once felt that the subject integrated both my bachelor's degree, my experiences from the UN and my master's degree in political communication and management. Being part of the launch of the Sustainable Development Goals at the UN City in 2015, I felt motivated to research on *how* to reach them better, and I was interested in learning more about how transdisciplinarity works in the development process.

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Additionally, this thesis would not have been the same without the contribution from the persons involved in the iShack project. I am grateful for all their reflections and experiences. Special thanks to Simon Hearn for putting me in contact with the Sustainability Institute, and Berry Wessels for providing me with the contact information of those involved and an overall overview of the case.

At last, I will like to thank my family and loved ones for always supporting and believing in me.

List of abbreviations

ANT – Actor Network Theory

BNG - Breaking New Ground

BRAC – Bangladesh Rehabilitation Assistance Committee

CSOs – Civil Society Organisation

DCD-DAC – Development Co-operatiion Directorate

DDD – Doing Development Differently

DFID- UK Department for International Development

iShack - Improved Shack

ISN – Informal Settlement Network

ISUG – Informal Settlement Upgrading Group

MDG – Millennium Development Goals

NGO- Non Governmental Organisation

NORAD – Norwegian Agency for Development Cooperation

NRF - National Research Foundation

NUPI - Norwegian Institute for International Politics

NUSP - National Upgrading Support Programme

ODA - Official development assistance

ODI – Overseas Development Institute

OECD – Organisation for Economic Development Cooperation

OPP - Obligatory point of passage

PDIA - Problem-driven iterative adaptation

PEA - Political economy analysis

QI - Quality improvement

RAPID- Research and Policy in Development, ODI

RDP - Reconstruction and Development Programme

SDG – Sustainable Development Goals

SDI – Slum Dwellers International

SI – Sustainability Institute

SNL - (think it might just be a source)

TAF – The Asia Foundation

TD – Transdisciplinary

TDR – Transdisciplinary Research

UISP - Upgrading of Informal Settlements Programme

Contents

Chapter 1: Introduction

1.1 From MDG to SDGs

2015 was the year of goals. The Climate Conference in Paris reached an agreement, the Millennium Development Goals (MDG) came to an end and the Sustainable Development Goals (SDG) were introduced. While some targets under MDGs have been met and over a billion people have been lifted out of extreme poverty, comparative data illustrates how the progress has often been uneven and sometimes even lead to a larger gap between rich and poor (Wild et.al. 2015:14-18.

The goals for the next 14 years are numerous, they are big and they are complex. They require innovative ways of working, partnerships and complex solutions. Yet, they are possible.

International development has been on the agenda for the developing world since end of the Second World War. During the 90´s there was a shift from seeing international development as purely macroeconomic to acknowledging the importance of non-economic factors such as public sector management, public finance and decentralisation. Good governance has for many years been the golden bullet introducing a focus on the underlying, informal institutions of governance and relations of power (Hout, W. 2012: 406). However, the successes of development initiatives in Asia under regimes scoring low on rankings for governance quality, illustrates that transformative change can take place without a comprehensive change of institutions and power structures (Booth 2016).

1.2 Problem area

Much of the discussion in the development sector today concentrates around the question of how to establish a better understanding of the informal and political context in order to better foster real results for development initiatives. The trend is to lean towards a framework of developing country-led, inclusive partnerships that are results-oriented, which emphasise coordinated participation and which are adapted to local conditions and partners (Michel 2013:6). Doing Development Differently (DDD) is a community active in the debate on how development can be done differently to ensure successful initiatives and real results for real people. Simultaneously, there has been increased interest in a transdisciplinarity (TD) approach to international development both within the Research and Politics in Development Programme (RAPID) at ODI and in other organisations like the Network for Transdisciplinary Research (td-net) in Switzerland and the Sustainability Institute in South Africa. These two approaches to development are the overarching themes for this thesis, and will thus be introduced in the following section.

1.2.1 Doing Development Differently

Doing Development Differently characterizes itself as a community of over 400 signatories from 60 countries. It offers a forum for discussion, a blog for publications and is described as an arena for discussion, where participants can share experiences, support and inspire each other. In late 2014, the community developed a manifesto, introducing six principles based of experiences of the community, of what works when doing development.

Box 1: DDD Manifesto

The Doing Development Differently Manifesto

- Focus on solving local problems that are debated, defined and refined by local people in an on-going process
- Legitimise reform at all levels (political, managerial and social), building ownership and momentum throughout the process
- Work through conveners who mobilise all those with a stake in progress (in both formal and informal coalitions and teams) to tackle common problems and introduce relevant change
- Blend design and implementation through rapid cycles of planning, action, reflection and revision (drawing in local knowledge, feedback and energy) to foster learning from both success and failure
- Manage risk by making small bets: pursuing activities with promise and dropping others
- Foster real results – real solutions to real problems that have real impact: they build trust, empower people and promote sustainability

1.2.2 Examples of DDD in practice

The DDD community has published several case studies that illustrate how these principles work in practice. One example is a study from the The Asia Foundation (TAF) and USAid-funded project introducing a reform to secure property rights in the Philippines (Booth 2014). The enactment of a law on Residential Free Patents in 2010 resulted in a 1,400 percent increase in residential land titling, with a number of benefits for urban dwellers.

One of the key features identified for success was that the project was adaptive, iterative, politically smart and collaborated with local key change agents. By not having a clear mandate in the beginning for what the formula for success would be, two working groups of motivated individuals and activists where given flexible space to explore how to side-step major opposition and generate support for the law (Booth 2014). They went for the second best option and focused only on residential land and was able to mobilise the influence of organisations that perceived the reform could be in their interests. The team identified a set of key players that could potentially use their political capital to influence the legislation process. The building of the coalition supporting the bill, was not constrained by donor

requirements or good practice principles as TAF played an intermediary role ensuring trust in times when little happened (ibid.).

1.2.3 Challenges for translating the principles into practice

Even though the above cases illustrates the DDD principles in practice, the translation from principles to practice seem to meet certain constraints. In example, UK´s department for international development (DFID) has implemented a set of Smart Rules based on being adaptive and flexible, including beneficiaries in the design and implementation, and thinking politically, however to go from words to action, may be more complicated (Wingfield & Vowles 2014). Wild et.al (2015:27) suggests that one of the challenges of changing the development practice to DDD, is the idea that solutions have to be discovered and not pre-defined may be scary for many, especially for officials who have to make decisions on how to spend limited resources and for politicians who are accountable to their voters. The paradox of being accountable to donors and voters, while working in flexible, iterative and politically smart ways over extended periods is difficult for project implementers, yet case studies has shown that the tension can be managed (Booth & Unsworth 2014: 24). Another challenge to putting the principles into practice may be that few development workers have an understanding of what it would imply for their daily work on the ground (Wild et.al 2015: 27).

1.2.4 Who creates the evidence about the world?

While many of the DDD principles underline the importance of understanding the local political environment, adapting to local context, doing what is politically feasible and involve local stakeholders in the process, less work is made on what evidence feeds into these processes or how that evidence is produced. A think piece from Lisa Denney and Pilar Domingo (2015) turns the gaze on themselves as researchers and highlight that researchers and experts (mainly from the American or European universities or think thanks) have significant power in the production of evidence around the world, in comparison to researchers from African universities. Furthermore they emphasise the role of donor agencies in setting the standards for good evidence and defining the research by its budget, in example DFIDs How To Note on assessing evidence (DFID, 2014). This is in line with what Fischer and Marquette (2014) describe as the industry of political economy analysis[1], which does not build on the local knowledge about a given subject but rather reflects what the donors are requesting as evidence.

[1] A widely recognized tool to inform and improve development initiatives, is political economy analysis (PEA) seeking to reveal the formal and informal factors of a country´s political and economic environment. However, studies has found that linking the findings from PEA to action is constrained by donor agencies internal factors (Booth, Harris & Wild 2016). A review of DFID´s Driver of Change program launched with the incentive to understand the PE environment at country level, revealed limitations of the program regards to lack of consistency in methodology and quality across the studies (DFID 2009:10) and others have illustrated that few of the studies where integrated into country planning processes, and if the studies arrived at specific recommendations for donors, the timing was off (booth, Harris & Wild 2016). Fisher and Marquette (2014) argue that PEA has evolved to

1.2.5 Transdisciplinarity research

A way to avoid donor-driven research and pre-defined solutions is transdisciplinary research (TDR), which promotes collaboration between research and industry, between different disciplines and between different research organisations and stakeholders (Harris & Lyon 2013).

Within the last fifteen years, the amount of publications related to transdisciplinarity have increased rapidly. The Swiss organisation TD-net is doing a yearly analysis of publications in the field of TD and interdisciplinarity. In 2002, TD-net registered about 2000 publications; whereas in 2013 the number had increased almost to 12.000 (TD-net). The rapid increase in publications illustrates a growing activity in the field of TDR, which is also illustrated by a growing number of international networks focusing on the study of TD as a research topic in its own right, in example the International Centre for Transdisciplinary Research (Stokols 2006:67).

1.3 Research question

With the DDD principles as an overall framework, I will investigate TDR as an attempt to concretize what DDD entails in practice. I will analyse the resemblances between the principles underlining the Doing Development Differently manifesto and the process of transdisciplinary research methods. Based on the initial research, I created the following hypothesis:

> *By involving local stakeholders and solving societal, local problems, transdisciplinary research is a way to Do Development Differently as defined in the DDD-Manifesto.*

In order to investigate the hypothesis, I have constructed the following research question:

> *How applicable is transdisciplinary research as a methodology to Do Development Differently as defined by the DDD-manifesto?*

As assistance in answering the research question, I have constructed the following sub-questions which will be guiding my analysis.

- What are the similarities between DDD and TDR in the context of international development?
- How are the objectives of TDR applied in the iShack project, and how did the transformation from a research project to a social enterprise unfold?
- What are the implications for the development worker when applying DDD and TDR in their work?

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a risk assessment tool to identify risky sectors, red flags or easy win opportunities for donors, rather than contributing to a deeper understanding of the local context.

1.4 Contribution to the existing field of research

The existing literature on transdisciplinarity does often reflect the researcher's point of view, and Christian Pohl (2010:78) said it would be interesting to learn about TD from other than the academic perspective, in example an actor from the civil society or the private sector. In the same vein, Harris and Lyon (2014:19) call for research on the view of different participants in the process. This paper is thus motivated to illustrate how the process of TD is viewed by the various actors involved in the different phases of TDR. Furthermore, Wild et.al (2015:8) calls for more attention directed towards the methods to implement the SDG agenda. I therefore seek to provoke debate around TDR as a approach to apply principles underlining the DDD agenda by both providing an understanding of the local context and collaborate with domestic actors. Additionally, Cash et.al. (2003) call for experience-based guidelines based on demonstrated success or failure in TDR (in Lang et.al 2012:26), which inspires me to draw out what can be learned from the case study.

1.5 Delimitations

The development sector today is characterised by a number of different actors, including bilateral, multilateral and private donors, implementing agencies, research institutions, think thanks and other knowledge intermediaries, NGOs, advocacy groups and CSOs. Many of these have different views on what works or not when doing development, however in this thesis, I will only be examining DDD and TDR. Further, by only focusing on TDR, I have excluded other theories of knowledge co-production, such as community based participatory approach.

By using only one case study, there is little ground to generalize what works and not, yet in such a complex world, this is a rather impossible task. This paper therefore does not seek to identify another best practice for international development, nor to define how “good” knowledge ideally is produced.

1.6 Reader’s guide

Chapter 2 presents my approach to the theory of science. First, I present the epistemological approach to construction of meaning in the world. Second, I will introduce central elements from the discourse analysis of Laclau and Actor Network Theory, and their consequences for the analysis.

Chapter 3 introduces the qualitative research methodology and the empirical data.

Chapter 4 presents the analysis of the relationship between DDD and TDR. Through a discourse-inspired analysis, I will explore the meaning of both concepts.

Chapter 5 presents the case study of TDR in practice. By applying concepts from Actor Network Theory, I will analyse the transformation from a research project to a social enterprise and the negotiations that followed.

Chapter 6 introduces a discussion of the findings from chapter 4 and 5, the implications of DDD and TDR for the development practitioner and offer suggestions for further research.

Chapter 7 presents the conclusion of the research question and the thesis.

Chapter 2: Analytical strategy and theories

After presenting the problem area and research question in the above section, this chapter will introduce the concept of analytical strategy; central concepts from the discourse theory of Ernesto Laclau and Actor Network Theory; and their analytical implications for my observation.

2.1 From methodology to analytical strategy

Andersen (1999 and 2003) suggests we need to move from ontological questions seeking to answer *what* exists in the world, to an epistemological approach questioning *how* something comes into being. By asking epistemological questions, I am working with an empty ontology, as the nature of the object is not given (Andersen 1999: 14). The analytical strategy is therefore the tool and framework for how I shape and situate the view on the social world from my own position in the social world. The view is contingent, which means that it identifies a certain reality that could have been structured differently if another theoretical framework had been applied (ibid.: 13). This means that the analytical strategy has consequences and other consequences would have become visible by using other theories (ibid.: 13). In other words, the choices I make as a researcher construct the object of study in a specific way and therefore set the framework for how the object can be studied (Esmark, Lausten and Andersen 2005: 10). For Andersen (2003:94), this is what analytical strategy is all about; "c*hoosing a way of seeing and accounting for its implications regarding the way the world appear and not appea*r".

2.2 The theory of second order observation

When working with an empty ontology, I strategically apply a theory as a program for a second order observation (Andersen 1999: 19). The theory provides the basis for how I observe, how I construct the object as an object and how I as the observer becomes visible as the observer (ibid.: 11). As an observer, I do not exist before the observation itself, but are given existence through the observation (Esmark, Lausten and Andersen 2005: 10). A second order observation is an observation of an observation like an observation. It becomes possible for me as the observer, to observe what the first observer does not observe (Andersen 1999:11), and it is always possible to observe the second order in a different way (Andersen 2003:94). The strategic analytical decisions for how I observe the observation as an observation are explained in the following sections.

2.3 Laclau and analytical consequences

In the first analysis, I will apply central concepts from Laclau's discourse-theoretical contributions to analyse the concepts of DDD and TDR. I chose to not apply the theory of conceptual history by Reinhart Koselleck, for the reason that while Koselleck´s primary concern is the genesis of concepts, Laclau offers a theoretical framework to analyse DDD as a social movement, or a discursive opposition against status quo and is therefore more suitable for the ambition of this thesis. I start by analysing how the DDD

communication constructs a boundary between the status quo of development and DDD, and how this boundary contributes to stabilise the identity of DDD. Thereafter, I will analyse what TDR scholars bring into the field of knowledge production, by analysing their communication as articulation seeking to stabilise the meaning of TDR as a floating signifier. I will conclude the analysis by analysing a relation between TDR as an element in the DDD discourse. The selected concepts and their consequences are explained in the following section.

2.3.1 Guiding distinction for observation

When applying discourse theory as a frame for observation of second order, the guiding distinction is discoursivity/discourse (Andersen 2003:95). Discoursivity is understood as the way in which objects, subjects and other identities are given meaning in relation to other identities, e.g. "developing" in relation to "developed". However, these relations are not necessarily fixed. When I observe discoursivity, I therefore observe relations that are floating or not fixed (ibid.:50). Observation of discourses on the other hand, calls for an observation of relations between elements that are (partially) fixed. Laclau defines a discourse as a "structural totality of differences" (Andersen, 1999:89). This definition is a reconstruction of Foucault´s concept of discourse, which observes a discourse as a regularity in the diversity of statements, where statements function as the steppingstone of the discourse and should be analysed in their positivity, as they emerge (ibid.:40-44).

Laclau is considerably more open than Foucault when it comes to which discourse can become the object for a discourse analysis (Andersen 1999:109), and the identification of partial fixation of the analysed discourse is up to the observer of second order. As the researcher, my first point of observation is the DDD community, and I condition my observation based on observations regarding 1) the way forward for development practice and 2) what the DDD observe themselves as different from. An overview of the empirical data collected for the analysis is available in the annotated bibliography in Appendix X. My second point of observation, is the different scholars seeking to stabilise the meaning of TDR. This is based on the literature described in Appendix X.

2.3.2 Articulation, elements, nodal points

In order to observe observations as discourses or discoursivity, I will apply the concept of (re-) articulation. Articulation is the practice that establishes relationships, i.e. differences or similarities between different elements (Andersen 2003:50) and will in this thesis be analysed by observing written publications as articulation. Discursive elements are understood as differential elements of practice and utterances, which creates their identity by being different inside the discourse. While being different, the elements are also equivalent to each other as they belong to the discourse and are located within the boundaries of the discourse. The discourse is held together by a central element, called a nodal

point. A range of elements gather in a chain of equivalency surrounding the nodal point in pursue of giving it meaning (Andersen 1999:94-95).

2.3.3 Antagonistic boundaries and equivalence

In order to analyse the boundary between the DDD-discourse and what it seeks to be different from, I will apply the concept of an antagonistic border. The boundary between differences can never be neutral, as it is antagonistic and always will include an exclusion (Laclau 2002:137). The condition for exclusion is that what is excluded is reduced to pure negativity, to a threat for the system of relational differences. Without the threat, the boundaries of the system would not exist. The excluded categories give up the differences and create a chain of equivalence of what the system makes demonic to give itself meaning (Laclau 2002: 138). It is thus my understanding that different elements on each side of the antagonistic border, are related in a chain of equivalency as they can *not* signify what the other side signifies. When observing the communication as articulation, I will therefore also observe what the discourse constructs as "the other" in order to construct it´s own identity.

2.3.4 Floating signifiers

Central in the theory, is the vision that the structure between the signifier and the signified is incomplete and contingent. Laclau deconstructs Saussure´s notion of signs as the unit of the difference between the signifier and the signified, e.g. between c-a-t/cat. Instead he suggest that the signifier and the signified cannot have a fixed relationship to each other, as this incompleteness is what enables the political (Andersen 1999:93-94). In order to analyse the concept of TDR, I find it useful to apply the concept of floating signifier which opens for an observation of signifiers that have different, or no agreed upon signification, and additionally observations of the different articulations seeking to stabilise its meaning[2].

[2] The floating signifier is closely connected to the concept of the empty signifier, which Laclau uses to describe the element in a chain of equivalency that is emptied of meaning in order to represent the whole chain of equivalent

2.4 Analytical considerations of Actor Network Theory

Based on the findings from the first analysis, I will apply central elements from Actor Network Theory in order to analyse how the ambitions of TDR are applied in practice in the case study. I will start by applying the sociology of translation in order to analyse the different actants that contributed in the knowledge production process. Thereafter, I will analyse the negotiations that followed when implementing the solution, before I apply the concept of technology from Akrich (1990) to analyse how the solution introduce more complexity. Central in this analysis is the concept of inscription device, defined by Latour & Wololgar (1986:51) as a device that transforms material substance into a figure or a diagram; here understood as something that integrates different forms of knowledge into a joint solution. In the following section, I present the concepts and their analytical consequences.

2.4.1 A social and material collective construction of the world

ANT was introduced in the 1980s by Bruno Latour, Michel Callon and John Law (Ratner 2013:37-38) and has been successfully applied to fields as diverse as collective action in African cities (Ernstson 2012); Finnish-English translation (Hekkanen 2009): mouth and claw disease (Law & Singleton 2014) and inclusion in the Danish school system (Ratner 2013).

What is particular about ANT is that it gives up the traditional border between nature and society (Ratner 2013:39). The distinction is made quite clear in the following quote by Law and Bijker(1992:290): "*Purely social relations are found only in the imaginations of sociologist, among baboons, or possibly, just possibly, on nudist beaches; and purely technical relations are found only in the wider reaches of science fiction*". Instead, the boundary between nature and society is constructed as a negotiation process (Andrade & Urquhart 2010:355), in which the researcher can observe how a range of different actors, both human and non-human, collectively construct knowledge and science (Ratner 2013:39). When applied to analyse TDR, it opens for an analysis of the knowledge constructed by a network of academic and non-academic stakeholders, also including non-human actants like the research budget or the location where the research takes place.

2.4.1 Guiding distinction for observation

When applying ANT, the guiding distinction is translation/association and I as the researcher ask questions concerning how ideas, technologies or practices are spread by being associated with other ideas, technologies or practices, in such a way that they form a network (Andersen 2003:125). For analytical strategy, this implies that I observe how different actants construct socio-technical networks through translation and association. The network is constructed based on my observation, and is therefore simultaneously a second order observation of how the actants observe, and a first order observation of the network constructed through my observation. Instead of observing invisible social

factors (like Bourdieu habitus or functional systems Luhmann), I will observe iShack as a result of heterogeneous networks (Ratner 2013:50).

2.4.2 Actants

In ANT, an actant is not to be understood as the traditional human individual that behaves intentionally (Latour 1990:7). An actant is something that acts or to which activity is granted by others (Latour 1990:7) such as the driver of a bus or an odd number on a car license plate (Dankert: n.d.). Actants do not have predefined features, but are transformed when being included in a network as the network provides the actants with interests, roles and competences (Ratner 2013:43). Actants have in common that they have agency, they have the power to change other actants and the network (Dankert: no date). ANT highlights the importance of non-human actants as they provide a framework for, enable or translate social interaction, e.g. the use of headphones in an open office space or the use of Skype for a business meeting. In the case study I can therefore analyse dwelling intervention as an actant with the agency to enrol other actants in a network.

2.4.3 Networks

A network in ANT is not to be understood as a social network in its traditional definition (Hekkanen 2009:8) nor a technological network like a telephone network (Latour 1990:2). A network is constructed when a connection between actants is established; e.g. the scientific fact is only evident in the relationship to the scientist, a selection of genes and the research publication. A network is not to be considered as a structure that creates a frame for the actants (Ratner 2013:41), because when the interaction between actants ends, the network will break down (Danert: no date).

As the network changes when new actants are connected, it is dynamic and can therefore provide the researcher with the analytical tool to analyse what kind of connections exist or emerge between agents. When applying ANT, one can analyse concepts that are not naturally observed as networks, as networks, for instance “knowledge” or “innovation” (Ratner 2013:41-42). An actant can be a network and a network can be an actant, the decision is up to the researcher. I will start by analysing iShack as a network of different actants, before I analyse iShack as an actant able to enroll a set of new actants and by doing so, also transform.

2.4.4 Starting point for the analysis

In actor-networks in the scientific field, it is typically the scientist that initiates the network, by applying for funding, doing the research and writing the publications, yet all the actants in the network participate and impact the results (Ratner 2013:40). For the reason that TDR is based of collaboration surrounding a real-life problem, one could potentially identify other non-academic actants or even the problem as the initiator of the network, however, Andrew et.al 2012 claims that a problem needs to be identified as a problem before it is observed as a problem and therefore, the starting point for the

analysis will be the research group that emerged at Stellenbosch University. As the researcher, I construct the starting point and impact which actants are involved in the network. The network could therefore have been different if there were different actors connected in the network (Ratner, 2013:51).

2.4.5 Translation

Central in ANT is the concept of "generalising symmetric principle" which requires the observer to use a single repertoire when describing different phenomena. The most common repertoire is *translation*, defined as "*during which the identity of the actors, the possibility of interaction and the margins of manoeuvre are negotiated and delimited*" (Callon 1986:4-6). Translation means that something is shifted and therefore changes (Ratner 2013:47).

The four moments of translation will be explained by drawing on Callon's (1986) analysis of the network that emerged around the conservation of scallops in St Brieuc Bay in France. Scallops were fished in three locations in France, but in the 1970s the stock was progressively reduced. This was due to a series of hard winters lowering the average temperature of the water, the threat of starfish, and fishermen collecting scallops all year round without allowing them time to reproduce. In St Brieuc Bay the reproduction of the stock decreased less than in the other two locations. The starting point for Callon´s analysis is a conference in 1972, where members from the fishing community and scientists gathered to discuss how to deal with the declining stock of scallops. Callon starts by following three researchers who return from Japan with knowledge about how scallops are being cultivated there.

2.4.5.1 Problematization

The first moment of translation is problematization; where actants (re) define a problem in such a way that, different actants become part of the network of the problem (Ratner 2013:48). Callon illustrates how the researchers write a series of reports and articles drawing on their knowledge about how the problem is dealt with in Japan, and ask questions whether the same procedure could be implement in St Brieuc Bay. They determined a set of actors; the fishermen, the scientific colleagues and the scallops in St Brieuc Bay, and also establish themselves as researchers with the goal of advancing the existing knowledge concerning scallops (Callon 1986:6-7).

2.4.5.2 Obligatory point of passage

During problematization, the main actant often constructs an obligatory point of passage (OPP). Callon illustrates how the researchers establish themselves as an OPP in the network by giving the actants the interest of admitting the proposed research programme. If the scallops want to survive; if their scientific colleagues want to advance the knowledge; if the fishermen want to secure their future income – then they must answer the research question and acknowledge how an alliance around the question can benefit them all (1986:8).

3.4.5.3 Interessement

The second moment of translation is called interessement; the activities where the actants identified during one actant´s problematization, either accept and become integrated into the initial plan, or refuse the transaction by defining their goals and identities in a different manner (Callon 1986:8).

This is where power struggles start as the attempts to get actants interested, can also be rejected by the actants (Ratner 2013:48-49) and other actants external to the network can also seek to define their identities in competitive ways (Callon 1986:9). In the bay of St Brieuc, the researchers used a mechanism from Japan to collect the scallops in a net allowing free flow of water while preventing the young scallops from escaping and protecting the larvae from predators (starfish, currents and the fishermen). This functions as the device for interessement for the fishermen and scallops, whereas the research community is interested through conferences and publications (ibid.:9-10).

2.4.5.4 Enrollment

If interessement leads to success, meaning the identity of the actors are stabilized by the actor's actions, this can lead to *enrollment, which* designates the device by which a set of interrelated roles is defined and attributed to actors who accept them. It is describing the group of multilateral negotiations, trials of strengths and tricks that accompany the interessement and enable them to succeed (Callon 1986: 8-14). If the scallops are to be enrolled, they need to be willing to anchor themselves to the collectors. This action is challenged by the current and parasites, in which the researchers need to negotiate with to secure that the larvae will anchor themselves in a significant manner. This leads to further negotiations with the scientific community to get them to observe the experiment as convincing and significant. (ibid.).

2.4.5.5 Mobilisation

Mobilisation is when an actant becomes the spokesperson for the whole network (Ratner 2013:49). At first the actors were not easily assessable and dispersed – then the researchers defined their roles and designate a spokesperson – so that the actors are first displaced then reassembled at a certain place at a particular time (Callon, 1986:14). The fishermen and the scallops in St Brieuc Bay are represented by three researchers who speak on their behalf. The scallops are transformed or displaced into larvae – into numbers, into tables and curves on papers. This means that the researchers, instead of bringing the larvae to their colleagues, can present their findings in documents. Additionally the fishermen and the experts have been displaced from their natural homes to a conference room. The enrollment is transformed into active support (Callon 1986:15).

Whether the support is likely to last depend on the actants. After three years of research in St Brieuc Bay, the experiments results in catastrophe – the larvae refused to enter the collectors. The larvae which anchored in the initial phases can no longer represent the stock of scallops, and the larvae are

detached from the researchers network. Further, two years into the project, some of the local fishermen betrayed their elected representatives from the fishing community and the long-term goal of the project by fishing scallops that had been collected and regrouped in a protected area (ibid.16). Also the scientific community and the researchers start to question the significance of the project and whether anchoring is an OPP to solve the problem. A stabilized network requires the four stages to be realised in full (Andrade & Urquhart 2010:359) and in the case of St Brieuc Bay, the translation failed (Callon 1986:1). The robustness of a network is related to the concept of alignment: "*alignment is a relative measure of the extent to which the agendas and interests inscribing into the practices, institutions and strategies pull in the same direction, and serve the same purpose*" (Braa et.al.2004:342). The higher the degree of alignment, the more robust and enduring the network is.

As the translation does not necessarily go through all four moments, it is important for me to observe what is at stake in the empirical data. It is for instance possible that one moves backward to an earlier phase, if there is conflict in the network (Ratner 2013: 49).

2.4.6 The black box in ANT

Latour introduced the concept of the black box to describe networks that are taken for granted and processes of translation which do not provide opportunity for conflicts. By observing the black box as a stabilised network, the researcher opens up for an observation of the different struggles to stabilise it as an artefact (Ratner 2013:42). For example, one can observe a mobile phone as a black box, in the sense that the user only needs to know the input (a phone number) in order to achieve the output (dialling the phone number). The complexity of the different actors involved in stabilising the mobile phone are reduced, so the user does not need to understand the technology behind it, the different actants who have been involved in developing it, or the different laws regulating it, etc. in order to use it. By opening the black box of the evidence produced in the case, I will be able to analyse the different kinds of knowledge that participated in stabilising the network as a fact.

2.4.7 Technology in ANT

The concept of black box is closely linked to the concept of technology. Madeleine Akrich (1992) introduced how much of the work of innovators or designers in technology, is to inscribe a certain vision of the world and its relation to the technology. This vision is called a *script*, and contains assumptions about how the actors, science, economy and other, will evolve in particular ways when the technology is introduced (p.208). In the script lays a *pre-scription* of the user, often manifested in contracts, user manuals or similar, which provides a framework of action for the technical object, the actors and the space in which they are supposed to act (ibid.). However, when the technology is implemented in the real world, the script may be challenged during *de-scription,* the moment when the technology and the user as designed by the script, are adjusted to the real user in the real world (ibid.:209 & Ratner

2013:170). When the technology becomes stabilised between the prescription, script and description, it can be observed as a black box (ibid).

2.5 The two theories combined

After presenting the two theoretical frameworks for this thesis, I will attempt comparing them. Both theories can be used to observe how the world is constructed through relations, i.e. relations between different elements in a discourse and relations between actants in a network. Furthermore, both theories give up the idea of society as an entity. In Laclau´s discourse theory, the social only exists through articulation; everything is contingent and meaning is never fully fixed. In ANT the social only exists through relational networks of actants, which are contingent, heterogeneous and in which the agency of the actants are constituted within, rather than prior to such networks (Routledge 2013:70-72). In ANT, translation transforms by connecting actants that were not connected before, which is similar to Laclau's concept of articulation, which (re-) connects different elements. Whereas articulation opens for the analysis of discourses or hegemonic struggles, the researcher in ANT focuses on the transformation itself by analysing the translation through four different moments.

The discourse theory provides the necessary tool to analyse the relation that stabilises between different elements in Doing Development Differently and open up for a relation to Transdisciplinarity Research Instead of analysing this output further by deconstruction, e.g. deconstructing the logic of the representative in Enkanini, it is my understanding that ANT presents a more suitable framework to analyse the different negotiations and associations that emerge between actants when the TDR project is introduced. By applying ANT I am able to analyse how the municipality and the residents became connected through the TDR project and the technology it offers. Further, ANT opens up for an analysis of the kind of knowledge the different actants contribute with in the network, and all actants are given equal power to change the network.

Chapter 3: Research methodology and data

Based on the character of the research question, I have chosen to use both primary and secondary qualitative data as the fundament for the thesis. This chapter will present the qualitative methodological approaches of document review, case studies and interviews and explain how it contributes to the research agenda, before I address the potential weaknesses of the approach and the limitations of the study/data gathered.

3.1 Qualitative document review

A qualitative content analysis makes it possible to search for specific content in a selection of documents. This approach builds on "a systematic reading of documents with the intension to categorize the content and register the data relevant for the problem area" (Grønmo 2007: 187). By systematically investigating the existing literature on DDD and TDR, I will gain an in-depth understanding of the problem area, a better background to define a research question and defining the case study design.

Much of the literature concerning DDD was collected from the ODI and DDD website. An annotated bibliography over this literature is attached in appendix 1. To gain in-depth understanding of the concept, I also arranged discussions with people central to the DDD community located at ODI in late January. The TDR literature was collected based on the search words: c*o-production knowledge, mode 2 knowledge, knowledge production, transdisciplinarity, TDR.* To create an overview of the immense topic, I created an annotated bibliography attached in Appendix 2. While collecting and analysing this secondary data, I have made critical considerations regarding the relevance, quality, accessibility and authenticity of the data (Grønmo 2007:136).

3.2 Case study

In order to analyse TDR in practice, I will use a case study, defined as "an empirical inquiry about a contemporary phenomenon (e.g. a case), set within its real-world context – especially when the boundaries between phenomenon and context are not clearly evident" (Yin 2009: 18, in Yin 2015: 4). The more complex and contextualised the objects of research, the more valuable the case study approach is regarded to be (Scholz t.al 2006:229). Additionally, case studies are applicable when addressing either a descriptive or explanatory question (ibid.:5) and therefore suitable to describe the actors involved in a TD process and explore how the TD process unfolds in the specific case. I also find the case study approach suitable when applying concepts from ANT, as the theory calls for in-depth information gathering.

3.2.1 Case study selection criteria

The first step in a case study is to design the case you are studying. I constructed the following case selection criteria:

- Well documented and access to interviewees
- Use of transdisciplinary research methods (based of RAPIDs definition)
- Have documented impact or show progress to impact
- Reflect either;

1) Operational development projects with *problem origin* or

2) Development project with *research origin*, seeking to inform policy

I used my network at ODI to identify potential cases for my study. To provide as much certainty as possible within the given timeframe, I wanted to analyse a minimum of three cases, based on the assumption that: "*the more cases (or experiments), the greater confidence or certainty in a study's findings: and the fewer the cases (or experiments), the less confidence or certainty*" (Yin 2009: X). From the network at ODI I identified a range of potential cases and conducted several initial interviews in order to investigate if the cases fit the above criteria.

However, I have had certain difficulties with the identification of useful cases for my study. One of the reasons for the difficulties, was that I wanted to have access to interviewees representing the variety of stakeholders involved in the TDR process. In the context of Indonesia, for example the willingness from politicians to participate in a study would be dependent on considerable engagement from the project management in Indonesia, which would require them to invest resources (e.g. personal time and political good will) into my research project. Further, as TD has a variety of definitions, I soon learned that what some might characterise as a TD project, may in fact only be a project based which include collaboration with stakeholders other than researchers, donors and implementers.

After considerable efforts in identifying case studies that fit the criteria, I had to take the time limitations into account and decided on basing my research on only one in-depth case study. One advantage of focusing on one specific case, instead of multiple, is that I have sufficient time to get extensive insight into the empirical data, which also is in line with the Actor Network Theory applied to analyse the data.

3.2.2 Data in the case study

The case study evidence is both primary - collected from semi-structured and open-ended interviews, and secondary – collected from documents such as the Sustainability Institute master, the Enumeration Report, the South African government Housing Policy, the Policy Brief from iShack to the Green Fund and a few articles from South African media. Most documents were provided by the interviewees, others collected through institutions websites and search engines.

3.2.3 Qualitative interviews

From January to end of March, I conducted a range of scoping interviews with stakeholders from potential TDR projects. These were all open-ended and oriented towards determining if the projects fit the criteria or not. Additionally, I had discussions with intellectuals from the DDD community oriented towards getting a better understanding of the status quo of the movement.

In addition to the initial scoping interviews and discussions, I conducted a total of nine interviews during the period from early March to mid-April with actors central to the development of the iShack project. By conducting qualitative interviews, I pursued nuanced descriptions and perceptions of meaning, not quantified but personal observations from the interviewees (Kvale & Brinkmann 2009:48). The interviewees where identified in collaboration with my contact person, Berry Wessels. Before our initial scoping interview, I read parts of the documents described in section above in order to get an overview over the project and the different stakeholders involved. Wessels added stakeholders who had joined since the publication of the documents and provided me with the necessary contact information. In appendix 3 you can find an overview of the interviewees, their affiliation and the time and space for the interviews. I conducted interviews with four academic stakeholders (defined as affiliated with the University of Stellenbosch) and five non-academic stakeholders (defined as external to Stellenbosch University).

To guide the interviews, I created an interview guide attached in appendix 4. This guide was semi-structured, i.e. neither an open conversation nor a closed questionnaire (Kvale & Brinkmann 2009:45) but included open questions structured after the themes: the interviewees role, expectation and motivation; the TDR process, the knowledge co-production; the challenges that emerged; and lessons learned. As I interviewed people with quite different roles in the project, I adapted the interview guide prior to each interview. All the interviews were coded based on the above-mentioned themes, in order to systematize and get an overview over the collected data.

The interviews were conducted over Skype, and one in person in the UK. Eight out of nine interviews where recorded and transcribed. One interview was not recorded due to technical difficulties, however I wrote a transcription of the interview immediately after conducting it, with the conversation fresh in

memory and assistance from interview notes. Permission to record was given by all interviewees, and the interviewees who requested it, were sent quotes in context for approval. One interviewee was given the pseudonym "project manager NGO".

3.3 Limitations of the methodology

This section describes the constraints and limitation of the applied methodology. Due to poor access to Internet and poor telephone signal for international calls, one limitation of the interviews is that I was not able to conduct interviews with residents of the community. The geographical distance made physical visits in the community difficult. As an alternative, I chose to include a video produced by an external organisation and not yet published, but provided to me by the project manager. This video profiles Daniel, a local resident who has been involved in the project from the start. Further, I did not succeed in getting access to interviewees from any of the funding organisations, the National research Foundation (NRF), the Gates Foundation or the Green Fund. Whereas the Gates Foundation responded they unfortunately could not provide any additional information than what was available on the website as the grant had ended, neither the NRF nor the Green Fund replied to any of my requests. Project proposals or reporting written by Stellenbosch University and the donors could have given insight into these perspectives, however these were confidential and therefore neither available on their websites nor provided by the SI.

When conducting qualitative interviews, there is a risk of bias as the data is based on the personal memory of the interviewees, and does not reflect their concrete actions. However, the validity of the data has been ensured by interviewing different people regarding the same events and by reviewing the written data collected. Another critical consideration is that I as the researcher may have affected the interviewee's statements or influenced the situation. This is something I have been aware of and attempted to avoid by being open to where the interviewee directs the conversation (Kvale & Brinkmann 2009:320). The risk of bias also occurred as I personally became fascinated by how much time and efforts some of the stakeholders had spent in order for the iShack project to succeed, however by analysing the data with ANT as a theoretical tool and thus defining stakeholders based on their associations in a network of actors, I was assured my perceptions would not impact the descriptions of the different actors.

Chapter 4: Discourse analysis

In this chapter I will analyse the communication surrounding DDD and TDR by applying Laclau´s discourse theory. The analysis is based on the literature in Appendix 1 and 2. For the reason that Laclau does not provide a set definition for when a discourse is stabilised, it is up to me as the researcher to construct it through analytical observation. I feel confident that the amount of literature included in the bibliography is sufficient basis for this analysis, however I am also aware that the observation of the data could have led to different results if other data was collected or other theoretical contributions applied.

4.1 Analysis 1: Re-articulating the discourse of doing development

In the first section, I will describe the status quo of international development and analyse the discourse that emerges from a variety of documents articulating the practice of international development. In the second section, I will apply the concept of re-articulation to analyse how the DDD communications seek to give meaning to what it entails to do development. Further, I will apply the concepts of chain of equivalency, nodal point and antagonistic boarder, in order to analyse how the DDD community creates its identity as a social movement. I will conclude this chapter by answering the sub-questions of: "What does it entail to do development differently?".

4.1.1 The discourse of international development aid

In this section, I will provide the reader with a brief overview of the elements articulated in relation to international development today. This is in order to give an overview of the context in which DDD arrives at. My intention was to analyse the DDD communication as a dislocation in the status quo of development, however I found that there is no stabilised discourse in the development sector, rather a field of discoursivity.

4.1.1.1 Elements in the development discourse

One of the different elements I can observe as articulated in relation to international development practice, is the standard of aid. Traditionally, aid standards have been streamlined in agreements like the Paris Declaration on Aid Effectiveness[3], the Accra Agenda for Action[4] and the Busan Cooperation for Aid Effectiveness in 2011. In Busan the diversity of development cooperation actors was embraced (Michel 2013:11) and both new and traditional actors joined the cooperation, reflecting a common

[3] The Paris Declaration (2005) is an action-oriented roadmap to improve the quality of aid and its impact on development. It holds five fundamental principles for making aid more effective and to ensure that donors and recipients hold each other accountable for their commitments (OECD: n.d.).

[4] The Accra Agenda for Action (2008) proposes four areas for improvement to accelerate the advancement towards the Paris targets, including local ownership, inclusive partnerships, delivering results and capacity development (OECD 2012).

platform and principles for effective development work (NORAD 2015). The platform was built on previous meetings in Paris and Accra, but changed the emphasis from the effectiveness of aid to the cooperation for aid effectiveness, with the goal of including all actors in the development sector (Besada & Kindornay 2013:272). The Busan principles articulate the concepts of local ownership; focus on results, partnership, transparency and responsibility (The Busan Partnership for effective development cooperation, 2012).

Another element I observe as articulated in relation to international development, is that of good governance. In a report by James Michel, senior analyst at the Centre for Strategic and International Studies (CSIS), the current trends and issues in international development are addressed. He suggest that even though good governance was first introduced on the agenda in the 1980s and had its golden era in the 1990s, it is still important today (2013:2-4). In fact, an estimate by Organisation for Economic Co-operation and Development (OECD) suggests that around 9 percent of the ODA from its member countries (i.e. USD 12 billion) went to democracy and governance in 2013 (ibid).

One other element articulated in relation to international development is the changing modalities for aid delivery; building of local capacity (Tilley et.al 2015) often through technical assistance (Rosenkranz 2011) and; "measurable goals, evidence based decisions and impact evaluation" (Michel 2013:9). For example, DFID has clear definitions of how to evaluate evidence and measure impact.

International development is further articulated in relation to the positive results of development initiatives, for instance DFID and NORAD publish impressive results on their websites, and the UNs MDG report (2015) highlighted the positive outcomes of the goals such as lifting more than one billion people out of extreme poverty and helping more girls than ever to attend school[5]. While learning from and investing in "what works" has high priority in the development sector (Petruney 2014), the lack of willingness to talk about and learn from failure (ibid., Vowles 2013 & Saldinger 2014) illustrates a different characterization of the development discourse, where objectives and goals that are not achieved fade in the shadow of the more attractive opposite, success. In turn, this leads to business as usual and no pressing need for changing the procedures in international development.

4.1.1.2 A changing environment

Additionally, a shift can be observed in both those who engage in development work and what the focus is. Traditionally, aid has been divided between humanitarian aid and development aid, where humanitarian aid is designed to save lives, alleviate suffering and maintain and protect human dignity during and in the aftermath of man-made crises and natural disasters (Global Humanitarian Assistance),

[5] Not that there is anything wrong in focusing on the positive progress in the increasingly complex world. Learning from failure is important to address how we can become better at what we do, and initiatives like the Fail Fair is an initiative in the right direction towards acceptance.

whereas development aid often referred to what is known as official development assistance (ODA) – the transfer of public funds either through bilateral aid directly from one government to another, or multilateral through NGOs or other implementing organisations (Rosenkranz 2011).

However, in the last years there has been an increased focus on humanitarian aid to fragile and conflict affected states, security and migration, observed in the strategy and priority areas of both UK´s, Denmark´s and Norway´s development agencies (DFID 2016, Danida 2012 & Zahrisen 2016). It can further be observed as the worlds first humanitarian summit will be held in Turkey in May 2016, gathering leaders from around the world to discuss what can be done to solve the humanitarian crisis of today (Humanitarian Summit). The emphasis on humanitarian aid in turn leads to a decrease in development aid from traditional donors to, for instance, productive sectors in developing countries, like agriculture, industry and infrastructure (Agarwal 2013:50). In particular, Norway has been criticized for allocating money from the development aid budget to migration and security (Zachrisen 2016).

Further, there can be observed an emergence of a set of new actors in the field of development. ODA has traditionally come from the 29 member countries of the Development Co-operation Directorate (DCD-DAC). The UN target is that every member country shall use 0.7 % of its Gross Notional Income as ODA (ODA 2014). Other traditional institutions aiding to reduce poverty and improve governance are multilateral agencies such as the World Bank and the United Nations, consultancies like the Dalberg group, implementing agencies such as Save the Children, and advocacy groups such as Amnesty International. During the recent years, there can be observed an emergence of donors from China, Brazil and India, private donors such as the Bill and Melinda Gates Foundation, and corporate philanthropy like UBS's philanthropy department (Rosenkrants 2011). The diversity in development actors operating today can be observed as "challenging the standard of aid" (Rosenkrantz 2011) and the role of China is particularly discussed by the traditional donors, e.g. at a recent debate at the Norwegian Institute for International Politics (NUPI) [6] and a HBO documentary observing the challenges regarding Chinese investment banks (VICE episode 410). Besada and Kindornay (2013) suggest that Brazil, India and China seek their own narrow short-term interests in securing resources and markets for their own growth and also provide aid based on their own terms, not necessarily the principles from Busan 2011.

4.1.1.3 Can a discourse be observed?

It is my understanding that in order to analyse the DDD communication as a dislocation, the discourse that becomes dislocated first has to be analysed. The development discourse is characterised by a set of different elements like good governance, capacity development, transparency, accountability, local ownership and learning from what works. However, the discourse is also challenged by a set of

[6] NUPI, "The West- and the Rest in Multilateral Development Finance: New Actors, Changes and Challenges". 13th of April. Available from: https://www.youtube.com/watch?v=cME4JPMrr4Y

emerging donors like China and Brazil, a focus on the role of the private sector and a shift from development aid to humanitarian aid.

A discourse as defined by Laclau, is a structural totality of different elements of practice and utterances held together by a central element (Andersen 1999:89-95). A central element in the development discourse could be identified as the Sustainable Development Goals, which brings together different actors and practices in order to define how to achieve a set of goals. On the other hand, the potential geo-political motivations of actors like China and corporate businesses challenge this. I cannot identify a development discourse in the notion of a stabilised structure between different elements, as the shift in focus and new actors has already challenged what could have been a discourse at a given time in history. Dislocation describes the process when the temporarily defined structure in a discourse is disturbed or disconnected and opened up for re-articulation (Hanstveit 2014: 22). I therefore claim that the development discourse is already dislocated, i.e. it is disturbed and changing. The DDD community thus arrives in time to contribute to the re-articulation process of what development is and how it should be done. This will be analysed in the following section.

4.1.2 DDD as attempts of re-articulation

Based on the above analysis of the discoursivity in international development, I have presented the reader with insight into the context where DDD emerges as a community. In the following section I will analyse the DDD communications as attempts of re-articulating what it entails to do development today. According to Laclau, dislocation opens up for re-articulation, which is the process where different elements are chained together and their identity modifies and becomes something new (Hansen 2006:38). Re-articulation can therefore be understood as linking different elements together by the motivation of translating their meaning. From the literature, it can be observed that a range of actors seek to articulate the meaning of international development, and instead of giving a brief overview of the many actors, this section will provide an in-depth analysis of the DDD-communication.

4.1.2.1 Re-articulation of the development practice

The articulation by the DDD community links together different elements as the way forward for international development practices. The DDD principles themselves connect the concepts of (real) local ownership; the inclusion of local stakeholders to identify problems and solution; political, social and managerial legitimisation; the collaboration with local conveners; on-going learning cycles adapting from both successes and failures; risk management by making small bets; and the fostering of real results for real people (DDD Manifesto). These elements are different from each other (i.e. political legitimisation and risk management), yet equivalent as they all give meaning to what it means to "do development".

In addition, the DDD literature integrates concepts from other sectors. Booth (2014) introduces the concept of development entrepreneurship[7] as a way of doing development differently. Entrepreneurship can be defined as "the activity of setting up a business or businesses, taking on financial risks in the hope of profit" (Oxford Dictionary). When articulated in relation to international development work, entrepreneurship has a meaning of implementing development initiatives that are politically feasible and managing risk by making small bets. It is described as "clever interventions to navigate the rocks and shoals of the informal system" in the given country (Booth 2014: VIII) and consist of three key components; identification of reform options that are technically sound and politically feasible, also referred to as second-best reforms or good enough change; the way in which reforms are identified and introduced in an iterative and entrepreneurial process; and the identification of a team of local leaders who are motivated and take personal responsibility for improving the societies they live in [8](ibid.:5). The articulation of entrepreneurship as DDD, illustrates that concepts from the business sector can be used to describe practices also in the international development sector.

Another example of how different elements are re-articulated in relation to the way forward for international development is Tulloch's (2015) introduction of the concept of quality improvement (QI) borrowed from the health sector in relation to adaptive development and DDD. In the public health sector, quality improvement is defined as "a cyclical process of measuring a performance gap; understanding the causes of the gap; testing, planning and implementing interventions to close the gap; studying the effects of the interventions; and planning additional corrective actions in response" (Tawfik et.al 2010 in Tulloch 2015). One of the key messages in the study is that QI is problem-driven, iterative and flexible, and that adaptive programming in the health sector is relatively advanced, which in turn other areas of international development can learn from (Tulloch 2015). Adaptive management in development has also been connected to the concept of agile project management which originates from the Information Technology sector, yet is described in relation to development as a user-centred project design which forces the policy makers to test their assumptions with the end users throughout the project preparation lifecycle and continuously adapt to the feedback (Vein 2013). Both agile management and QI can be observed as articulated elements, connected to the chain of element seeking to give meaning to DDD.

[7] Faustino and colleagues first created the model in 2012.

[8] Persons who are capable, motivated and have the skills to manage others in the ways required by the development entrepreneurship model, may not be easy to find, but possible (Booth 2014: XIII). Also articulates a development worker as a development entrepreneur.

Further elements articulated in order to give meaning to DDD, are "an arm´s length approach[9]", brokering of relationships (Booth 2013; Williamson 2015), Problem-driven iterative adaptation (PDIA) [10](Andrews, Pritchett & Woolcock 2012; Andrews et.al 2015); and politically smart development [11] (Booth & Chambers 2014; Booth 2014; Booth & Unsworth 2014; Booth 2016; Wild et.al 2015).

Based on the above analysis of articulation, I identify how DDD links together a set of different elements when seeking to give meaning to what it implies to do development differently. DDD can therefore be observed as the nodal point, understood as the central element in the discourse which partly stabilises the communication and where the surrounding elements pursue to stabilise it´s meaning (Andersen 1999:94). However, what it entails to do DDD is also defined by the construction of an antagonistic opposite, analysed in the below section.

4.1.2.2 The antagonistic other

While articulating a set of elements seeking to stabilise the meaning of what it entails to do development, the DDD community also articulates a set of elements that they are different from, the elements which are excluded from the DDD discourse. Laclau suggest that what is excluded has to be reduced to pure negativity and a threat for the system of relational differences, in order to establish a boundary between the inside and outside of the discourse (Laclau 2002:138). The excluded other can be observed in elements like best practices, pre-defined solutions and donor-centric PEA. The excluded contributes to give meaning to DDD, in the sense that for doing development to be different, it has to be different from something.

For example, it is articulated that: "instead of standard prescriptions of how development should look like, the different way of doing development should recognize that ready-made solutions do not match the problems complexity and political economy" (Wild et.al 2015: 25). This suggests that DDD is not standard prescriptions nor pre-made solutions. This is supported by the following quote, "the DDD ideas hold an implicit rejection of the blueprint and best practise models for development so often conceived by international experts in recent years" (Tulloch 2015:2) and further explained by Wild et.al. (2015) whom suggest that the targets for institutional improvement under the SDGs fail to connect with relevant evidence in three ways:

[9] Booth (2013) introduced the concept of doing development at arm´s length, i.e. organisations that do development as facilitators of change rather than funders of development, which attract funding from donors but remain relatively self-regulated.

[10] The PDIA approach focuses on solving locally defined problems in performance; creating an environment for decision making which allows for positive deviance and experimentation; rapid feedback loops that ensure experiential learning; and engages a broad set of agents to ensure that reforms are viable, legitimate, relevant and supportable (Andrews et.al 2015).

[11] Politically smart means moving from doing donor-driven PEA-analysis to engaging with local reformers who have extensive knowledge of their political context (Wild.et.al 2015:27).

1) Their reliance on international models of best practice rather than models that are feasible in difficult political contexts

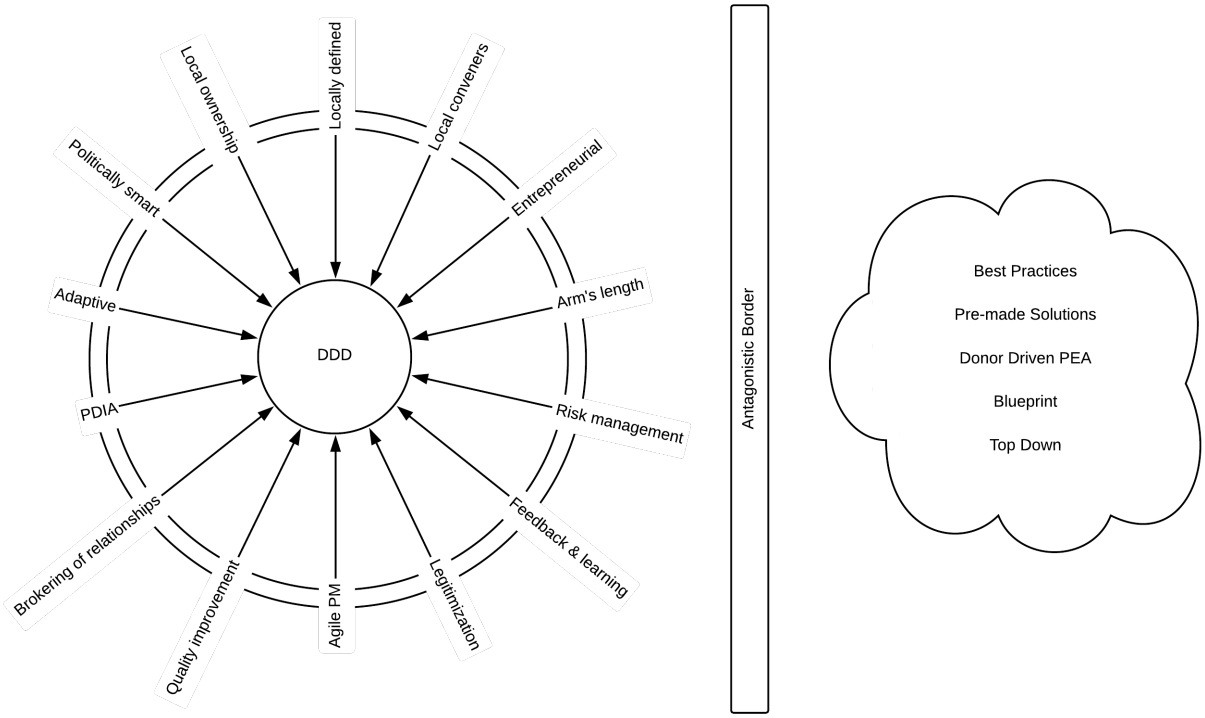
2) Their assumption that all good things go together, when it comes to governance, peaceful societies and development

3) Their neglect of the possibility that governments adopt recommended policies or institutions in a formal way only, leaving real problems unsolved (p.7).

The critique of ready-made models is shared by Williamson (2015); and a case study of seven different initiatives based on the DDD approach, claim that many of the constraints to implementation of the DDD principles practice would be very easy for donor agencies to actually do, if "they had put their mind to it" (Booth and Unsworth 2014: 24), implying that funding agencies have the capacity to DDD, but the action is missing.

It can be observed that DDD has constructed an antagonistic boarder between elements that DDD are different from and elements used to describe DDD, and only by doing so, DDD creates their own identity as a community representing the way forward. The antagonistic boarder creates a temporarily stability in the network of different DDD elements, and I therefore claim to have identified a discourse in Laclau's use of the word; a structural unit of differences (Andersen 1999: 99). The different elements inside the discourse are different from each other, while simultaneously being equal as they are different from what is situated on the other side of the antagonistic boarder. The elements can therefore be observed as constructing a chain of equivalency, understood as a common constitutive difference to the "other" (Andersen 2003:55). The boarder between the elements inside and outside the discourse are illustrated in the figure below.

Figure 1 The DDD discourse and the antagonistic other



4.1.3 What is the meaning of DDD?

We have seen that the communication surrounding the DDD community, chain together different elements by (re-)articulation of what it signifies to do development. Therefore I suggest that the name of "doing development different" function as a nodal point; as an element that partly stabilises the communication in the discourse (Andersen 1999:89). Within the DDD discourse, DDDis articulated in a way, which connects other elements like adaptive programming, entrepreneurship and locally defined problems.

The communication has also been observed as constructing a border to what the discourse *is not,* which is turn are bringing the different elements together because they are not describing the other side, which lies in the name of doing development "differently" itself. Laclau suggests that the element placed outside the discourse, has no effect of stabilization on the discourse. I claim to observe the opposite, as without the construction of the antagonistic boarder of what DDD does not signify, the DDD discourse would maybe not have had any existence in itself. Without the DDD communication articulating the exterior of the discourse, namely the blueprint approaches it is seeking to change, it is possible that the different DDD elements would never have been linked together in a chain of equivalency and the discourse would not have been constructed as such.

When the signification of what it signifies to DDD appears to be organized by the elements placed outside the discourse, this open up for the possibility that also other elements can be described as DDD as long as they cannot be used to describe "the other", and can be used to give meaning to the signification of DDD. It is based on this, I claim to observe TDR as an element that can be used to give meaning to DDD and not "the other". This is analysed in section 4.3, however in order to analyse a relation between TDR and DDD, I find the need to analyse what it entails to do TDR in the following section.

4.2 Analysis 2: Re-articulating knowledge production

In this section, I will apply the concept of articulation in order to analyse how different scholars give meaning to Transdisciplinary Research. When investigating TDR, I soon found that there exist a great variety of definitions of the concept, and in order to avoid the pitfall of defining it as "any interaction between scientists and practitioners, including consultancy, participatory research and even interviews" (Scholz and Steiner 2015:653) I found this analysis necessary in order to establish an understanding of TDR for this thesis.

Similarly to the analysis of DDD, I will start by analysing the context in which TDR is located. This will provide the reader a brief overview of how (some) knowledge production is changing in line with the complexity of the world and how TDR may come in as a new mode of knowledge production. Thereafter, I continue to analyse TDR as a floating signifier and identify the different perceptions of its signification and observe how the communication simultaneously constructs a border to what TDR does *not* signify. I will conclude by offering my understanding of TDR, which in turn will be analysed in Chapter five.

4.2.1 The past and the present of knowledge production

In order to analyse the signification of TDR, I found it necessary to analyse the context in which TDR is located as a signifier, namely the context of knowledge production. One of the elements that is articulated in relation to knowledge production is the changing nature of knowledge itself. Whereas the early universities started with four disciplines together creating the totality of knowledge, the disciplines of Medicine, Philosophy, Theology and Law (Max-Neef 2005:6), knowledge has specialized from these four disciplines into more than 8,000 academic disciplines existing today (Nicolescu 2014; 193). Knowledge today is articulated as the "understanding of or information about a subject that you get by experience or study, either known by one person or by people generally" and "the state of knowing about or being familiar with something" (Cambridge Dictionary). This articulation can be observed as implying that one does not have to be a professor of law to possess knowledge about law, as knowledge can also be a personal understanding or experience. In philosophy, knowledge is articulated based of three categories; personal knowledge which is based on acquaintance, for example to know a municipal councillor or a music genre; procedural knowledge regarding how to do something and the ability to it, such as how to drive a car or how to mobilise the community; and propositional knowledge about the facts i.e. what exists in the world (IEP n.d.). The Research and Policy in Development Programme at ODI articulates that much of the local knowledge, which often is acquired through word of mouth, reading or personal experience, also is extremely relevant and valid for policy and practice.

In addition to knowledge no longer being articulated as only as academic knowledge, I observe a change in the articulation of who the knowledge producers are. The production of knowledge is no longer observed as reserved to independent research institutions such as universities, but is produced by a number of actors, for instance corporate businesses and government institutions which may have both political and economic agendas (Andersen 1999:10-11) as well as knowledge intermediaries like think thanks and NGOs which may also have their own agendas or be driven by the motivations of their funding parties.

Further, knowledge production is articulated in relation to the legitimacy of the knowledge. With many different actors involved and many forms of knowledge, it can be observed that what is observed as legitimate knowledge usable as evidence [12]will vary from the different actors producing or using it. However, the legitimacy of knowledge is often articulated in relation to the way in which knowledge is produced, i.e. the methodology of research, or the "systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions" (Oxford Dictionary). For example, DFID (2014) validates the evidence they use based of the type of research, i.e primary, secondary, theoretical or conceptual studies; the research design; and research method to collect and analyse the data (2014:5-8). The validation of traditional knowledge from local and indigenous people can be observed as more challenging, for instance Widdowson and Howard (2008) articulate that traditional knowledge from indigenous people requires scientific testing before it can be accepted as knowledge, but will never be compatible with scientific knowledge (in Matsui 2015:3) whereas Swazo (2005:569) criticizes that indigenous knowledge is way too often evaluated according to prevailing Western standards of epistemology, logic, scientific method, ethical theory.

It can be observed that TDR arrives in a context where even the meaning of knowledge, who produces the knowledge, and how the knowledge is perceived as valid, is flux. This can therefore be observed as discoursivity, understood as a relation between different elements in which the elements are given their identity, but which is not fixed. When knowledge is given its identity in relation to research, but can also derive its identity by personal networks, the relations are floating. TDR arrives as a style of knowledge production that combines academic, personal, procedural and propositional knowledge, not only from academic researchers but from a variety of stakeholders with an interest in the object of research. Transdisciplinarity originates from *trans* meaning *across or beyond* (Oxford Dictionary) and *discipline*,

[12] RAPID defines evidence as based of the Oxford English Dictionary; "the available body of facts or information indicating whether a belief or proposition is true or valid", adding that much of the evidence used in policy-making is implicit in the knowledge of the stakeholders involved (X).

which arrives from the Latin word *discipulus* meaning pupil and *disciplina*, meaning teaching. As a verb, discipline means both training someone, and also punishing and enforcing obedience (Krishnan 2009: 8). By integrating the two definitions, the word transdisciplinarity itself can be observed as signifying "a systematic investigation into a subject of matter that goes across and beyond disciplines". However, this definition does not provide sufficient clarity of what TDR entails. In the following sections I will thus proceed to observe how some of the TDR scholars subscribe meaning to TDR, while simultaneously constructing a border to what TDR is *not.*

4.2.2 TDR as a floating signifier

When researching TDR in the initial phase, I found that it has a great variety of meanings depending on the articulation of it. One of the TD advocates admit that he, as many other TD scholars; try to impose his definition as the right one to the others and further acknowledge the irony of it: "*the contested meaning of transdisciplinarity is relatively ironic for a community of scholars who sees the openness to other viewpoints as the fundamental prerequisite for doing transdisciplinarity*" (Pohl 2010:74). It can thus be observed that there exists a struggle to stabilise the meaning of TDR between the different scholars, despite the emphasis on being open for other perspectives. In the following section I will observe some of the articulations of TDR as attempts of stabilising the meaning, however I am aware that if other articulations had been observed, the meaning could have been different.

One of the elements observed as articulated in relation to TDR, is participatory research. Participation (i.e. inclusion of non-academic actors) was articulated in relation to TDR under the introduction of Mode 2 of knowledge production (Nowotny 2004), whereby knowledge is produced in the context of application, involving a broad range of perspectives, being more socially accountable and flexible (Gibbons 2000:159-160). It is can be observed as a shift from observing *on*, to observing *with*, in the sense that the participants are included in the observations and participate in the knowledge production, rather than being studied as objects (Bernstein 2015). Further, TDR as participatory research is articulated as incorporation of procedure, methodologies, knowledge and goals from science, industry and politics (Scholz et.al. 2006:231-232). The articulation of TDR as participatory research, can therefore simultaneously be observed as an articulation of what TDR is *not,* i.e. Mode 1 of knowledge production, where specific problems are solved within the specific research community conducted by researchers (Gibbons 2000:159-160).

A second element that can be observed as articulated in relation to TDR is the focus on socially relevant issues and complexity problem. German philosopher Misselstrass called for collaboration between disciplinary boundaries in relation to problems in the everyday world (Pohl 2008: 47). The problem focus is also supported by Scholz et.al. (2006:233), who suggests that TD initiates the knowledge

production from relevant, complex societal problems, and is often applied in relation to "ill-defined problems" with high degree of uncertainty, where only the initial state is known (e.g. that there is a need for alternative upgrading of informal settlements) and the desired outcome and the way to reach the goal, are unknown.

A third element observed as articulated in relation to TDR, is the unifying of knowledge and thought-styles. The unity of knowledge beyond all disciplines to structure, analyse and process socially relevant issues was first articulated by Nicolescu (Pohl 2010:77) and is based on three fundamental pillars; levels of reality; the principle of the included middle and complexity (Nicolescu 2014:X). Pohl (2011:621) later articulated the unity of knowledge in TDR, in relation to integrating different thought-styles. A thought-style is articulated as "(...) *a specific way of looking at the world and distinguishing relevant and irrelevant aspects"* (ibid.). A disciplinary thought-style is articulated as the state of knowledge, methods, theories, quality criteria and research questions, where individuals are trained or disciplined in a specific way of looking at and structuring the world (ibid.). A TDR process on the other hand, is articulated as integration and transformation of both disciplinary thought styles and thought styles from further sectors of society[13] (Pohl 2011: 622). Additionally, this can be observed as an articulation of what TDR is *not,* such as knowledge production only including one or a few disciplinary thought-styles or levels of realities.

A fourth element that can be observed as articulated in relation to TDR is disciplinary re-organisation, or the transcendence from disciplinarity, to pluridisciplinarity, to multidisciplinarity, to interdisciplinarity to transdisciplinarity (in amongst other: Lang et.al.2010: 26; Pohl 2011:619; Hall et.al. 2008:165; Max-Neef 2004:6-9). It can be observed that TDR is articulated as a form of knowledge production with a high level of coordination between the different disciplines, which is different from all the other disciplinary approaches because it involves coordination from a higher-level concept, e.g. innovation or sustainable development. Furthermore, this can be observed as articulating a boundary between TDR and all other disciplinary approaches.

Additionally, TDR can be observed as articulated in relation to "research collaboration" i.e. working together towards a common goal of producing new knowledge (Harris & Lyon 2013:110); "interactive knowledge production and boundary organisations" (Pohl et.al. 2010:268); and "mutual learning between science and society" (Scholz & Steiner 2015:654).

[13] It is worthwhile to mention, that Pohl emphasises that every participant in a TDR process is a member of several thought-styles and may well be members of the same, similar or conflicting thought-styles. Often participants are blind to how their thought-style influences their work, and they are strongly convinced that their framing of the problem and the solution is self-evident and that the others will agree after careful consideration (Pohl 2011:622).

Furthermore, it can be observed that while the signification of TDR is not defined in a fixed structure, the same occurs when observing articulations of how to apply TDR in practice. I observed articulations of the impossibility of having a single TDR methodology (Wickson et.al. 2006), the challenges of practicing TDR in a systematic manner (Max-Neef 2005:15) and the emphasis on following what emerges (Bernstein 2015:32). Others have created a toolbox, articulating specific methods of conducting TDR, such as actor constellation" – a role-play to jointly sorting out the relevance of various involved actors for tackling a specific research question; or "three types of knowledge tool[14]" – to tailor research questions to societal knowledge demands (td-net toolbox). Hall et.al. (2012) goes further and articulates a four phased model of TDR, consisting of; the *development* of a research group; *conceptualization* of the research question and the research design; *implementation* of the research; and *translation* of the findings into new research or solution-oriented strategies. Of the scholars who articulate a TDR methodology, several (e.g. Michel et.al 2013) refer to an ideal-typical process articulated by Lang et.al. 2012. This model can be observed as similar to Hall et.al.´s, but different as it goes into more detail. The ideal-typical process is articulated as three phases; 1) team building and problem framing; 2) co-production of solution oriented knowledge; and 3) implementation of the knowledge produced. Whereas these models can be observed as focusing on a team approach to TD, others articulate that the team can also consist of a solo TD researcher, as long as the researcher is able to fuse knowledge from a number of different disciplines and engage with stakeholders in the process of generating knowledge (Wickson, Carew & Russell 2006:1052 in Bernstein 2015).

4.2.3 From floating signifier to a discourse?

Based on the above analysis, it can be observed that the signification of TDR, both the concept and its application, is fluctuating. TDR has been observed as signifying a philosophical approach to unifying knowledge beyond all disciplines (such as Nicolescu) or a practical research methodology to create solutions to complex problems (e.g. Lang et.al.). I understand a floating signifier as a signifier with no stabilised meaning, in other words when the relationship between the signifier and the signified is not fixed. By observing and illustrating the contested meanings of TDR, I have attempted to analyse TDR as a floating signifier.

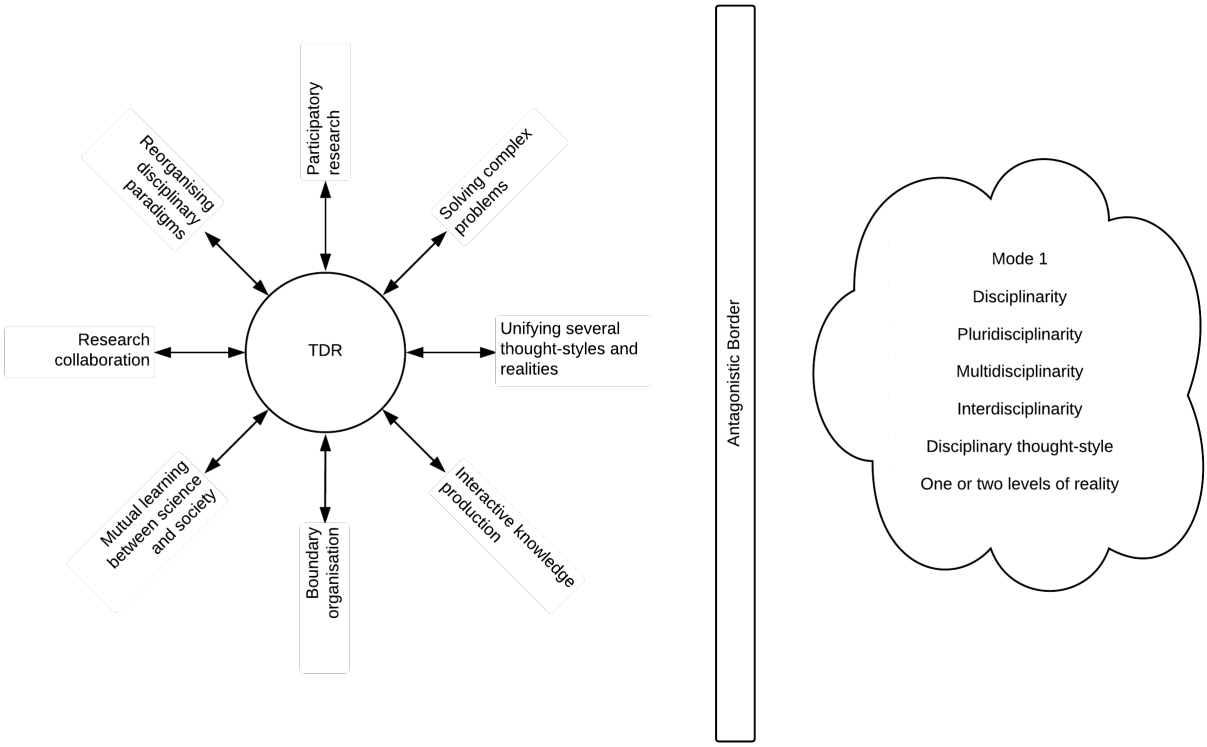
Nevertheless, I claim to observe a similarity between TDR as a floating signifier connected to different significations, and DDD as a nodal point connecting different elements in pursue of giving DDD its meaning in section 4.1. This is based on the observation of constructions of antagonistic borders. Whereas I observed how the DDD communication constructed a boarder to what it´s not (i.e. pre-

[14] The three types of knowledge are systems knowledge (about what is); target knowledge (about what should be); and transformation knowledge (how we come from where we are to where we should be) (TD-net toolbox).

defined solutions and best-practices), I claim that the different significations of TDR can be observed as constructing a border to what they are not (such as all other disciplinary approaches and mode 1 of knowledge production), and that the excluded elements thus contribute to attribute meaning to the elements that can be signified by TDR. I therefore propose that TDR, while being a floating signifier, simultaneously can be observed as stabilised signifier, by only signifying elements that are not located on the "other side" of the antagonistic border.

As it is up to the researcher to identify a discourse, i.e. "a structural unit of differences" (Andersen 1999: 99) I claim to observe a structure between the elements that are articulated as TDR for two main reasons. First, the elements are related together inside the discourse by signifying something different than what is on the other side, such as traditional knowledge production or following strict disciplinary paradigms. Second, the elements are different from each other inside the discourse, i.e. participatory research and unifying knowledge. Therefore, I propose, quite radically, that TDR can continue being observed as a floating signifier used to described all forms of knowledge production which are not equivalent to the "other side", simultaneously as being observed as a nodal point stabilising the relation between all elements that cannot be used to give meaning to the "other side".

The observation of a discourse support the variety of articulations concerning the possibility of a TDR methodology, in the sense the antagonistic border constructs doing TDR as a process different from doing disciplinary, multidisciplinary, pluridisciplinarity and interdisciplinary research and which integrates more than one level of reality or thought style. The discourse is illustrated in the below figure.



4.2.4 My understanding of TDR

Building on the findings from the analysis above, my understanding of TDR is a way of producing knowledge which goes beyond disciplinary research, in the sense that it includes collaboration between academic researchers and other stakeholders such as local communities, policy makers or businesses. Further, it is focused around solving an actual problem in its context, and therefore the inclusion of the affected stakeholders is important in order to establish a profound understanding of the problem and its causes, and to be able to produce a feasible solution.

When it comes to application in the real world, I lean on the ideal-typical model of Lang et.al. (2010). This is because I understand TDR as a process of not only identifying a problem and co-producing a solution with the affected stakeholders and researchers, but that also the implementation is part of the process. When continuing implementation based on a TDR approach, the solution is open for co-produced adaptation and reformulating, and also has the possibility to draw on e.g. personal knowledge for implementation. However, I acknowledge the problem of constructing a rigid approach which is useful in any context, and thus emphasise the need for flexibility and adaption.

4.3 Can TDR be part of the DDD chain of equivalence?

Based on the above analyses, I will in this section analyse how TDR could be articulated as an element inside the DDD discourse. This is a first order observation of the hypothetical relationship between DDD and TDR, meaning that it is an articulation based on my observation as the researcher, founded in the findings from the analysis above.

First, TDR builds on identifying problems in teams of stakeholders who are affected by the issue at hand (Lang et.al. 2010). This is similar to the DDD principle of locally defined problems and the PDIA approach, while being different from the "antagonistic other" who start from predefined solutions rather than solving an actual issue. Secondly, TDR builds on a co-production of solution-oriented knowledge where all different inputs are valued (ibid.). This is similar to the DDD principle of collaborating with local conveners in both designing and evaluating the interventions, while being different from "the other", which is not based on co-production but copies of best practises and implementation of already-made interventions. Third, TDR emphasises an application and re-application of the solutions produced where one adapts to context and feedback (ibid.) which is similar to an adaptive, iterative cycle of planning, action, reflection and revision drawing on local knowledge, feedback and energy in the DDD discourse and different from the predefined solutions unable to adapt in "the other". The similarities between TD and DDD, and their difference to the antagonistic others, are illustrated in the table below.

Table 1: The relation between DDD and TDR

TD	DDD	The others
Team of academic and non-academic stakeholders with an interest in the problem	Locally defined problems PDIA	Predefined solutions Observation of research objects Little or no coordination between disciplines
Co-production of solution-oriented knowledge, respect for different values and thought systems	Collaboration with local conveners, doing what is politically feasible and adapt to context Second-best options, entrepreneurial approach	Solutions are already made or copies of best practises. Depending on rigid methodologies in order to produce valid knowledge
Application and reapplication of solutions, while adapting to context and feedback	Adaptive programming, learning from what works, making small bets, iterative cycles of planning and revision.	Implementing best practices with rigid measures for results. Research contributes in the given research discipline (s).

As a research process to produce solution-oriented knowledge, TDR is different from the other elements connected in the DDD-discourse, yet at the same time similar because, as we have seen, TDR is different from what the DDD communication characterise as "the other". I therefore suggest that TDR can be observed as an element in the chain of different elements seeking to give meaning to what it signifies to "DDD" and which are different from the antagonistic other.

When the DDD community opens up for a debate on how to do development differently, I suggest that transdisciplinarity research can be a methodology to do so. Whereas one of the constraints to putting the DDD principles into practice is said to be the practitioner's lack of understanding of what DDD implies for their daily work (Wild et.al 2015), TDR offers a set of ambitions to follow and a three-step model for implementation. The next chapter will analyse the process of TDR in specific cases in the international development sector and seek to strengthen this proposal.

Chapter 5

Analysis 3: From problem to intervention through TDR. A case study of iShack

In the above analysis we saw that by observing DDD as the nodal point in a chain of different elements, linked together in equivalency, we open up for a connection between TDR and DDD in the way that TDR can function as an approach for how to apply DDD in practice. Drawing on these findings, I will proceed to analyse what happens when the ambitions underlining TDR are applied in practice in the case of iShack. In the below section I present the empirical background for the case study.

5.1 Enkanini – an informal settlement

In 2006, people began moving from Kayamandi[37], a predominantly black African residential area of Stellenbosch, onto the municipal conservation land, later called Enkanini[38]. The people moved to Enkanini to avoid paying the high rent in Kayamandiand others followed from different areas in search of the urban benefits – job opportunities, better health care, transport systems and the facilities in a city (Wessels 2015). Enkanini is located 1.8 kilometres from Stellenbosch central business district and close to a predominantly white middle and upper class neighbourhood (Wessels, 2015). In 2012 the settlement had close to 3,000 shacks and a population of to 4500 people. In conversation with Johru Robyn, the Manager of Informal Settlements in Stellenbosch Municipality, the number has increased in 2016 to 3,300 shacks and around 6000 people (Robyn 2016).

5.1.1 South African housing policy

With the elections in 1994, the South African government committed itself to developing more liveable, equitable and sustainable cities for its people. The Reconstruction and Development Programme (RDP) was introduced in 1994 as a socio-economic policy to end apartheid, rebuild the economy, meet basic needs, develop human resources, and democratise the state and society (DoH 2004).

Since 1994, the government has built over three million houses. Yet, with an estimate of over 7 million South Africans living in informal settlements, the demand is higher than the supply. On average the wait for basic infrastructure and housing is nine years, and those on the bottom of the housing list may have to wait up to 32 years for housing (Wessels 2015). Stellenbosch municipality estimates that it could take up to 100 years to house the informal population at current rates based on subsidized house construction (ibid.). Some of the requirements for getting on the waiting list for housing are

[37] Kayamandi is the neighbouring informal settlement to Enkanini.
[38] Enkanini means ”taken by force” X source

unemployment, income less than 3000 rand per month and no previous house ownership. These requirements have changed minimally since their inception (Robyn, 2016). According to Johru Robyn there are 13 informal settlements in the municipality of Stellenbosch today, whereas Enkanini is one of the three larger ones (ibid.).

5.1.2 Filling the waiting gap with in situ upgrading

In 2012 there was one toilet per 72 people, one water tap per 139 people, and frequent problems related to flooding and security (Wessels 2015). The basic services where not sufficient to support the growing number of residents in Enkanini (Radmore 2015: 11). After realizing that it could take up to 100 years to provide housing for the informal population at current rates, the municipality introduced the in situ upgrading plan with the goal of upgrading the current access to basic services. The target for Stellenbosch was to have 1 toilet per 5 household and 1 water tap per 25 household by 2014. The municipality emphasises that the continuous population growth in Enkanini as one of the reasons why these targets have still not been met by 2016 (Robyn, 2016). Additional factors such as frequent fires, indoor air pollution, lack of electricity, and high level of theft have led to clashes between the residents of Enkanini and Stellenbosch Municipality. The residents demanded that the settlement is supplied with electricity while the municipality contends that it is an illegal settlement located on land zoned for conservation. Another hindering factor is no formal leadership structure in the settlement that can engage with government or NGOs (Wessels, 2015: 82).

5.1.3 The interventions

In 2011, the National Research Foundation (NRF) started a funding relationship with the TsamaHub which in partnership with the Sustainability Institute established a TD group of academics and students, named the Informal Settlement Upgrading Group (ISUG) (Radmore, 2015:4). The original research was towards answering *what in situ upgrading, as specified by the Upgrading of Informal Settlements Programme (UISP), mean in practise for the average shack dweller in South Africa* (Swilling et.al 2013:1). They found that for many the mentality was to trust the government and wait for the formal housing upgrading, despite the long waiting gap (Wessels 2015). The research group started asking what practical things can be done while waiting and initiated co-produced initiatives concerning energy poverty, sanitation and waste management (Radmore 2015:4). This thesis will analyse the iShack initiative which focussed on energy and housing.

iShack stands for “improved shack”. The shacks where improved in various ways: they where fitted with solar home systems, which includes solar panels, distribution boxes and batteries, and offers a clean source of energy for lighting, cell-phone charging, TV and at additional cost, a fridge. Thanks to a specific design and orientation, it provides protection from extreme temperatures and collects rainwater from

the roof. It's built from materials that are affordable, accessible and impact the thermal comfort (e.g. cardboard boxes, bricks and mud).

The academic concept design was built and tested in October 2011, and in June 2012 the Bill and Melinda Gates Foundation contributed R 2.1 million to fund a pilot study to explore sustainable ways of delivering such a concept to residents in the community. Early on it was decided to focus on the delivery of solar energy services. During the pilot phase the South African Green Fund contributed an additional R 17 million for a scale-up to 1500 solar home systems in Enkanini (Swilling et.al 2013:1). To date, over 1000 households have received the service in Enkanini. There are on-going discussions about replicating the service elsewhere in South Africa (Conway 2016).

5.2 Layout of the analysis

Drawing on the knowledge gained in the analysis of TDR as a concept, I will analyse how TDR is applied in the real world. By using the iShack project as a case study, I am able to analyse how a project defined as TDR fit into the theoretical characteristics. By applying the Actor Network theory, I have the theoretical tool to analyse the dynamic associations between actants involved in the iShack project and the translation from a TDR project to a social enterprise with the potential to travel the world.

The story is complex and has many layers. It is rather impossible to capture all the action that has occurred from the research project which initiated in 2011, to the social enterprise that it is today. In order to analyse the TDR part of the project with ANT as a theoretical framework, I decided to start by presenting the knowledge that was produced by the research group. I will then continue to analyse which actants were part of the production of knowledge and how each actant contributed.

In the second section, I will proceed to analyse how the evidence functioned as a black box and thus enrol a set of new actants into the network, working towards the common goal of scaling up the implementation. I will follow the different negotiations that occurred, and also apply the concept of pre-scription in technology in order to analyse how some users are excluded from using the solar system.

5.2.1 Recalling the moments of translation

As I will be applying the moments of translation throughout the analysis, I find the need to recall their understanding in this thesis. Problematisation is the moment of translation when actants define a problem in a way so other actants becomes part of the network or the problem (Ratner 2013:48). Interessement is understood as the phase when actants seek to get other actants interested in collaboration, often by using an interessement device, such as a publication or a speech. Enrolment is the moment when the identity of actors are stabilised by their actions. Negotiations and power struggles may occur during interessement and enrolment. Mobilisation is understood as the moment

when the network is stabilised and one actant becomes the representative, or the spokesperson, for the whole network (Ratner 2013: 48-49 & Callon 1986:5-15).

5.3 The evidence produced

Early in October 2011, the first iShack was set up in Enkanini. Seven weeks later, the potential of the intervention was evident: compared to the retrofit and the control shack, the iShack demonstrated reduced indoor temperature fluctuation, increased buffer effect to shield against outdoor temperature stimuli, and increases in the Lag Effect between Indoor and Outdoor temperature swings. (Keller 2012:120). The participants living in the shacks during the test period also revealed socio-economic benefits, in the sense of improved economic standing through guaranteed mobile connectivity[39]; improved health through reduced use of traditional fuel and improved indoor temperature; positive impact on the education of child learners through the opportunity to study after dark; improved social network; improved feeling of safety due to outdoor security at night; and inspiration to further invest in their dwellings (ibid.).

The potential of the intervention had been proved in practice. By doing a few enhancements on the building material of the shacks, installing windows and a solar system, the residents of Enkanini had the potential to improve their living conditions while waiting for the government to act on their promises.

In the following section I will analyse how the TDR researcher functioned as an inscription device, here understood as not only a tool to transform material objects into statistical data, but also to transform and integrate different kinds of knowledge, in particular the experienced knowledge from the residents of Enkanini from oral to written form. By following the research evidence, I am able to analyse the associations between different actants stabilised in a network as a scientific fact.

5.3.1 The formation of the transdisciplinary research project

As we saw in chapter 4, the first step in an ideal typical TDR process is to gather a team and define a problem. In order for the TDR project in Enkanini to take place and the evidence be produced, there are several actants [40]that are key to describe; the research group, the failure of the Breaking New Ground Policy, the National Research Foundation, Stellenbosch University, Enkanini as the place of research, and Madiba Galada as a local key change agent.

[39] Plaatje, reported that before she got the solar system installed, she had to visit a friend in Zone O to charge her cell phone. As this took four hours and she has small children, she could not charge as often as needed, leaving her phone flat for days. This caused her loosing work as she was out of reach, or people would stop calling when she did not answer (Keller 2012:121). She now has the possibility to charge when necessary and can be available all the time.

[40] Actants are here understood as human and non-human actors who either are given their identity through the network, or change the identity of the network by enrolling.

5.3.1.1 Formation of the research group:

ISUG was initiated in 2011 by a group of student[41]s at Stellenbosch University. Their disciplinary backgrounds were in economy, social science, policy, finance, marketing, and anthropology (Keller 2015:2). With a focus on informal settlement upgrading and community engagement through TDR, the group adopted a research strategy that would introduce problem-solving strategies (Wessels 2015). The researchers enrolled as TD researchers not only because of the interessement device of gaining academic credits and practical experience, but also based on their personal motivation in order to contribute something (van der Heyde 2016).

5.3.1.2 Breaking new ground

Already before the project idea was articulated, there was the process of group formation between the national and local governments of South Africa through the policy BNG introduced in 2004. BNG was introduced to address many of the shortcomings of the original housing policy. It delegated responsibility of creating sustainable human settlements and in situ upgrading of informal settlements to the local governments (DoH 2004). This led to the formation of the Upgrading of Informal Settlements Programme (UISP) and the National Upgrading Support Programme (NUSP) (Keller 2012:1). BNG thus formed a network between the government, the municipalities, UISP, and NUSP, represented by the municipalities as the spokespersons for the collective, in the sense that they where the ones responsible for interpretation of BNG and its implementation. However, in situ upgrading under the BNG had not yet been realised in 2010, with the main reason being that there were no clear examples of how this could be done in practice (Keller 2012:14). It could be that an important actor was missing in the network – the inclusion of informal settlements.

5.3.1.3 The National Research Foundation and TsamaHub/SI

In 2010, the National Research Foundation (NRF) [42]put a call for proposals for research on community engagement (van der Heyde 2015:1) with the motivation of strengthening the knowledge on community engagement in South Africa. The NRF enrolled by awarding the TsamaHub with a research grant of R2.6 million in 2011 (Swilling et.al.2013). If the NRF had been enrolled a competing project proposal, it is likely this particular project would not have been initiated at the time.

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[41] ISUG was initiated by Lauren Taverner-Smith, a Phd student and economist focusing on water and sanitation; Joel Bronkowski, a Mphil student and social scientist focusing on community mobilisation and enumeration strategies; Mweendo Hamukoma, a BPhil student with a policy background investigating community perceptions to urbanisation and informality; and Andreas Keller, an Mphil student with a finance background assessing the viability of improved dwelling constructions and energy infrastructure systems (Keller 2015: 2). In 2012, the ISUG was joined by Vanessa von der Heyde, a Mphil student with a marketing background focusing on waste management in Enkanini; and Berry Wessels, a social anthropologist, analysing turning points in the process from research to social enterprise (ibid).

[42] The mandate of the NRF is "to promote and support research in order to facilitate creation of knowledge, innovation and development in all fields of science and technology, including indigenous knowledge, and thereby contribute to the improvement of the quality of life of all the people of the Republic" (NRF About, n.d.)

With the NRF call for proposals, TsamaHUB[43] and the Sustainability Institute (SI) recognized an opportunity to establish a research group focusing on incremental informal settlement upgrading based on TDR (van der Heyde 2015:1). This would be the first TDR case study in South African context (van Breda 2016). The TsamaHub and SI are important to describe as they where the ones writing the proposal for a TDR project and guiding the students in the research group.

5.3.1.4 Enrolling Enkanini as the space of research

For the ISUG to answer the research question they needed to engage with shack dwellers in an informal settlement. The settlement of Enkanini was identified as a potential space of research, for the main reason that a group of students at the SU had already built relationship with the community through an NGO established in 2010 [44](PM local NGO, 2016). For Enkanini to enrol as the space of research, the settlement needed to have the status as informal with the need for upgrading. This action (or non-action) could be challenged by other groups initiating similar projects in the area, or if the residents or the municipality initiated informal upgrading processes. However, in 2011 Enkanini was still an informal settlement with lack of basic services, with no other active institutions or organisations working there at the time, and Enkanini therefore enrolled in the network.

In order to meet the requirements for TDR, it was not enough that the ISUG was a team of researchers from different academic disciplines with access to Enkanini, they also had to identify non-academic stakeholders to collaborate with in order to research *with* shack dwellers, not *on* them. With lack of formalised leadership in Enkanini, ISUG put substantial efforts into building relationships and trust with the residents (Swilling et.al.2013). They stayed weekends over, painted shacks with colourful fire-resistant paint and initiated informal discussions with residents. One of the students even built a shack in the settlement and lived there with his wife for a year. Of particular importance, is the enrollment of Madiba Galada, a community elder (Wessels 2015:75). Galada contributed by identifying a group of residents interested in the project which became the co-researchers; allowed for frequent meetings in his private shack; and was crucial in securing the space for the research centre to be constructed. One of the researchers recalls: "*We where quite lucky, our first contact person in the settlement was Madiba Galada, which had quite a strong position there. So it was because of him we where able to gain entry to the community"* (Wessels 2016). It can thus be observed that personal and procedural knowledge were attributed an important role in this phase, by enrolling Madiba Galada and further by enrolling co-

[43] In 2010, Stellenbosch University initiated the HOPE Project with the aim of creating sustainable solutions through teaching, learning, research and community interaction. Under the HOPE banner, the TsamaHUB (Transdisciplinary Sustainability Analysis, Modeling and Assessment Hub) was established to promote TD studies in order to deal with the problems that are too complex for single disciplines to solve (Keller 2012:14). Now called: Stellenbosch centre for Complex Systems in Transition (CTS).

[44] The NGO, called Serve the City, was established by a group of students at the Stellenbosch University in order to initiate communications between the settlement and its surrounding communities (PM local NGO, 2016).

researchers based on his knowledge. TD scholar Van Breda at the TsamaHub emphasised that relying on this kind of informal relationship was what emerged throughout the process, and that he did not see other ways of doing it (van Breda 2016).

5.3.2 From waiting gap to alternative upgrading

In the above sections I have illustrated the different actants that were enrolled in the TDR team. The failure of the BNG can be observed as creating a demand for more research on in situ upgrading; the NRF awarded the TsamaHub and SI with a research grant to conduct the first TDR case study in South Africa, which in turn enabled the formation of ISUG. By applying TDR as their method, ISUG was obliged to establish relationships with non-academic stakeholders, in which a community elder played an important role in identifying community members, but also the time spent in Enkanini by the researchers building relationships and trust. The different actants and their actions are illustrated in the table below.

Table 2: Actants involved in the initial phase of TDR in Enkanini

Actants	Their action
South African local governments	Fail to implement in situ upgrading under BNG
The National Research Foundation	Call for research on community engagement in 2010. Enrol by funding the project in 2011.
The TsamaHub / Sustainability Institute	Write the research proposal, with a TDR approach and the question "What does in situ upgrading mean for the average shack dweller in South Africa?" Managing the relation with the NRF/students
ISUG	Form as a group of TD researchers. Build relationships and trust with the community in Enkanini.
Enkanini	Enroll as the research space, by lacking in situ upgrading
Madiba Galada	Build a relationship with ISUG. Contributes with personal and procedural knowledge. Identifies other residents interested in the project.
4 residents of Enkanini	Enroll as co-researchers, interested in change.

When a group was formed and relationships built, the problem was reformulated from *what does in situ upgrading mean for the average shack dweller* – to *what can be done while waiting?* This was built on the finding that in situ upgrading mostly means trusting and waiting for the government to deliver (Swilling et.al.2013). Together with the co-researchers, the research group initiated the process of

exploring alternative ways for in situ upgrading and three main areas in need of improvement were identified; waste, sanitation and energy. Which in turn can be observed as an exclusion of other needs such as alternative sites for flood-prone citizens as identified in the enumeration report (CORC et.al.2012: 18). As a TDR approach focuses on joint problem framing, these were the areas that emerged.

5.3.3 Co-production around alternative energy provision

In the following sections I will apply the concept of translation to analyse how a set of different actant enrolled in order to find alternative ways for in situ upgrading. I will only focus on the problem of access to electricity, which the group had identified as one of the main problems of Enkanini[45]. Co-production of solution-oriented knowledge is step two in Lang et.al.s model and it's suggested to conduct joint data collection and interpretation in the team (Michel et.al. 2013:12-14). In Enkanini, it can be observed that the researcher was the one collecting the data and communicating it to the different stakeholders involved in the team.

5.3.3.1 Enrolling actants from problem to solution

One of the researchers in the TDR group decided to focus on alternative ways of energy provision and improved dwelling design, and proceeded to inscribe different forms of knowledge relevant to the problem. Academic knowledge was inscribed through processes of literature review and discussions with professors; expert knowledge was inscribed through discussions and interviews with electricity engineers, NGOs, and energy providers; and experienced, context specific knowledge inscribed through interviews and household visits with a selection of residents in Enkanini (Keller 2012:14-19). The researcher can be observed as an intermediary between the different actors, also expressed by the researcher himself: "*There are different models for collaboration and knowledge integration, and the one I used was the one where the researcher was the central node between all the different stakeholders, simply because all the practicalities (…) to get everyone to gather and have the time (…)"* (Keller 2016). By observing the researcher as an intermediary, the researcher is given the agency to include and coordinate the different types of knowledge, however the different actants also have agency by sharing their knowledge, in the sense that they could have said no to interviews, household visits or other forms of knowledge sharing.

[45] This was mainly because, due to the lack of access to electricity through the grid, many of the residents illegally connect to the grids of their neighbours (e.g. a school) causing tension with the community outside the settlement, or use paraffin which is highly flammable and causes indoor air pollution. The use of paraffin and candles lead to frequent fires in Enkanini, in example in 2013 when 600 household where burned to the ground and people died (X source).

The different forms of knowledge were inscribed into two dwelling interventions with ecological fitting and a DC solar system[46], with the potential to improve shack dwellers thermal performance [47]and thermal comfort performance[48]. However, for the research to be able to verify the potential of the model, the interventions had to be tested. An obligatory point of passage can thus be observed as constructed: the shacks had to be constructed and the measures had to reveal improvements, in order for the models to function as a way to alleviate energy poverty through in situ incremental upgrading.

5.3.3.2 Enrolling participants through contracts; community approval through councillors and temperature through measuring equipment

The construction of the shacks led to the enrolment of more actants in the network of knowledge. First, the shacks were constructed in Enkanini and Enkanini thus enrolled as the place of testing. This can be observed as an exclusion of the offer by Stellenbosch University to construct the dwellings and conduct the testing at their Solar Roof (Keller 2012:79), and instead enrolling the context-specific knowledge of the intervention when constructed in Enkanini. The decision is recollected by van Breda at the TsamaHub: "*There was some good arguments at both sides, but then it was decided to rather do it in Enkanini – and that turned out to strategically be a very important decision*"(van Breda 2016). The construction of the shacks in Enkanini, led to the enrolment of a set of other actants, described below.

In order to measure the thermal comfort performance and social factors of the shacks when located in Enkanini, three participating households [49]where enrolled. The process of identifying the households was highly impacted by the personal relationships and local knowledge of Madiba Galada (Keller 2012:81), in order to ensure that *bona fide* residents where selected. The households where enrolled by using contracts drawn by a legal firm, defining amongst other items the contribution of the researcher and the households[50], the ownership of the improvements and the installed assets, and a dispute resolution clause involving mediation by Madiba Galada in the event of an disagreement (ibid:86).

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[46] DC appliances use about 2/3 less energy than the traditional AC appliances (Smith 2016).

[47] Thermal performance refers to a statistical comparative analysis of the correlation between indoor and outdoor temperature, their absolute levels, magnitude of differences and rates of change over time (Keller 2012: 20).

[48] Thermal comfort performance also includes the human dimension to the thermal performance matrix (Keller 2012:20) understood as the behaviour of the residents in order to manage the thermal performance, e.g. turn on air condition or open the windows, or as observed by the researcher in Enkanini, let the children play outside with no clothes and cook outside in order to prevent extra heating inside the shack (Keller 2012:21-22).

[49] The particpant households where Nosango Plaatjie in the iShack, a single mother of three children, freshly relocated to Enkanini and living in poor conditions; Victor Mthelo in the retrofit, with his wife and two children, both working; and Mthethelele Kohliso in the control shack, who was creating a new home for his girlfriend and son in Enkanini (Keller 2012:82).

[50] In example, Plaatje agreed to cook lunch during the construction period, and Mthelo and Kohlisho agreed to help construct the iShack (Keller, 2012:85).

One of the factors that could challenge the OPP [51]was community criticism leading to for instance vandalism. Whilst there were no official leadership structure in Enkanini to communicate with the municipality, there where instances of local committees acting with some level of leadership. Their approval was essential in order to set up the shacks and dissuade criticism, however the researcher only applied to the committee led by Madiba Galada and therefore it can be observed that the other local committees in Enkanini, were excluded and not given the opportunity to enroll/not enroll in the project. The risks of social complications were further reduced by gaining the endorsement from the Stellenbosch Civic Association councillor (Keller 2012: 84). Additionally, the municipality was enrolled by a formal process of project proposal, including the Informal Settlement Department, the officer responsible for registering new informal settlers in the municipal area, and the local councillor of the Kayamandi Ward 12(ibid.:85).

With the enrolment of the participants and the different levels of leaderships approval, the shacks where set up. However, in order to measure the thermal performance of the shacks, Wireless Weather Stations and Data Loggers where installed in all three participating shacks in order to record individualised temperature observations (Keller 2012:23) enrolling another actant in the network. The measuring device can be observed as an inscription device in its explicit definition (Callon 1986:X); a tool to translate the temperature shifts into written data.

5.4 Stabilised by the research findings

After two months of monitoring, the actor network was stabilised by the research findings illustrating that the iShack had improved both thermal performance and thermal comfort performance. By drawing on the different forms of knowledge from both academic and non-academic stakeholders, the researcher was able to design and construct two shacks, and by the enrollment of a set of household participants through contracts and the assistance of a measuring tool as an inscription device, the researcher was able to mobilise the network when presenting the findings in written, statistical form.

However, I claim to observe that also the TD researcher functioned as an inscription device, in the sense that the researcher selected and integrated the knowledge necessary to produce a solution. He inscribed the knowledge from word of mouth during interviews and discussions; participatory observations; and literature review, into the design of two shacks. When the shacks where tested, their material substance also was inscribed into the solution-oriented knowledge, I claim that the inscription is powerful, by the means that it would take efforts to oppose the inscription. An opposing argument could for instance question the researchers role as an activist rather than a researcher, however when

[51] Another actant that could interupt the OPP, was if one of the frequent fires broke out and resulted in the dwelling interventions being burned out, not able to provide test results. However, this was a risk they took in order to gain context-specific knowledge from the testing in Enkanini.

the findings show that the model works, that kind of questioning is rather irrelevant. An overview of the different actants inscribed by the researcher, are summarised in the below table.

Table 3: Actants involved in the production of evidence

Actant	Action
ISUG	Spokesperson for the TDR project Managing relations between the community and the others
Andreas Keller	TDR student, intermediary between the different forms of knowledge, inscribed the knowledge into written evidence.
Existing knowledge on ecological fitting and electricity	Inscribed through literature review, i.e. does not act, however impact the evidence
Electricity professionals, NGOs, and energy providers	Their expert and experienced knowledge enrolled through interviews, inscribed to written knowledge.
A selection of residents in Enkanini	Experienced, context specific knowledge inscribed through interviews and household visits
Two dwelling interventions, the iShack and the retrofit	Testing the knowledge. Constructed in Enkanini.
The household participants	Enrolled by Madiba Galada and legal contracts. Measuring the thermal comfort performance.
The councillor, the municipality, local leadership committees	Endorsing the testing of the knowledge, in Enkanini. Providing support in case of community resistance.
The measuring equipment	Measuring the temperature in the interventions. Inscribing temperature conditions into statistical data.

5.5 Uptake of knowledge in science

As we have seen, the production of solution-oriented knowledge included both human and non-human actants in the process. The knowledge is inscribed into statistical findings and papers that can be presented to the scientific audience and society for uptake. Desired TDR outcomes are findings that are relevant for both science and society (Michel et.al. 2013:12-14). In regards to science, the evidence and lessons learned were presented to the relevant audience, emphasised in the following quote: "*so they* (i.e. the students*) were absolutely very good in capturing the learning that were generated. They published a few academic articles, went to conferences and presented those findings" (*PM NGO 2016). In addition, the ISUG students produced their theses, and van Breda at the TsamaHub is including a chapter on Enkanini in his doctoral thesis on TDR (van Breda 2016). Further, the knowledge was taken up in the sense that a research centre was constructed in Enkanini, ensuring further collaboration and co-production between the community and Stellenbosch University. Also the solar service provider gained from the advancement on knowledge that will occur in the following chapter, in the sense that they were able to test, modify and adapt their system, and today are currently testing two similar solar systems for a wider uptake, based on the experiences in Enkanini (Smith 2016).

5.6 Uptake of knowledge in society

According to Lang et.al. (2010:28-29), implementation and adaption of the solution-oriented knowledge is the last step of a TDR process. In regards to the uptake in society, the evidence can be observed as a black box, in the sense that the users does not need to know or understand the work behind it and the different actants that has been involved, in order to use it or give it meaning. The evidence is a network that has been stabilised. In example, the Gates Foundation does not need to understand the technology behind the solar system, before making the decision to fund it. As one of the researcher recalls: "(…) *it is really about doing all the work yourself, and then go[ing] to the municipality and present[ing] to them how the system function[s]*" (Wessels 2016). In this relation, it is key to describe that the uptake in society by establishing a social enterprise was not something that was expected when initiating the research project in 2011. Van Breda put it as follow: "(…) *in the beginning we did not know it would go in that direction at all, it was something that emerged. (…) it was an unintended outcome, that happened because of certain funding, especially the green fund, which came our way*" (van Breda 2016). [52]As the TDR process does not necessarily end when the knowledge is presented, I will in the following section

[52] Further, the main researcher involved as an intermediary in the knowledge production process, emphasise quite clearly the divide between the research and the enterprise *"So I think it is useful to make a distinction so the iShack name has been linked to a social enterprise that we started three years ago, but before that, when I was doing my research on energy and dwelling upgrades – that's kind of where the term came from, so I used it in my research and then afterwards some of the research findings where used by a team of us at the SI to build a social enterprise*" (Keller 2016).

follow the evidence in society and analyse how the network transformed when different actants enrolled.

5.6.1 Reformulating the identity of the residents and the municipality

Building on the evidence produced, the research group and the co-researchers are able to reformulate the identity of the residents and the municipality. First, the residents of Enkanini had the identity of waiting and trusting the government to provide services, whereas now they are provided with the agency to act if they join the network: by a few improvements in the building material used and by installing a solar system (through iShack), they can take action in their own hands.

Second, the municipality which through the Free Basic Services program are mandated to provide Enkanini with electricity, had excluded electricity by mainly focusing on water taps and toilets. However, they are now provided with an alternative solution which has the potential to solve issues[53] and thus also required to act, i.e. either support the intervention or ignore it.

During this reformulation of identities, a new OPP can be observed: if the residents of Enkanini want access to electricity, and if the municipality want to fulfil their mandate to provide electricity to Enkanini - they had to go through iShack. However, for iShack to be scaled up, a sustainable model had to be developed.

5.6.2 Enrolling funding from the Gates Foundation

One of the actants important in relation to the scaling up the project is the Gates Foundation. The constructed evidence played an important role in securing funding to take the project further, illustrated in the following quote: "*So it was based on that evidence (*i.e. the result of the testing*), that the SI applied to the Gates for founding"* (PM local NGO 2016). The project proposal based on this evidence can thus be observed as an interessement device, by the means that the Gates Foundation enrolled when providing iShack with R2.1 million with the aim of developing a financial, governance and maintenance model to scale up the impact to a maximum of 100 iShack systems (Swilling et.al.2013). When the Gates Foundation enrolled, they had agency to change the network in the sense that they put a timeframe for delivery on the model and required more formalised structures. As illustrated by one of the NGO partners: "*they (*iShack*) had a pipeline of 100 iShacks to roll out, and the kind of people they hired where project managers, and they wanted to make sure the targets got met and the system worked (…) they had implementation targets to meet and were pressured for time, which we were not responsible for, so we had the luxury of time*" (PM local NGO 2016). The enrollment of the Gates led to

[53] (I.e. volatile relationship between the residents and the municipality, the cost of providing electricity, the difficulties of Enkanini eviction order).

the enrollment several other actants; in fact their enrollment may have been crucial for implementation in society.

5.6.2.1 Enrolling a manager, a business plan and the Green Fund

The enrollment of Gates led to the employment of a manager[54]. When the manager enrolled, he also had the agency to change the network as he was responsible for designing the business plan and the strategic direction. In example he suggested to only focus on the electricity function of the iShack. This is observered in the following quote: "*This was a pilot to see how these technical ideas could be delivered into a community in a sustainable way. And pretty quickly that became focused on electricity needs rather than a wider suit of services*" (Conway 2016). The decision can be observed as an exclusion of the ecological fitting feature from the network above. Additionally, this decision was impacted by the enrollment of the Green Fund, illustrated in the following quote: "*Also, realising that we would need more funds to achieve an economy of scale to make the service sustainable, we put an application into the Green Fund for a much larger grant, and proposed using the Gates money as a starter. When we got Green Fund approval they required that we narrow down the activity to the delivery of an electricity service using a social enterprise model. They were uncomfortable with the idea of using state funding to upgrade shacks "*(Conway 2016). The Green Fund enrolled by contributing R17 million to actualise implementation at scale (Swilling et.al.2013). After this funding came through, the Sustainability Institute Innovation Lab (SIIL) was constructed; "*We set up a separate business, which was then 100 % owned by the institute"* (Conway 2016).

5.6.2.2 Enrolling CORC/SDI, enumeration and the municipality

In the Gates project proposal, CORC/SDI was identified as a project partner, who would assist in initiating community engagement through savings (Conway 2016). CORC/SDI enrolled and initiated the process of enumeration in collaboration with the municipality. This led to the inscription of the settlement and its infrastructure into a set of statistical data; house numbers on every shack; and the division of Enkanini into nine zones (CORC 2012). This data functioned as an additional motivation for the municipality to enroll in the iShack project (Robyn 2016). Not only where the exact number of households and their conditions inscribed from word of mouth to a piece of paper, the report also identified electricity as the main urgent needs from the view of the residents (CORC 2012). The manager of the Informal Settlement Department put it as follows: *"(…) so the iShack came at the right time when we were looking at some sort of alternative form of energy*" (Robyn 2016).

However, the enrolment of the municipality came with implications. Many of the residents saw iShack as an easy way out for the municipality to provide solar, not grid-connected electricity (Wessels 2016).

[54] He had been involved in the iShack only after the Gates Founding came in, initially as a consultant (Conway 2016).

This was mainly due to the political aspect of electricity, illustrated in the following quote by one of the iShack agents "*the politicians when they come, they promise you heaven. They tell people they will get free education, free electricity, free all things – but at the end of [the] election, you don't even see them*" (Daniel Video). The implication of the politics of electricity is further explained below: "*the community initially rejected the idea of a solar electricity service, because they saw it as an inferior alternative being driven by the municipality instead of providing the gold standard, which is the connection to the grid*" (Conway 2016). On the municipality´s side, the lack of resources was emphasised "*but if you don't have the money, and you don't have the resources, you must make another plan. And make sure that the community understand[s] that it is an alternative plan, that there is no money at this stage for the preferable alternative*" (Robyn 2016).

The enumeration further contributed to identifying clients to the iShack project based on their house number and GPS coordinates, as illustrated by one of the researchers: "*(…) so those house numbers were very important and then it was also easier to identify the clients, so each solar system is recorded through GPS*" (Wessels 2016). However, CORC and SDI´s attempt of establishing savings groups, in order to engage the community and establish a platform to communicate with the municipality, did not initially gain traction *(*Conway 2016).

5.6.2.3 Observing the enumeration as a technology/black box of best practices

While there could be many reasons why the Savings Group process did not take off at this stage, one explanation could be observed by analysing the enumeration as a technology, understood as a method that appears as generic and applicable to different contexts (Ratner 2013:169). The decision to conduct enumerations in Enkanini was based on similar projects in Thailand, Uganda, Cape Town and Langrug with successful results.[55] When observed as a standardised technology that transforms material substance (i.e. the informal settlements and its residents) into statistical data, one of the reasons for why the Savings Group did not succeed, may be that the data failed to represent important aspects of the settlement, such as political tension or personal feelings. Another reason might be that applying a black box of best practices did not recognise the different contextual features between Enkanini and Langrug. The following quote from the technical manager illustrates the challenging context of Enkanini*" And I have seen many informal settlements since then, in Uganda, Kenya and Ghana, and nothing really compares to what Enkanini was*" (Sheridan 2016).

[55] The technology of (incremental) settlement upgrading was an approach adopted from Thailand, where organised groups in informal settlements take part in developing their community through an alliance with their government (ISN et.al.2011). Enumeration is the first step of the approach, with the goal of gathering data about the population, the settlement and the existing infrastructure. This model was adopted by CORC, SDI and in 2010, after successful projects in Uganda and Cape Town, Stellenbosch municipality got on-board and initiated a pilot in Langrug informal settlement.

A third reason may also be that the residents viewed the enumeration as a way for the municipality to gain control, as the municipality was quite top-down in their approach. One of the researchers recalls the first meeting when the enumeration where discussed: *(...) it was SO top down, and it just showed that they didnt understand.. they just felt like this was the recipe they could use to create some amazing relationship between Enkanini and the municipality and all the problems would be solved*» (Von Der Heyde 2016). The top-down approach can further be observed by the municipality themselves: "(…) *our relationship with CORC was also based on that the municipality is very good on being top dog"* (Robyn 2016).

5.6.2.4 The dis-enrolment of CORC/SDI

A while after the enumeration, CORC dis-enrolled from the project. It can be observed tensions in the way that the NGO and the iShack project wanted to do things. Whereas the NGO was enrolled in order to contribute with the community engagement aspect of the model, it can be observed that they did not perceive that they had the agency to do so: "*Basically we were quite surprised we got invited into a space that was already designed. (...) in the beginning the language was all about collaboration, community participation and local ownership, but then the set-up was already designed*" (PM NGO 2016). One of the researchers at SI on the other hand, questioned whether CORCs approach was suitable in Enkanini due to the high level of political volatility and the low level of readiness of the community (Wessels 2016). However different views on the process, the NGO project manager reflected that: *"I cannot see how this could have played out differently given all the issues; the municipality interfering; the weak community leadership; the delivery target pressure– the different ideas of how to put a model together. So I think the lesson to be learned is that project preparation is very important"* (PM NGO 2016). To date, the NGO is involved in Enkanini again seeking to establish savings groups, and the low-key collaboration between the NGO and iShack seems to be producing positive results; savings groups have started to form (Conway 2016).

5.6.3 (Co-) producing the payment, solar and operational system – the script

The enumeration was carried out and gathered a lot of data, but in order for the SIIL to produce a sustainable model they had to design a payment, technological, and operational system, illustrated below.

5.6.3.1. The payment system

The project and the co-researchers continued collaborating, amongst other items on how much the residents were willing to pay for such a service, a suitable payment method, and what their preliminary energy needs were (Swilling et.al.2013) thus emphasising the experienced and procedural knowledge of the co-researchers when producing the model. The co-researchers were also important in identifying potential clients; they identified the first 20 pilot customers (ibid.), recounted as follows: "(…) *the*

assistance of the co-researchers who went to their friends and offered the service. The pilot was done in this way, a door-to-door way through people's family and friends. It builds more resilience when you know the people who are participating" (Wessels 2016). When the pilot systems had been installed, the approach changed to include more effective marketing, with flyers and open days to sign up: "*This was important as a strategy of engagement and how to not be considered as a political agenda; just offering a product and nothing more, depoliticizing the method of getting the solar system to peoples houses*" (Wessels 2016). The marketing approach was a result which occurred after an attempt for stakeholder consolidation before implementing the pilots "*where the municipality, SDI, CORC, the iShack project, ISN and the supposedly community leaders at that time came together at the SI, and it got quite heated – the sustainability was put aside and it was more a discussion of other issues like the community leaders demanding electricity, and the removal of people from the landlines*" (Wessels 2016). The decision to sell a service rather than trying to build community engagement can thus be observed as a politically smart decision, based on all the tension between the community and the municipality. However, it was also a decision impacted by the timeframe of the funding: "*We had secured this money against a budget, where we said we where going to roll out so many clients a month, and we had to report on that. So we didn't really have time* (i.e. for the community engagement and their approval) (Conway 2016).

5.6.3.2 Solar system and appliances

The knowledge gained from the co-researchers was then shared with the technology provider, Specialised Solar System (SSS), who designed and thus enrolled a set of DC appliances suitable for the residents; indoor lighting, outdoor security lights, a cell phone charger and a flat screen colour TV (Smith 2016). "*TD made it possible for a private company to engage with the researchers and then change their technology based on the feedback from the users, facilitated by the researchers. (…) a big thing now is to try to gain access to informal settlements in the urban spaces for any company to sell products, but it is extremely difficult. So the researchers created an opportunity to gain marked access to this space* (Wessels 2016). However, as SSS was established with the goal of lighting up Africa, the participation in the iShack project was about more than marked access: "*Our expectations were that, if we could put as many pilots that could be inspected, written about and analysed, it would be our benefit (…) to see the feedback not only from the settlement but from the people who have the resources to research this around the world*" (Smith 2016). One interesting event in this regard, is that the SIIL and SSS had to negotiate with the Gates Foundation in order to enroll SSS as the technical provider, recollected by Carlos Smith: "(…) *one of the big hurdles was that they (the Gates Foundation) thought that SI were really backwards in thinking that they wanted to use a South African local company as their technical supplier and advisors*" (Smith 2016). This could be observed in relation to the dominance of the Western

knowledge production described in chapter 1.2.4, where expert knowledge from e.g. African institutions are given less value and power.

5.6.3.3 The operational system

Simultaneously as the technical system and the payment options where produced, the operating system was created which centred around the concept of an energy hub that governs a network of trained community solar entrepreneurs called "hub operators" which would market, install and maintain the systems as well as handling the clients (Swilling et.al.2013). The goal was that eventually the hub operators would become franchisees and manage their own hub, whereas the SIIL was the franchisor. Six agents were employed from the settlement, through the formalised procedure required by the funder, recollected by one of the ISUG researchers: *"the procedure had to be more structuralised (…) it had to go through a formal process of putting an ad for the job, and everyone had a chance to apply, and going through a fair process of going through CVs and interviews"* (Van der Heyde 2016). All four co-researchers where invited to apply for the first hub operator position; two did and one co-researcher got the job. It can thus be observed that the operational system, by using a formalised structure to enrol hub operators, created a more formalised relationship between the project and the co-researchers than before, where only one of the initial researchers made it into the formal project. This event is recollected by one of the researchers as follows: "*They (*the co-researchers) *were not unhappy of not becoming hub-operators, but unhappy for not being part of the process anymore, assisting with clients and so on. The co-researchers invested so much in setting this up, but when the big money came in, some were outperformed as we had to follow a more open market approach to recruit people"* (Wessels 2016).

Additionally, a technical manager was employed to manage the set-up on the ground, develop a procedure for the installation of the system, train the iShack agents, and iteratively adjust the system (Sheridan 2016). In the beginning the technical manager and the agents would have weekly training at the SI with SSS, concerning how to deal with the customers, standardized procedures of how to install a system, quality checks, maintenance, how to deal with an angry client and more. This was done in order to produce a manual for the agents, however it was based on iterative feedback and adapted to the context of Enkanini, illustrated by the technical manager: "*we where all co-developing the system within the context of Enkanini*" (Sheridan 2016). SSS are still involved in training today; "*our role, even up to today, is technical support and [an] advisory role. For the advisory things we don't charge, the training we do free of charge. So we are available at any point of time for the iShack agents*" (Smith 2016).

5.6.3.4 A change in policy

Regarding the financial system, it was based on creating a sustainable model "*in which the community participates and benefits, but also makes financial contributions, in a way that is financially sustainable.*

So it's not continuously grant funded" (Conway 2016). Even though the municipality had been supportive of the project since the start, "*It was when the project reached its sufficient scale and efficiency Conway succeeded in negotiating that the municipality would pay the +/- R50 per household, per month through the free basic electricity grant* " (Sheridan 2016). After a process of 18 months, the municipality changed their Free Basic Electricity policy. Normally, the subsidy works as follows: "*if your household earn[s] less than 3000 rand a month, and are connected to the grid, you can apply for the subsidy. It is not a lot of money. It covers 50 kWh, enough for a light, a TV. But it is a whole process. You have to apply, submit affidavits, provide proof of income, marital status, etcetera- it is a whole lot of work*" (Conway 2016). "*What the iShack tried to do was to tap into that subsidy, because in the end of the day, it is still an informal area, so most of the recipients qualified for subsidies*" (Robyn 2016). What happened was that the iShack project was able to receive the subsidy on behalf of their clients, making it easier for the residents to receive their subsidy (however through iShack) (Conway 2016). The municipality can be observed as an important actant in the process of establishing a financially sustainable business model for iShack, where the municipality simultaneously became closer to fulfilling their mandate in the Free Access to Basic Services Programme.

5.6.4 Description

There are in particular three negotiations that are key to describe during the implementation of the system. The business model including the financial system and the operational system, can be seen as a script, i.e. assumptions about how the technology and the actors will evolve in particular ways (Akrich 1992:208). When implemented in the real world, the script may be adapted and this is what is called de-scription, the adjustment between the user and the designed user and the technology (ibid.:209).

5.6.4.1 The prescripted user

First, as the model is based on a business approach, i.e. selling a service, it can be observed as a script[56], which automatically excludes those residents who cannot afford or do not want to pay for a service that should have been provided for free. This has lead to a lot of tension, and instances of service delivery protests involving riots and vandalism of the hub (Sheridan 2016). The tension is illustrated by the municipality: "*On the one hand, we see that more and more of the systems are being set up in Enkanini, on the other hand the community is approaching the municipality all the time for conventional grid electricity*" (Robyn 2016). One reason may be that, as quoted by the solar provider: "*Even residents in the most rural areas of South Africa has heard about the grid* "(Smith 2016). The paradox of a community demand for grid connection versus an individual need for electricity is however acknowledged as important: *"(…) as a community, their rejection of solar electricity is valid and legitimate, but as an individual, a household makes a different decision. It may seem like a contradiction,*

[56] Script is here understood as the vision for the world with the technology in it.

but I don't think it is" (Conway 2016). However, the exclusion of residents is something the project is currently working on; "*We are motivated to find a model (…) so at least everyone can have clean lights at a flick of a switch, no more candles or paraffin, and that is our challenge*" (Conway 2016). Additionally, the excluded residents can be observed as a threat to the system, in the sense that they use paraffin and candles that can lead to fires, also damaging the houses and the solar systems of the clients.

5.6.4.2 Adapting to user needs

Second, the appliances developed by SSS and their user manuals can be observed as a framework for how the energy from the solar panels should be used by the clients, thus limiting the usage to only specific DC appliances and where they depend on iShack for repairs and maintenance. This is explained by the municipality: "*It* (the solar system) *doesn't provide enough energy - the people also want, I wont say luxuries, but the conveniences that make your life easy like a washing machine, a small stove or other. Currently the electricity provided through iShack does not meet that demand*" (Robyn 2016). SSS created a system to regulate the input power and the storage of the energy, however they found that "*typically, because of lack of appliances, people would put an invertor on there and damage the system*" (Smith 2016). In order to avoid all the systems breaking down, the restrictions can therefore be observed as important. However, the SSS adapted by learning that "*once you meet a need, you create a want (…) the system needs to be open ended, we need to be able to add more appliances to it*" (Carlos 2016). SSS were able to add fridges as an extra appliance, at an affordable price, and about ten fridges have been installed so far in Enkanini (Sheridan 2016).

5.6.4.3 iShack agents strike

Third, as the community demanded grid, the client list grew. In the script, the identity of the iShack agents was that they were paid by the number of systems they installed, and eventually they would have their own franchise (Conway 2016). However, the increased number of clients also increased their workload, as illustrated by the technical manager: "*as the number of systems in the community grew, so did the amount of maintenance which was required to be done and we reached this perfect storm where we installed 70 systems a month, but also had to do all this maintenance* " (Sheridan 2016). So the iShack agents came with demands to the project, using their agency as agents to demand a basic salary. Their demand was heard and the project adapted the payment structure by providing a basic salary together with a commission per installation, however "*at the end of the day they where basically making the same amount of money*" (Sheridan 2016).

The agents then went on a strike, using their agency to negotiate their identity in the network. However, the outcome was that five out of six agents where dismissed: "*the agents went on strike, and the whole notion of building this team towards ownership of their business completely fell apart. And we*

went through a whole process of disciplinary procedures, and when it wasn't resolved, we brought in a facilitator, *but eventually five out of six of the agents where dismissed. We where left with one*" [57](Conway 2016).

The iShack agent model was then modified, illustrated by the technical manager: "*How it was before was that each agent was capable of doing all tasks, which meant a lot of training given to each and every agent both the administration, the installation, the maintenance. So after the strike - the dismissal, we split the business into maintenance teams and installation teams*" (Sheridan 2016). Today there are 7 local residents employed by the project (SIIL, n.d.).

5.7 Outcomes of the project

As we have seen the implementation of the knowledge in Enkanini involved several actants, amongst other the funding parties; the Gates Foundation and the Green Fund; the manager and the business plan; the municipality changing their subsidy; and the co-researchers identifying the first clients. Further, the enrollment of the different actants led to challenges in the network, which is natural when transforming from a research project to an actual project. The different actants and their roles are summarised in the below table.

Actants	Their role and actions
The Gates Foundation	Enrolled by funding, change the network imposing a timeframe and more formalised structure
Manager	Enrolled by employment. Change the network by excluding the ecological fitting. Responsible for the enrollment of the Green Fund and the business plan.
SIIL	Enrolled by the business plan. Separate from the other institutions. Enrolling the tender from the municipality to provide electricity in Enkanini.
The Green Fund	Interessed by a project proposal, enroll by funding the project.
Enumeration	Technology which translated the residents and the settlement into written, statistical data. Provides the shacks with addresses, GPS locations and divides Enkanini into nine zones. Function as a client base for iShack, and motivation for the municipality to enroll.
CORC	Enrolled by the Gates proposal as the partner responsible for community engagement. Conducts the enumeration with the municipality. Dis-enrol when Savings Groups does not succeed, and as the project focus on marketing/business approach.
Municipality	Enrolled by enumeration, change their policy for subsidies, now able to support the delivery of off-grid electricity to Enkanini.
Clients	Identified by enumeration and co-researchers, enrolled by the business model as they prioritise individual need instead of community demand.

[57] Daniel is the iShack agent referred to when using the video as reference.

	Their usage of the electricity is controlled by the user manuals and the appliances. The clients identity shaped in the script, as residents willing to pay for the service.
Specialised Solar Systems (SSS)	Enrol as the technical provider after negotiations with the Gates, produce the solar system and the technical appliances
Co-researchers	Contributes by experienced, local knowledge. Responsible for enrolling the first clients based on personal knowledge. Only one of the co-researchers enrols as iShack agent, due to formalised application process.
iShack agents/hub operators	Enrol to formalised application procedure. When client base increase, they negotiate their role in the network by striking. Only one out of six continues as an employee. More agents are subsequently employed

Even though the iShack project has had several challenges, observed as negotiations in the actor-network, there are several outcomes that are key to describe. First, the eviction order is no longer in place according to the municipality: "*there was a council outing a few years ago which suggested to expand the eviction order. Originally it was against 100 people, but as there is now 3300 structures, means that the court order has to be expanded to 6000 individuals. Furthermore reason, the council stated that the municipality has to provide the alternative, i.e. alternative accommodation. Basically, I don't think the municipality is going to pursue the eviction order anymore, because, as I said, we can't provide the alternative under normal circumstances, let alone if we are forced to deal with them. It is just not feasible*" (Robyn 2016). In turn, this leads to an acknowledgement of Enkanini and its residents and the municipality changed their subsidy so iShack can claim the Free Basic Electricity subsidy on behalf of their clients in Enkanini.

Second, "*Enkanini is quite literally a shining light*" (Sheridan 2016). There is significant amount of public lightning as a direct result from the security lights in the iShack, making Enkanini a safer place then before. People have access to electricity and cold storage in fridges (ibid). Even though the system excludes the ones who cannot or will not pay for the service, it is important to remember that before iShack, the community only had illegal connections, paraffin and candles, which they also pay for. Now another product has been added to what is available for electricity.

Further, the project has created job opportunities and vocational training for the residents in Enkanini. By April 2015, 14 residents had been trained on a range of skills, from installations, maintenance, marketing and administration, and seven residents are currently employed (SIIL n.d.). Additionally, increased community organisation can be observed as well, recollected by the technical manager "*what we did find at the end of the project, when we tried to mobilise people in a workshop or through*

marketing, it was actually quite easy and we would have crowds between 30 and 150 people come" (Sheridan 2016).

5.7.1 Can the network be mobilised?

While there have been real results for the people living in Enkanini, my focus is to determine whether the network can be observed as stabilized or not. A stabilised network is related to the concept of alignment, understood as to which extent the motives and interests inscribing into the practices, institutions, and strategies pull in the same direction while serving the same purpose (Braa et.al. 2004:342). Whereas the different actants have personal motivations and interests, such as the solar service provider advancing their technology in order to improve their products, or the hub operators and iShack agents who do their job to earn an income, I cannot conclude that these motivations are contradicting the network´s overall objective. It can rather be observed that the different actants are working towards the same purpose; that the residents of Enkanini shall have a safe source of alternative electricity. A stabilised network may also become mobilised, in the sense that one actant can become the spokesperson for the whole network. There have been many lessons learned and knowledge produced as the model now presents an alternative, incremental response to addressing energy poverty. When presenting these to an external audience, yes, the network can be mobilised. However, the network is still challenged by several factors. First, the excluded residents challenge the stability of the network as they continue using flammable sources for electricity. Second, the production of a solution for in situ upgrading, which in turn leads to the exclusion of parts of the residents, is better than the starting point, but does not reflect the needs of those not able to pay for the service. Third, the community demand for grid connection can be observed as a challenge, in the sense that if the municipality or any other actor finds a miraculous way to enable the grid connection, the network will loose its function as solar systems most likely will no longer be in demand. Fourth, the project has created another mode of dependency in the community, i.e. the network will fall apart if SIIL pull out from the project, and the residents of Enkanini would no longer have a safe option for electricity provision.

5.8 Part-conclusion

In this chapter, I have applied the ANT in order to analyse the processes in a TDR project from knowledge production to implementation. In the first section, I opened up the evidence constructed in order to visualise the roles of the different actants in the phase of team building and co-production. By spending time building relationships and trust in Enkanini, the research group established three locally defined problem areas. By taking an intermediary role, the TD researcher was responsible for

integrating and communicating the different knowledge and insights to the various people involved. However, this can be observed as a necessity due to the complexity of Enkanini, and the challenges of gathering different stakeholders at the same location and time. Further, the test-period of the two shacks was dependant on the household participants and the measuring equipment in order to inscribe the results into research findings. By presenting the findings in articles and at conferences, the researcher was able to mobilise the network without actually bringing the shacks, the measuring equipment, and the households with him to other locations.

In the second section, I analysed how the evidence was taken up in the scientific community and in society, with a focus on the latter. The TDR project enrolled funding and transformed into a social enterprise in order to implement the produced solution. There where elements of co-production and adaption also during this phase that was derived from the personal and experienced knowledge from the co-researchers, the expert knowledge from the solar provider and the feedback from the users and hub-operators. However, the implementation phase was without a doubt the phase where most challenges and negotiations occurred in the network. When analysing the iShack model as a script, I was able to identify how the implementation led to the exclusion of some residents; provided a framework for how the electricity could be used; and gave an identity to the iShack agents.

What becomes clear is that a very rigid TDR approach for how to co-produce, implement, and adapt a project would not have worked in this context. As illustrated by one of the ISUG researchers when asked what could be learned from iShack: *"(…) to do a project and experiment together (*i.e. with the residents*) and not have this framework that makes the research too rigid. So letting stuff emerge was important"* (Van der Heyde 2016).

In the following section, I will discuss how these findings can be compared to the Doing Development Differently approach. Can a project based on a TDR approach, simultaneously and without unintended consequences, implement some of the DDD elements?

Chapter 6: Discussion

In this thesis, I have applied the theoretical framework by Ernesto Laclau in order to examine the two concepts Doing Development Differently and Transdisciplinary Research and Actor Network Theory to investigate the concept of TDR in a case study of iShack in South Africa. In the following, I will elaborate on the findings and on how each analysis has contributed to validate my hypothesis that: "*By involving local stakeholders and solving societal, local problems, transdisciplinary research is a way to Do Development Differently as defined in the DDD-Manifesto*".

6.1 Conceptual findings

In the first analysis, I investigated the signification of DDD and TDR, respectfully. By observing the DDD communication as articulation, I found that the DDD community established an antagonistic border to what it is seeking to be different from, namely best practices and predefined solutions. This antagonistic border has the function of stabilising the meaning of what it entails to do *development differently*, as different principles, objectives or elements become related in a chain of equivalency for the main reason that they are different from "the other". The elements in the chain gather around DDD in order to stabilise the meaning of DDD, and thus I identified a DDD discourse. Further, I found that TDR functions as a floating signifier, describing all research practices or forms of knowledge production that are different from traditional, rigid disciplinary paradigms. By focusing on solving complex and real world problems - in collaboration with stakeholders with an interest in the issue, TDR offers a participatory, inclusive mode of knowledge production. These findings have several implications.

6.1.1 Where is the line from defined to rigid?

First, I have visualised the challenge of balancing the line between structured elements and rigid approaches. I analysed DDD and TDR as concepts or discourses which create their identity by seeking to move away from the predefined practices which involve but a few actors *who knows what works* in development and knowledge production. Instead they emphasise collaboration, flexibility and adaptation. This has implications, as in order to not have meaning and not merely be a critique (or an empty signifier); it is essential to provide alternative tactics. For the DDD community, this is a set of six principles illustrating their perspective on *what works* in development, proposing that following those will lead to real results for real people. This is challenging, as DDD thus risk becoming what they seek to move away from; yet another best practice for how to do development. TDR on the other hand, where scholars seek to impose their definitions on others, where guidelines and perspectives on how to do TDR in practice are offered and the validation of the knowledge discussed, is faced with the challenge of becoming yet another form for research, dependent on rigid methodologies and peer reviews.

6.1.2 From flexible principles to one overall feature

Second, as the alternative approaches cannot be rigid, there are implications for their usefulness. DDD solves the challenge of becoming inflexible, by providing a set of principles open for interpretation. They do not have a rigid definition of when something is locally owned in reality and on paper, or how politically smart one can be without becoming political. Flexible indeed, but how are they useful? My understanding of a principle is that it is supposed to guide ones behaviour. However, as the DDD principles are open and vague, it may be a simple task to endorse them, but challenging to consult them for behavioural advice. Even the DDD community acknowledge that one of the constraints for a wider uptake, is that the development worker has little understanding for what the principles would imply for their daily work (Wild et.al. 2015:27). And in order to solve that, they provide a set of practical examples and case studies which illustrates how it was done and what the enabling factors were. However, as the world is filled with contingency, what worked in one particular context at one particular time may, or may not, work again. This is also acknowledged by Booth (2015:19) who admits that its doubtful whether the features which allowed four DFID-funded [58]initiatives to adopt a politically smart and locally led approach, would have been applicable again. Nevertheless, this evidence base of case studies illustrates that the principles do have potential and are more than a critique of rigid donor practices, and if nothing else may function as a motivation to keep supporting DDD.

However vague and flexible, there is one common structure that the development worker can lean on: consistently in all the principles, is the call for local knowledge – whether it is personal, procedural or propositional. As an example, in order to ensure that the initiative is legitimised on a political, managerial and social level, one has to investigate the perceptions of legitimisation in the context of implementation. The perceptions may be many, they may be contradicting each other and they may even be contradicting one´s own perception, but the identifications of them should be based on local knowledge (and not the donor-centric political economy analysis Fischer and Marquette (2014) critically describe). Another example is how local knowledge is important in order to be politically smart, in the way of engaging with local reformers and drawing on their knowledge and personal networks. The emphasis on local knowledge in order to collaborate with local stakeholders and adapt to the context, strengthens my hypothesis of TDR as a way of DDD, further elaborated below.

6.1.3 The relation between DDD and TDR

In order to analyse the connection between DDD and TDR, the antagonistic border played an important role. As DDD establish their identity based on what they are different from, and simultaneously have

[58] These were 4 out of the 7 case studies mentioned in the introduction, illustrating donors ability to fund adaptive and politically smart initiatives, from Booth and Unsworth 2014.

elements open for interpretations of what DDD entails; I found that any element[59] which does not involve blue print approaches and best practices, may be used to give meaning to DDD. I proposed that, by building on a form of knowledge production with stakeholders surrounding a real life problem, and by adapting to the local context when both identifying a problem, creating a solution and implementing it, TDR *cannot* be used to describe pre-defined solutions or already-made interventions, but would fit rather nicely into the DDD structure. Conceptually, the hypothesis is therefore valid; *TDR can function as a way of implementing DDD*. In order to reinforce the validation, I performed a case study of a TDR project in South Africa. In the below section, I will present the findings and how they can be used to strengthen my hypothesis further.

6.2 Findings from the case study

In chapter five I applied the Actor Network Theory as a theoretical framework to analyse how a TDR project evolved into a social enterprise. To be relevant for the overall hypothesis of the analysis and as TDR is a concept with several significations, I decided to do an in depth analysis of how this case was based on a TDR approach. In this section I will present those findings and discuss the similarities with the DDD approach.

6.2.1 Locally defined problems

As the starting point, I opened up the evidence that was produced in order to analyse which actants had been involved and what they had contributed to, from identification of the problem to presenting a solution. I found that initially the problem was defined by Stellenbosch University and the National Research Foundation, but after the process of building relationships and trust with the community, in addition to identifying local key change agents, the problem was redefined to include the particular context of Enkanini and the needs of the residents. This is inline with the DDD principle of focusing on locally defined problems. However, to define, refine and debate the problem with local stakeholders, calls for an environment of trust where the local stakeholders are willing to share their concerns and issues, and the development practitioner or the researcher is open to the possibility that these may be different than initially thought. The process of building trust and relationships takes time. In Enkanini, the researchers spent weekends and nights in the informal settlement, in addition to collaborating with one local resident with high status within the community. This implies that in order to identify what is really at stake the practitioner needs to spend considerable effort building relationships and/or finding local stakeholders interested in change. Further, as local stakeholders share their concerns and issues, there is a possibility that expectations for solutions will emerge. One of the researchers in Enkanini emphasised the need to manage these expectations as follows: "(…) *managing the expectation of the*

[59] As long as it makes sense. They have already borrowed from IT management, health programming and entrepreneurship and are open for what can be learned from other sectors.

users is very important, it can be very difficult for them to work with something which may not even result in something concrete, an outcome – so continue[ing] to talk in conceptual terms is very difficult" (Keller 2016). In order to deal with the expectations, another researcher emphasised the role of flexibility: "*one of the benefits I found as a researcher was that there was a lot of flexibility in our arrangement and I found that flexibility was one of the key factors of really managing relationships – because it is such a volatile environment and so easy to build up expectations from residents*" (Van der Heyde 2016). Locally defined problems may come at the price of expectations, and to communicate that you cannot solve all the problems or may not solve them as excepted is difficult, yet important.

6.2.2 Co-production

When the problem was identified, I found that the researcher played an important role by integrating the different available knowledge to come up with a solution. By translating local, experienced, and expert knowledge he was able to design two dwelling interventions that could solve the issue of not having access to the electrical grid and also improve the indoor temperature in the shacks. This may appear problematic; as it doesn't involve the co-production and participatory research that TDR calls for. Instead it was one person synthesising the different forms of knowledge, which gave him the power to include and exclude what he perceived as relevant. However, when faced with the challenge of getting the stakeholders together at the same time, with the further hindrance of the volatile relation between the municipality and some of the residents, co-production in a rigid team approach may not have been feasible anyway. In fact, Wickson, Carew & Russell 2006 (in Bernstein 2015) argue that a TDR process can involve one solo researcher as long as he/she is able to integrate knowledge from different disciplines and engage with the stakeholders in the process, which the researcher in Enkanini did. What can be learned from this is the importance of flexibility when defining co-production. If many voices are heard and many forms of knowledge integrated, it may not make a difference if it is debated in a team meeting or fused by one researcher.

I find it relevant to note that this was a TDR process in a community with approximately 6,000 residents, and it was still challenging to get the stakeholders together. In relation to the licence plate regulation I described in my motivation for this thesis, the problem is air pollution – and in order to include all relevant stakeholders in that process, wouldn't that call for involvement of anyone who breaths? While that obviously proves challenging, it would at least include spokesperson for the residents in Ecuador (both poor and rich), the car owners, producers and buyers, representatives from the public transport, the police, the government, environmental institutions, health experts, industrial factories, fuel producers, and not to mention those responsible for the fuel subsidy. Whereas co-production of solution oriented knowledge, where all voices are heard and respected, is one of the elements in the

ideal typical TDR process, it may be difficult to apply in practice when both problems and contexts are more complex than in the "western" world where the approach originates from.

6.2.3 Implementation

While the researcher was responsible for fusing the knowledge, I also found that the potential of the model was dependant on the household participants, the measuring device, and the approval to construct the shacks in Enkanini. Again, the local key change agent played a crucial role, comparable to the DDD principle of working through local conveners who can mobilise those with a stake in progress. Further, when the solution was tested, it involved stages of adaptation and remodelling before it could be implemented at scale. At this stage, co-production was more team oriented, in the sense that different stakeholders collaborated on creating a sustainable model. They started with 20 shacks, continued working towards 100 and then towards 1,500. In other words, they made incremental trials and pursued what worked while blending design and implementation through iterative cycles of planning, action, and revision - in line with the DDD principles. Amongst other, it was decided to only focus on the solar system and dismiss the ecological fitting, as energy was the main interest and need of the residents, and the materials to upgrade the shacks ecologically could easily be bought by the residents themselves. Further, they managed to influence the municipality so they changed their policy for subsidies and depoliticised the implementation by adopting a marketing approach of only selling a service. Implementation was clearly the phase which encountered the most challenges and negotiations with the different stakeholders - amongst other the local NGO dropped out as it did not approve of the marketing approach; the community collectively rejected the project while residents individually bought the service; and the local residents trained to install, repair and maintain the solar systems went on strike as the workload increased but the pay didn't. Whilst facing challenges and resistance, the project has succeeded in providing a clean source of energy to a third of the households of Enkanini.

6.2.4 Evaluating the outcomes

Lang et.al. (2012:28-29) emphasises that the outcome of a TDR process is not a classical form of knowledge transfer from science to society, but one that can have tangible and less tangible outcomes. The DDD community suggest that the outcomes of a DDD inspired initiative are "real solutions to real problems that have real impact: they build trust, empower people and promote sustainability". The outcome of the TDR project in Enkanini was a pilot model, which then was tested and implemented at scale. The residents of Enkanini now have access to clean electricity with the added benefit of increased security from outdoor lighting at night. Further, trust has been built between the community and their environment, and community organisation has been initiated. I would consider these as tangible outcomes, and a real solution. One can debate back and forth on the issue that while offering a service the residents have to pay for, it excludes the residents who are not able or willing to pay. At the end of

the day, a third of the households in Enkanini now have access to clean energy, which they did not before. On this instance, I relate with Ratner (2013:170): "*a solution is never only a solution, it also produces new issues*".

6.3 Implications for the development worker

Based on the above findings, I have validated my hypothesis both conceptually and empirically, and confidently propose that TDR can be a way of applying DDD in practice. Unfortunately, this does not provide any more clarity for its application. Both concepts offer indistinct principles and objectives open for interpretation for two reasons; in order to avoid becoming the rigidity they distance themselves from; and in order to avoid being observed as floppy concepts with no meaning at all. This implies that it is up to the individual to provide meaning to the concepts, which may be challenging, but at the same time useful, as it would lead to adaptation to each individual´s abilities and needs.

There are particularly three ways in which the researchers in Enkanini were successful in implementing the objectives of DDD and TDR. In order to avoid falling into the pitfall of providing a set of new best practices, they are only listed as such:

1. The researchers were able to fill and balance many roles, they were researchers, activists, negotiators, relationship brokers, employers and friends.
2. They were present in Enkanini consistently over a long term, and engaged with the residents in informal, non-structured ways, such as spending weekends over or having informal discussions.
3. They did not have an expert approach providing the solutions, rather an exploratory approach finding answers and learning together with the residents.

On another note, if one is to strictly apply DDD and TDR one needs to find motivated individuals, interested in spending lots of time in-country, which are able to build relationships and trust, are able to step out of their role as professionals with know-how, are open and respectful, and are be able to strategically communicate with actors from different thought-systems and levels of reality without imposing their accepted truths. These approaches to development thus require more than just an employee, a truly dedicated individual.

6.4 Theoretical implications

When analysing the concept of TDR, I found that the floating signifier and the nodal point had similar functions, when related to an antagonistic border. First, the floating signifier was observed as signifying meaning reaching beyond its linguistic definition, i.e. any form of knowledge production that is not rigid. However, as this meaning was constricted by not being located on the other side of the antagonistic border, I observed that the floating signifier could simultaneously function as a nodal point, stabilising

the meaning of TDR. This has implications as the two concepts which are theoretically different, became similar when applied in practice. When presenting this, I acknowledge that everything is contingent and do not always expect this to be the case when applied in other observations.

In the second analysis, I found that while the network was stabilised by the research findings, it required a human actant in order to be mobilised. As ANT is all about the *action*, I claim that in order for the research paper to mobilise the network, it has to be acted on somehow, i.e. it has to be read or presented. This leads me to question the way in which ANT puts all actants on equal ground, in the sense that while a dog might be able to get the newspaper, a meaningful mobilisation of a network as research findings, would require human thought.

6.4 Strategic implications

Whereas some may characterise DDD as "old wine in a new bottle" suggesting that they are similar to revolutionary approaches like Therkildsen in the 1980s and Chambers and Conway in the 1990s, the development sector today is characterised by a shift in roles and focus, willingness to talk about change, and there is no stabilised development discourse, so there is potential for change. If the DDD community really want to change the status quo of international development, I suggest that they communicate more strategically, among other things they could update and utilise their website more efficiently, starting with updating the number of signatories as it still reads 400, which was the number of signatories in 2014. Further they could communicate their beliefs more broadly, not only within the list of signatories, but approach new donors, fresh development practitioners and in particular the public in general - as in the end, the majority of donors are accountable to taxpayers. If the taxpayers are convinced DDD is a revolutionary concept, well what is there to stop it then?

For the TDR supporters, I propose to stop thinking about TDR as a research method as it automatically relates to questions of methodology and quality criteria. I suggest to rather describing it as a way for problem solving , which requires teambuilding and inclusion of different perspectives when creating solutions.

6.5 Recommendations for further research

In this section I provide recommendations for further research. I found that while the DDD communicates loudly about *what works*, there is less talk about *what does not work*. Yes, they do construct an antagonistic border to what they perceive as the main constraints for successful development initiatives, however these are rarely investigated further than the "donors need to be accountable to their taxpayers, or donors need to disburse their money fast" reasoning. In fact, when discussing with individuals in the development sector, I find this logic quite often. I might be ignorant or lacking experience; but I observe this as a generalized truth broadly accepted in the development

sector. I suggest that there is time to go a step further, and start investigating "the other side" in order to deconstruct this vision (or validate the truth and prove my ignorance). One way could be to apply the 5-why approach under Problem Driven Iterative Adaptation in order to find new answers. Another option may be to accept the constraints that donors impose, and rather focus on creative solution to the limitations – is it possible to be accountable to your taxpayers while being politically smart or adaptive?

Chapter 7. Conclusion

This chapter will summarize the findings and conclude on questions posed in the introduction.

In the first analysis, I established a connection between TDR and DDD by observing TDR as an element in the chain of equivalent elements seeking to give meaning to DDD. By focusing on collaboration surrounding a societal or complex problem, TDR is not based on predefined solutions, and could therefore be equivalent to elements in the DDD discourse. I therefore conclude that TDR is related to DDD as a way of producing solutions through collaboration with local stakeholders.

In the second analytical section, I found that the objectives of TDR were applied in an adaptive, flexible way in Enkanini. By building relationships and trust, the researchers where able to identify locally defined problems, produce a solution and test it. In order to scale up the implementation, they received funding, which in turn changed the project from a TDR project to a social enterprise. This transformation also included a new set of stakeholders and the intervention was adapted along the way.

In the discussion, I have argued that by focusing on local problems, by collaborating with local conveners, by testing and adapting to what works, by making small bets, depoliticising by adopting a market approach – the case study illustrates that a project implemented based on a transdisciplinary approach, simultaneously applied the principles under the DDD-manifesto.

I therefore conclude that TDR can be a way to implement the DDD-principles, but that how it is done is open for interpretation. In a world filled with complexity, the world does not only require complex solutions but collaboration and partnerships. TDR and DDD can be a way to ensure that.

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Appendixes:

Appendix 1: Documents reviewed in order to identify a DDD discourse

Andrews, M., Pritchett, L., & Woolcock, M. (2012) *Escaping Capability Traps through Problem-Driven Iterative Adaptation (PDIA).* Faculty Research Working Paper Series NO.299, Harvard Kennedy School.

This paper introduce the PDIA approach, which focus on solving locally defined problems in performance; creating an environment for decision making which allows for positive deviance and experimentation; rapid feedback loops that ensure experiential learning; and engages a broad set of agents to ensure that reforms are viable, legitimate, relevant and supportable.

Andrews, M., Pritchett, L., Samji, S. 6 Woolcock, M. (2015) *Building capability by delivering results: Putting Problem-Driven Iterative Adaptation (PDIA) principles into practice.* A governance practitioner´s notebook: alternative ideas and approaches. OECD 2015

This paper presents the PDIA approach in a six-stage "find and fit" iteration, starting with the construction of a locally felt problem and a clear idea of what the problem "solved" would look like.

Booth, D. (2013) *Facilitating development: an arm´s length approach to aid.* ODI, Politics & Governance Programme.

This paper present the concept of providing aid at arm´s length, with the purpose of facilitating difficult institutional change. He address the emergence of organisations that do in-country work not as funders of development, but as facilitators of change, which attract funding from official donors or charitable sources, but keep self-regulated to a certain degree. Further, the importance of external organisations in brokering solutions to problems of collective actions.

Booth, D: (2014) *Aiding institutional reform in developing countries. Lessons from the Philippines on what works, what doesn't and why.* Working politically in practice series, case study no.1. ODI

This paper presents two case studies from the Philippines, a reform to secure property rights and health tax. They where both politically smart and entrepreneurial.

Booth, D. (2016) *Politically smart support to economic development. DFID experiences.* Report, ODI.

This report illustrates two DFID funded initiatives (FOSTER in Nigeria and Centre for Inclusive Growth in Nepal) that implemented adaptive and flexible designs and thus allowing programme resources to be responsive to emerging opportunities as the political wind change. Trust and active oversight made can make a politically smart and working at arms length model work.

Booth, D. & Chambers, V. (2014) *The SAVI programme in Nigeria: Towards politically smart, locally led development.* ODI Discussion paper.

This paper presents the SAVI programme as a DDD case illustrating a politically smart, problem driven and locally led initiative. The key enabling conditions was that the donors, DFID, provided space

for an experience-based design process and permitted tangible results to be judged retro-perspectively and not pre-programmed.

Booth, D. & Unsworth, S. (2014) *Politically smart, locally led development.* ODI discussion paper.

This paper use seven case studies to illustrate that key to success included iterative problem solving, stepwise learning and brokering relationships to discover common interests. All cases reflect politically smart and locally led initiatives.

Booth, D., Harris, D. & Wild, L. (2016) *From political economy analysis to doing development differently. A learning experience.* ODI Report, January 2016.

This report provides insight into the problem of uptake of PEA, and as providers of PEA training, they take self-critique in the way PEA is introduced as a tool to donors and suggest DDD as a different way transforming development work.

Fisher, J. & Marquette, H. (2014) *Donors Doing Political Economy Analysis™: From Process to Product (and Back Again?).* International Development Department, University of Birmingham.

This paper provides a critical viewpoint on the donor-driven PEA analysis and the current PEA are not only donor driven, but also similar to intelligence gathering only with the intention of assessing risk or easy win opportunities.

Hima, J. & Santibanez, C. (2015) *Against The Current: How to Shape an Enabling Environment for Sustainable Water Service Delivery in Nigeria.* Global Delivery Intiative, April 2015

Part of the DDD case studies.

Hout, W. (2012) *The Anti-Politics of Development: donor agencies and the political economy of governance.* Third World Quarterly, Vol.33No.3: 405-422.

This paper reviews attempts to implement PEA in three donor institutions, and found that typically two patterns function as a constraint to a successful implementation; 1) development is seen primarily in technical terms and 2) the nature of incentives for development professionals leads them to resist the implementation of PEA.

Jones, H. & foreword by Booth, D. (2011) *Taking responsibility for complexity: how implementation can achieve results in the face of complex problems.*

This discussion paper present a tool to identify in what way and to what extent the problem we are facing, are complex.

Pellini, A. (2015) *A new era for development – the future or are we already there?* Blog post, available from: http://doingdevelopmentdifferently.com/a-new-era-for-development-the-future-or-already-reality/

Drawing on a presentation from Woolcock at the Interntaional Conference on Best Development Practices and Policies organised in Jakarta in August 2015, Pellini discuss the Development 2.0 era – where development have moved from technocratic reforms required to provide access to basic services, to reform of state capabilities to make the systems work. This shift requires a shift to a more multidisciplinary approach to research and multiple forms of evidence that can inform policy, it is an era where best practices struggle to succeed whereas context specific and politically feasible solutions are better fit for success.

Pellini, A. & Nixon, N. (2016) *Are partnership agreement the way forward for Doing Development Differently?* Blog post at the DDD community website.

By using the case of the Knowledge Sector Initiative in Indonesia, this paper present how partnership agreements offer ways for development practitioners to develop mutual accountability and trust, which in turn creates space for context-driven solutions, risk-taking and learning from failure.

Ramalingam, B. (2014) *Nagivating "wicked" problems in development.* Blog post, ODI, 18.September 2014.

This article provides an in-depth comparison between wicked and tame problems.

Tilley, H., Hadley, S., Long, C. & Clarke, J. (2015) *Sustaining public sector capability in developing countries. Review of the literature.* ODI, working paper.

This paper reviews the existing literature on public sector capability and by reviewing 34 cases from Asia, Africa and Europe, they find that improvement in capability are most likely to happen where there is high drive for reform from both the political leadership and the bureaucracy, within an institutional environment that provides supporting incentives. However, political support is needed to sustain the capability over time, and this support cannot be created by external actors.

Tilley, H.(2013) *Unblocking results. Case study. Rural water in Tanzania.* ODI.

This paper explores how the Netherlands Development Organisation has strengthened the capacity of local councillors to addressing the constraints to villager´s access to water. The approach addressed local and national levels, worked with staff at different levels, and took a long term approach enabling reflection and adjustement

Tulloch, O.(2015) *What does adaptive programming mean in the health sector?* Briefing paper, ODI.

This paper apply concepts from the health sector (quality improvement) to illustrate the potential of adaptive programming. QI is iterative, flexible and adaptive, and even though used

successfully, there is limited experience and evidence of how embed it within national structures and systems.

Valters, C., Cummings, C. & Nixon, H. (2016) *Putting learning at the centre: Adaptive development programming in practice.* ODI Report.

This report seek to make it clear why and how learning needs to be at the centre of adaptive development programming.

White, S. (2016) *Resisting the formulaic: measuring the impact of aid on entrepreneurship and development.* Blog post, available from http://doingdevelopmentdifferently.com/resisting-the-formulaic-measuring-the-impact-of-aid-on-entrepreneurship-and-development/

This post address the innovation that is happening in how entrepreneurship and private sector development is promoted in developing countries. He suggest that for the programs to succeed in reaching for instance the SDGs, they need to focus on locally defined problems, be flexible and adaptive, monitor effects carefully and adjust to unexpected changes. Further he emphasise the need to focus on how to measure and improve the performance of these kind of programs.

Wild, L. et.al. (2015) *Adapting development. Improving services to the poor.* ODI report, February 2015.

This report use comparable data to illustrate that while the MDGs has succeeded in some areas, other initiatives under MDGs has failed or even led to more inequality. They suggest that "more of the same" will not be enough, and present DDD as an alternative approach.

Williamson, T. (2015) *Change in challenging contexts. How does it happen?* ODI Report, September 2015.

This report is part of a lesson-learning series produced by ODI´s Budget Strengthening Initiative. With a focus in support to fragile and conflict-affected states, William suggest that actions that lead to change tend to be not pre-defined, but rather responses to local problems and opportunities; that solutiosn has to be addressing and adapted to local problems; and that reform is often driven by middle-level mangers who work with teams and coalitions.

Yanguas, P. (2015) *The challenges of managing development differently.* Effective States and Inclusive Development, 8.April 2015. (internet) available from: http://www.effective-states.org/the-challenges-of-managing-development-differently/

This blog post is written after participating in an ODI event discussing whether DDD can in fact be managed by development organisations. Yanguas questions where the money would go and whether DDD require both an effective public sector and political will in the receiving country. Further, he address how DDD are more and less demanding than conventional practice, how change entails working at different levels with both ministers at the top and individuals at the bottom and coordinate the

efforts, that institutional barriers may be easier for indiciduals and smaller organisations to overcome than bilateral donor agencies.

Appendix 2: Bibliography Transdisciplinarity

Bernstein, J.H. (2015) *Transdisciplinarity: A Review of Its Origins, Development, and Current Issues.* Journal of Research Practice, Vol.11:1 2015. (Internet) Available from: http://jrp.icaap.org/index.php/jrp/article/view/510/412

This paper provides an insight into the TD optimistic origin in the 1970s, to the emergence of two schools of thoughts in the 1990s; the Nicolescuan and the Zurich school. It address that TD has grown into more than a critique of disciplinarity and has gained recognition as a mode of research applied to real world problems that need not only to be understood in new ways but also demand practical solutions.

Cherney, A. (2013) *Academic-industry collaborations and knowledge co-production in the social sciences.* Journal of Sociology 2015, Vol. 51(4): 1003-1016. Sage Publications

This article highlights the coproduction of knowledge between academia and industry by data drawn from interviewing academic investors and industry partner representatives involved in the Australian Research Council. The article supports the perception that trust plays a crucial role in generating and sustain synergies between academic researchers and policy-makers and practitioners, and finds that this trust comes from an on-going relationship which can be challenging for both sides to maintain. The challenges are related to knowledge translation activities.

Gibbons, M (2000) *Mode 2 society and the emergence of context-sensitive science.* In Science and Public Policy, Vol.22, NO.3: 159-163). (Internet) available from: http://spp.oxfordjournals.org.esc-web.lib.cbs.dk/content/27/3/159.full.pdf+html

In this article, Gibbons draws on the work on Mode 2 knowledge production and suggest that both science and society has become more open, interactive systems.

Guston, D.H (2001) *Boundary Organisations in Environmental Policy and Science: An Introduction.* Science, Technology & Human Values, Vol.26, No.4: 399-408. Sage Publications

This article discuss boundary objects and organisations, hybrid management, standardised packages, coproduction of knowledge. It concludes that both the politicalisation of science and the scientization of politics undoubtedly are slippery slopes, but the boundary organisation avoids falling down either slope – as it co-produce mutual interests. Relevant to understand how TD could function as a boundary object between science, society, and technology.

Hall, K.L. et.al. (2008) *The Collaboration Readinss of Transdisciplinary Research Teams and Centers. Findings from the National Cancer Institutes´s TREC Year-One Evaluations Study.* American Journal of Preventive Medicine, 35 (2S). Elsevier Inc.

This study focus on the development of new tools for assessing the readiness for collaboration amongst health scientists at the first year of a large, multicenter initiative intended to foster collaborative research and training, which ultimately results in public health improvement. It provides evidence of collaboration across disciplines and reveal opportunities for enhancing this during the next phases.

Hall, K.L., Vogel, A.L, Stipelman, B.A., Stokols, D., Morgan, G. & Ghlert, S. (2012) *A four-phase model of transdisciplinary team-based research: goals, team processes and strategies.* In: Translational Behavioural Medicine Vol.2, No.4: 415-430. (internet) available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3589144/

This paper propose a TD model of four phases; development (convening a group of potential collaborators to define the scientific and societal problem of interest), conceptualization (collaborative teamwork to develop RQ and hypotheses, a conceptual model, research design), implementation (execution of the planned research) and translation (moving the TDR findings from one level of analysis to another and across the discovery-development-delivery continuum in order to create innovative strategies for resolving or ameliorating societal problems). They also identify key scientific goals and team processes that occur in each phase and across phases, and real life examples to meet the goals.

Hardy, M. & Jobling, H. (2015) *Beyond power/knowledge - developing a framework for understanding knowledge "flow" in international social work.* European Journal of Social Work, 18:4, 525-542.

Based on Foucault´s concepts of knowledge and power, they advocate an adaptive and flexible methodological framework which constitutes knowledge as local, situated and embedded, dynamic, interactive and flowing between actors, institutions and jurisdictions at an international level. They apply the model to examine how policy knowledge has informed the development of a particular approach to social work practice, supervised community treatment in mental health.

Harris, F. (2014) *Transdisciplinary environmental research: a review of approaches to knowledge co-production.* Nexus Network Think Piece Series, Paper 002. ESRC (Economic and Social Research Council)

Harris, F. & Lyon, F. (2013) *Transdisciplinary environmental research: Building trust across professional cultures.* In Environmental Science and Policy 31: 109-119. Online access through Copenhagen Business School Library

This paper contributes to the knowledge about building trust in research collaborations such as inter- and transdisciplinarity. As there are certain risks involved in collaborating, there is a need for trust: in the other collaborators - their reputation, expertise etc, and a need for sanctions in the form of formal contracts or agreements, or other informal norms. By 10 case studies, this paper illustrates the process of building trust - either on existing relationships, with the use of intermediaries or throughout the project. It also shows that there is a tension between short and long term collaboration and bidding for short term research.

Hirsh Hadorn, G. (): *Unity of Knowledge (in Transdisciplinary Research for Sustainability – Volume 1.*

In chapter 5, Hirsh Hadorn concludes that TD is neither universal knowledge or the solution to solve complexity problems, it is not suitable for every circumstance, neither easily transferable from context to context. There is no unique methodology. He suggest the need to rethink education, cross boundaries, cultivating a TD attitude.

Jahn, T. (2008) *Transdisciplinarity in the Practise of Research.* In: Matthias Bergmann/Engelbert Schramm (2008): Transdisziplinare Forschung. Integrative Forschungsprozesse verstehen und bewerten. Frankfurt/New York: Campus Verlag

Jahn provides a problem-oriented focus on TDR. The translation of a problem from its meaning in an everyday context into a scientifically valid research question means defining the goals of research in such a way that their contribution to practical solutions of a societal problem is narrow enough to be useful.

The article say there are three modes of access to a problem situation, either oriented towards everyday life, science or an integrative mode of access. In inter-and transdisciplinary research, there are certain integration problems, which Jahn distinguish into dimensions of; knowledge; social and organisational; communicative and; material or technical.

Jantsch, E. (1970) *Inter- and Transdisciplinarity University: a systems approach to education and innovation.* Elsevier Publishing Company, Amsterdam (Online access via Copenhagen Business School Library)

Erich Jantsch is said to be one of the first to use the word "transdisciplinary". With an origin in systems thinking, this paper introduces inter- and transdisciplinarity in education and innovation and separates the different disciplinary approaches based on their level of cooperation – ie. multidisciplinarity has no cooperation, while transdisciplinarity includes multi-level cooperation of the entire education or innovation system.

Klein, J.T. (2013): *The Transdisciplinary Moment(um).* Integral Review, Vol.9, No.2, June 2013. (Internet) available from: http://www.integral-review.org/issues/vol_9_no_2_klein_the_transdiciplinary_moment(um).pdf

This articles offers insights into the key words used to describe and define TD. The key words are organised in 5 clusters: 1) From disciplinarity to interdisciplinarity with the key words: integration, synthesis, interaction, holistic thinking, boundary crossing, transcendence. 2) From unity to complexity with the keywords; complexity, uncertainty, diversity, non-linerarity, emergence, heterogeneity, hybridity, coherence, interplay, interdependence. 3) Participation and collaboration: cooperation, partnering, networking, mutual learning, postnormal science. 4) Forms of knowledge: system, target and transformation knowledge, socially robust knowledge, contextualisation, co-production, science in society, indigenous, traditional knowledge. 5) transgressive imperative: interrogation, critique, transformation, reconfiguring, reformulating.

Krishnan, A. (2009) *What are Academic Disciplines? Some observations on the Disciplinarity vs. Interdisciplinarity debate.* ESRC National Centre for Research Method, Working Paper Series 03/09

As the focus on interdisciplinarity is increased, this paper seeks to define disciplinarity and illustrate its challenges through the lenses of philosophy, anthropology, sociology, history, management and education. Good to define a discipline

Lang, D.J et.al (2012) *Transdisciplinarity research in sustainability science: practice, principles and challenges.* Sustain Sci 7: 25-43

Looking at challenges and coping strategies in TD sustainability projects. Suggest a three phased typical model for a TDR process; 1) team building and problem framing; 2)co-production of solution-oriented knowledge and; 3 (re)-integration and application of produced knowledge. Also offers insight into the different challenges that may emerge in each phase.

Max-Neef, M.A. (2004) *Foundations of transdisciplinarity*. In: Ecological Economies 53:5-16.Elsevier B.V.

This paper introduce two kinds of TD: the weak (referring to Jantsch 1970 level of coordination between hierarchical levels, more applicable and systematic) and; the strong (based on Nicolescus levels of reality, the principle of the included middle and complexity).

Maasen, S., Lengwiler, M. & Guggenheim, M. (2006) *Practises of transdisciplinary research: close(r) encounters of science and society.* In: Science and Public Policy, Vol.33, No 6:394-398

The articles collected in this special issue cover both inter- and transdisciplinary research projects or programs. Based on empirical research, they provide an overview of a range of projects pursued in this new mode of knowledge production and ask what the specific features of these projects really are.

Michel, C., Hearn, S., Wurst, G. & Breu, T. (2013) *Maximising the Impact of Transdisciplinary Research with a Novel Approach: ROMA (RAPID Outcome Mapping)*. In: Maximising the Impact of Research: The NCCR North-South Approach. Fourth NCCR North-South Report on Effectiveness, by Michel, C., Heim, E.M., Zimmermann, A.B., Herweg, K. and Breu, T. NCCR North-South Dialogue, no.48 2013

Case study of research projects in Bolivia, Tanzania, Chad, Nepal, Pakistan and Tajikstan. Illustrating how ROMA can be a useful tool to influencing policy and practise, as well as tracking outcomes (17). ROMA contributes to the goal of TDR in particular in the phases of strategic planning of impacts and monitoring of and learning from impacts, however tensions between the TD approach and ROMA could occur as the main goal of ROMA is impact, where impact is only one of the many goals sought after from TD; TD is based on coproduction with stakeholders, whereas ROMA seek to change the behaviour of stakeholders.

Muhar, A., Visser, J. & van Breda, J. (2013) *Experiences from establishing structured inter- and transdisciplinary doctoral programs in sustainability: a comparison of two cases in South Africa and Austria.* Journal of Cleaner Production 61 (2013): 122-129. Elsevier Ltd.

This article describe the challenges of inegrating TD and ID into doctoral studies by using two cases studies from South Africa and Austria.One significant challenge when presenting the research findings is not only which scientific journal to publish in, but rather how to communicate with the local community and the general public. In both cases this was done through local newspapers, brochures, presentation to local authorities and other, however this is time consuming compared to a scientific publication. Further, they identified critical aspect for success; support from the university management, safeguard of long-term funding, development of appropriate supervisory capacity and integration into existing acdemic structures and administrative processes.

Nicolescu, B. (2014) *Methodology of Transdisciplinarity.* In: World Futures, The Journal of New Paradigm Research.

This article offers a philosophical insight into TD and propose a methodology (from Nicolescu 1996) based on 1) the ontological axiom – levels of reality, 2) the logical axiom – the included middle, and 3) the epistemological axiom – the universal interdependence.

Nowotny, H. (2004) *The Potential of Transdisciplinarity.* The European Research Council, available from: http://www.helga-nowotny.eu/downloads/helga_nowotny_b59.pdf

This brief reintroduces the Mode 2 knowledge production (from Gibbons et.al 1994). Obstacles to TD are related to quality (and patience). In Mode 2 the quality of knowledge is measured not only on scientific excellence, but also by incorporating societal value to the definition of good science – Nowotny argues that TD´s potential lies here; by producing better outcomes and science.

Nowotny, H., Scott, P. & Gibbons,M. (2003) *Introduction: Mode 2 Revisited: The New Production of Knowledge.* In: Minerva 41:179-194. Kluwer Academic Publishers.

The authors of Mode 2 Knowledge production answer to some of the critique nine years later of the introduction, seeking to contribute to the continuously debate about the future of knowledge production.

Pielke, R.A.Jr.(2004) *When scientists politicize science: making sense of controversy over The Sceptical Environmentalist.* Environmental Science and Policy 7: 405-417, Elsevier

By looking at Bjorn Lomborg "The Sceptical Environmentalist", Pielke illustrates how scientists use science to create political debate, and that this becomes problematic when scientific and political argumentation becomes equal. Knowledge in politics and knowledge in policy.

Pohl, C. (2007) *From Science to Policy through transdisciplinarity research.* Environmental Science and policy 11(2008) 46-53. Internet

By using projects from the Swiss Priority Program Environment and the Swedish Foundation for Strategic Environmental Research, Pohl illustrates how a list of projects are based on two different understandings of TDR and deal with the four different policy cultures differently. He concludes that when TDR is re-organising knowledge, it is more appropriate way of bridging science and politics.

Pohl, C., Rist, S., Zimmerman, A., Fry, P., Gurung, G.S., Schneider, F., Speranza, C.I., Kiteme, B., Boillat, S., Serrano, E., Hadorn, G.H. and Wiesmann, U. (2010) *Researchers role in knowledge co-production: experience from sustainability research in Kenya, Switzerland, Bolivia and Nepal.* Science and Public Policy 37(4) pages 267-281

This paper explore interactive knowledge production (either as boundary organisations or mode 2 knowledge production / transdisciplinarity) and researcher's challenges in dealing with a divided identity. With case studies, they illustrate how the researchers dealt with challenges related to power, sustainability and integration. In most of the cases, the researchers role were as a facilitators, intermediators and reflective.

Pohl, C. (2011) *What is progress in transdisciplinary research?* In: Futures 43: 618-626. Elsevier Ltd.

Relevant in this paper, is the introduction of how different thought styles has an impact on the td process. Going back to Fleck in the in the first half of the last century, who framed knowledge as a collective process of historically and socially embedded thought-collectives, stating that the ability to distinguish between seeing and knowing, belongs to a thought collective rather than the individual (621). Integration of different thought-styles is the main challenge for TDR, and this paper offers an insight to the different types of progress that can results from a TDR process; either connected to the issue itself or the TDR process.

Schols, R. & Steiner, G. (2015) *The real type and ideal type of transdisciplinary process: part II - what constraints and obstacles do we meet in practice?* In: Sustainability Science Vol 10. pp: 653-671.

This paper reviews 41 studies made on TD, illustrating the main constraints of transdisciplinary research - related to context, readiness to engage in TDR, problem framing and team building, project planning, organisation and resources, stakeholder engagement, developing a common language, selecting methods, outcomes and evaluations.

Scholz, R.W., Lang, D.J., Wiek, A., Walter, A.I and Stauffacher, M. (2006): *Transdisciplinary case studies as a means of sustainability learning. Historical framework and theory*. International Journal of Sustainability in Higher Education, Vol.7, No.3. Emerald Group Publishing Limited.

This paper reveal the historical roots of case studies, TD and sustainable development as teaching and research paradigms. TD case study (TCS) was developed and elaborated at the Swiss Federal Institute of Technology (ETH) as a methodology for TDR in environmental sustainability.

Serghie, D. (2013) *Context in collaborative structures - transdisciplinarity. A different viewpoint.* In: Network Intelligence Studies, Vol.1:2, 2013.

This paper looks at TD as a form of innovation which is materialized by combining the solutions offered by different stages of knowledge in various industries, due to the formation of collaborative structures that exceed the boundaries between industries. Further he suggest that potential managers of TD knowledge networks are catalysts, individuals with average knowledge but personals skills to connect people.

Stauffacher, M., Flueler, T., Krutli, P., and Scholz, R. (2008): *Analytic and Dynamic Approach to Collaboration: A Transdisciplinary Case Study on Sustainable Landscape Development in a Swiss Prealpine Region.* Syst Pract Action Res 21:409-422.

This paper offer a framework for collaboration. The dynamic, adaptive nature and a mix of analytical methods are illustrated in a TDR case study. Emphasise the need for institutionales collaboration, here in a steering group, advisory board and four reference groups.

Stokols, D. (2006) *Toward a Science of Transdisciplinary Action Research.* American Journal of Community Psychology, 2006, 38:63-77.

This paper offer a conceptual framework for establishing a science of TD action research. Building on Lewin´s (1951) concept of action research, three types of collaboration and the contextual circumstances that facilitate or hinder them are examined; 1) collaboration among scholars from different disciplines, 2) collaboration among researchers from multiple fields and practitioners from diverse professions and lay perspectives; and 3) collaboration among community organisations across local, state, national and international levels.

Stokols, D. (2010) *Training the Next Generation of Transdisciplinarians.* Plenary paper presented at the NSF-University of Idaho Conference on "Enhancing Communication in Cross-Disciplinary Research", September 30- October 2, 2010.

This paper address the developmental phases and core attitudes, beliefs, values, cognitive skills and behaviours underlying the cultivation of a scholar´s TD orientation.

Swilling, M. (2013): *Rethinking the science-policy interface in South Africa: Experiments in knowledge co-production.* South Africa Journal of Science 2014:110(5/6). (Internet) available from: http://markswilling.co.za/wp-content/uploads/2015/09/SwillingSAJS.pdf

This research article contributes to the discussion about the interface between science and policy. By referring to three South African case studied, characterised by practical involvement by researchers in change processes, he concludes that both the reflexive approach and TD have merit and can improve one another. He suggest that TD can benefit from some reflexive caution about the change agent roles of researchers. The cases illustrate the importance for researchers to actively engage in policy processes to achieve particular outcomes. Researchers should not presume TD only means a rewording of the traditional interdisciplinary approaches.

Wickson, F., Carew, A.L & Russel, A.W. (2006) *Transdisciplinary research: characteristics, quandaries and quality.* In Science Direct, Vol.38, Issue 9: 1046-1059.

> This article suggest that there can be no single TD research methodology as the TD research process does not lend itself to that. The process should rather be a context-informed reflection of the relevant problems and therefore needs to be more flexible and inclusive of multiple methodologies.This paper illustrate TD as a problem-focused approach. "The explicit intent to solve problems" is one of the three characteristics of TD

Wuelser, G., Pohl, C. & Hadorn, G.H. (2011) *Structuring complexity for tailoring research contributions to sustainable development: a framework.* Sustain Sci (2012) 7:81-93. (Online access via Copenhagen Business School Library)

> This paper focus on the way sustainable development is framed and investigated and how its crucial for how the research actually will affect SD. The authors proposes a conceptual framework based on three types of knowledge –systems /targets/transformation and 3 analytical perspectives constituting the framework: 1) sustainability objectives (the meaning of SD), 2) policy processes (how to achieve SD) and 3) knowledge required (the nature of knowledge SD requires).

Appendix 3: List of interviewees

Interviewees from academia		
DATE	NAME	AFFILIATION
02.March	Berry Wessels	TDR researcher, then project coordinator
09.March	Andreas Keller	TDR researcher, then operational manager and project manager
23.March	Vanessa van Der Heyde	TDR researcher, now employed by SI
21.April	John van Breda	Academic director TsamaHhub
Interviewees from non-academia		
16.March	Johru Robyn	Manager, Department of Informal Settlements at Stellenbosch University
24.March	Pseudonym	Project manager, local NGO, no longer involved
30.March	David Sheridan	Technical manager, no longer involved
31.March	Carlos Smith	Specialized Solar Systems
13.April	Damian Conway	Director and Manager iShack project

Appendix 4: Semi structured interview guide iShack

Introduction
• Introduce myself, the study and the research question, and the agenda for the interview. • Ask for consent to record, inform what it will be used for and ask whether he/she want to approve of quotes before I use them in the study.
The role of the interviewee
• Maybe you could you start by telling me about your role in the project? • When did you get involved and how? (E.g. through employment, personal network etc.) • What were your motivations or expectations when joining? Were the expectations met? • Who did you work with the most/closest? Did that change during the process? • Where was your workstation? E.g. Enkanini, SI or other • Did you have experience working in Enkanini before, or other informal settlements, or know any of the other people involved in the project? • Did you have experiences with a TDR process before? • Did your role evolve over time? If so, how? • Are you still involved today?
The process
• Depending on when the interviewee joined and their position. • iShack is built on a TDR project, integrating different kinds of knowledge during different stages. What kind of knowledge did you contribute with? How did you draw on your background in (personalised for the interviewee, e.g. consulting) the project? • At which stage in the process where you involved? • Where you involved in any of the following events: Building relationship in Enkanini Enumeration process Securing the subsidy from the government Establishment of the research centre Designing the business model/project plan

• What are your thoughts on going from a research project to a social enterprise? • Do you have any reflections on what was important for you as part of a TDR process?
Challenges
• What are you reflections on working in a context like Enkanini? • Did the political volatility in Enkanini impact your work, if so how and how did you deal with it? • TD literature say one of the main challenges with TD, is that integrating different forms of knowledge, may lead to conflict as people have different views – did you have any experiences with that in iShack? • What was most challenging for you in your role? • How did you cope with those challenges?
Lessons learned / Reflections
• What do you find as the main outcomes of the project? • What do you think are the main reasons for this? • How was your role important in that? • If you were to do a similar project in a similar situation, is there anything you would have done differently? – And what would you do the same?
Sum up, thank for the time and ask to follow up with questions if needed. Confirm that I will be sending quotes if wanted.

Appendix 5

Timeline for iShack

2006	First residents settle in Enkanini
2010	Department for Informal Settlement at Stellenbosch Municipality established
2010	A group of students at Stellenbosch University walks into Enkanini settlement and befriend Mama Yunes. They establish a NGO called serve the City, with the goal of connecting the residents of Enkanini with the surrounding middle-class and white communities through small improvement work.
2010	The National Research Council call for proposal for research on community engagement
2011	The TsamaHub at SU awarded with a R2.6 million research grant on community engagement based on transdisciplinary research.
2011	ISUG established of students at the Sustainability Institute.
Aug-Sept 2011	Design of iShack and retrofit
Oct. 2011	Construction of dwelling interventions
Jan.2012	Gates Foundation Proposal
Feb 2012	Enumeration general meeting
Jul.2012	iShack project established
Oct.2012	Enkanini stakeholder meeting
2013	Green Fund contributes R17 million
2013	Sustainability Institute Innovation Lab established, win the municipal tender for supply energy in Enkanini
May, 2013	Stellenbosch municipality indigent policy influenced to provide electricity for non-grid connected informal households
Sep.2013	Enkanini Research Centre established
April 2015	800 shacks electrified, approx.. 2500 residents access to clean, safe electricity in their homes