

Sustainable Agricultural Techniques and Performance Oriented Empowerment

An Actor-Network Theory Approach to CEDAC Agricultural
and Empowerment Programmes in Cambodia

by Hart Nadav Feuer

Thesis, Master of Philosophy
in Development Studies

Queen Elizabeth House
St Antony's College
University of Oxford

April, 2008

ACKNOWLEDGEMENTS

This thesis was made possible by the care, support and critical feedback of many people in Cambodia and England. I am most indebted to my advisor, Graham Brown, for putting clarity to my faults, and to my field assistant, Piseth Som, who was my best informant and great friend.

In Cambodia, I was cared for with the utmost generosity and hospitality by the senior staff of CEDAC, including Vuthy Bao, Seng Suon, Koma Yang Saing, Kimthan Yi and Thy Or. My gratitude goes to Koma and Seng for reviewing my final drafts and finding those errors that one else could. For hosting me warmly in Angtasaom and Vaspors Village, my thanks go to Sister Sokha, Mr Leak and Uncle Mom. For nursing me back into Cambodian life and always being the warmest friends, my heart goes to Sary Seng and his wife Pisey Meas. Special thanks to Ayako Hiwasa and Payal Rajpal, two good friends in Cambodia who provided me unsparingly with their companionship and perspectives. For putting up with my odd working hours in Phnom Penh, I thank the staff of the Center for Khmer Studies, especially Kethya Kheng, Philippe Peycamp and warmest housekeeper I know. Last but not least, my appreciation goes to the numerous field staff of Zone II for putting up with my constant presence and onerous questioning.

In England, my gratitude goes to Julie Taylor, who edited my messes, and in America, my family for making that last-minute edit.

Last but not least, my heartfelt appreciation goes to the Jack Kent Cooke Foundation for supporting me so comfortably and caringly through these past two years. May there be many more years to come!

ABSTRACT

Presently, there is strong evidence to support the position that development strategies focussing on sustainable agriculture, especially low external input cultivation, are rapidly increasing in influence. Investigating the dialectic of the evolution in ideas and practices for sustainable agricultural development is important for an understanding of how and whether this new “shift” will affect poverty and development. Without risky and poorly-understood investments in agrochemical inputs, many poor Cambodian farmers have been able to achieve increased yields over 100% whilst reducing water consumption by employing the System of Rice Intensification (SRI). The promotion of SRI, and its corollary sustainable initiatives, have been hailed as a major success and have seen full integration into national development schemes and international NGO work. Such technology or technique-oriented development programmes often expand into local organising, empowerment and private sector practice. This progression often involves increasingly strict normative prescriptions about how society should be transformed and how this promotes sustainability. Definitions of sustainability, however, tend to be fluid and are thus easily adaptable to new contexts, and easily appropriated to justify various measures. This thesis explores the pathways through which sustainable agricultural programming has transgressed the boundaries of strict ecological sustainability by highlighting the tensions and advantages of the evolving NGO-model of extension, participatory development practice, and socially responsible enterprise. By exploring the agricultural livelihoods of involved Cambodian farmers empirically, and in ethnographic detail, and by analysing the concomitant evolution of organisational discourse and practice, I will show how an initial focus on technical agricultural improvement and poverty-reduction has transformed into grand plans for widespread sustainable enterprise promotion in Cambodia. This has been marked by a shift in accountability that favours a passive, critical mass-based strategy for drawing in previously uninitiated farmers, rather than the grassroots-based micromanagement approach favoured since the inception of rural development programming. I argue that this is symptomatic of the larger convergence of promising sustainable agricultural initiatives upon the reformist, technocentrist and increasingly hegemonic ‘market sustainability’ or ‘developmentalist’ paradigm of sustainable development.

Table of Contents	1
List of Acronyms	2
1. Introduction	3
2. Livelihoods To Actor-Worlds: Situating Theories Of Sustainability And Rural Development	6
2.1. Actor-Network Theory	6
2.2. Sustainable Livelihoods Approach	8
2.3. Melding the Discourses of Sustainability and Agricultural Development	10
2.3.1. The Discourse of Sustainability	10
2.3.2. The Discourse of Agricultural Development	12
2.4. Non-Governmental Organisations: Brokers and Translators	16
2.4.1. The Cambodian Center for Study and Development in Agriculture	18
2.4.2. The System of Rice Intensification	20
2.5. Applied Actor-Network Theory	22
3. Encountering the Extension and Empowerment System	25
3.1. Historical Context of Agricultural Production in Cambodia	26
3.2. CEDAC Programming in Zone II	27
3.3. CEDAC's Typology of Farmers	32
3.3.1. The “pioneers”	32
3.3.2. The “wait-and-sees”	35
3.3.3. The “difficult group”	37
3.4. The “strategic agents”	39
3.5. Encountering the Farmer: Stereotypes, Sympathies and Frustrations	40
4. Results: Investigating Past and Future Narratives	44
4.1. The Current Situation, Looking Backward	44
4.1.1. Asset-based Livelihood Assessment	46
4.1.2. Scalar Valuation of Rice Cultivation Practices and Yield	47
4.1.3. Through the Figures: Accomplishment and Build-up	48
4.1.4. From Dynamic Action Research to Holy Pedestal: The Birth and Adolescence of SRI	53
4.1.5. Structural Constraints to the Adoption of SRI	54
4.1.6. Social Constraints to the adoption of SRI	64
4.1.7. Conclusion: How CEDAC arrived at its present state	70
4.2. The Current Situation: Looking Forward	71
5. Conclusions and Discussion	77
5.1. Prospects	82
Appendix 1 – Research Methods and Methodology	84
Appendix 2 – Rubrics and Factor Analysis Weights	100
Appendix 3 – Secondary Statistical Results	101
Appendix 4 – Occupations Listed by Salary Classification	102
Appendix 5 – Interview List	103
Bibliography	104

List of Acronyms

CBA	Community-Based Animator
CBO	Community-Based Organisation
CEDAC	Centre d'Étude et de Développement Agricole Cambodgien; Cambodian Center for Study and Development in Agriculture
CIIFAD	Cornell International Institute for Food, Agriculture, and Development
FA	Farmers Association
FCS	Farmer Community School
NAPMP	Natural Agri-Product Marketing Program
FSR	Farming Systems Research
GRET	Group for Research and Exchange of Technology
IAK	Indigenous Agricultural Knowledge
IF	Interested Farmer
IRRI	International Rice Research Institute
ITK	Indigenous Technical Knowledge
LEISA	Low External Input and Sustainable Agriculture
MAFF	Ministry of Agriculture, Forestry and Fisheries (Government of Cambodia)
MPF	Multi-Purpose Farm
NGO	Non-Governmental Organization
PAR	Participatory Action Research
PRA	Participatory Rural Appraisal
SID	System of Intensification and Diversification
SRI	System of Rice Intensification
TOT	Transfer of Technology
VBA	Village-Based Animator

1.0 INTRODUCTION

In development discourse, the concept of sustainability has grown to encompass a wide range of ideas and practices, ranging from specific methods for improving eco-efficiency to broad theories concerning how to (re)structure consumer society (Jacobs, 1999; Lélé, 1991; O'Riordan, 1981, 1989; O'Riordan & Voisey, 1997; Tripp, 2006; UNCED, 1992a: Section II, 1992b). In this thesis, I follow Jacobs's (1999: 281, note 217) view that sustainability has achieved 'buzz word' status; it is employed broadly in a cavalier manner and has thus escaped definition. In practice, sustainability is operationalised by each user, often in a non-linear, ecological process of long-term planning mediated by short-term problem solving (Judge, 1990). In the short-term, sustainability is often provisionally defined as a point of reference, such as sustainable rice production, which then implies the application of various agroecological techniques for improving production. Promoters of these techniques, such as development NGOs, eventually recognise that agricultural techniques are of limited use unless broader market and societal configurations are brought into alignment with production realities. Thus, engaging with short-term issues breeds a longer-term—and broader—view. For the long-term, it becomes clear that the path towards a sustainable outcome (e.g., sustainable consumer society, sustainable industry, sustainable agriculture, etc.) involves comprehensive engagement with society and markets. In this thesis, I critically examine how rural livelihoods are affected by this ad-hoc (re)configuration of idea and practice of sustainability through studying the past and future programming of the Cambodian Center for Study and Development in Agriculture (CEDAC).¹ The question to begin this analysis is: what are the implications for beneficiaries and NGOs of continuously redefining sustainability to suit new social realities, given the increasing dominance of market-based frameworks in civil society?

¹ This is a French acronym, the original of which is Centre d'Étude et de Développement Agricole Cambodgien.

This thesis explores how and why sustainable agricultural programming has expanded beyond the boundaries of strict ecological sustainability and made compromises with the capitalist world system. It highlights the tensions and advantages of the evolving NGO-model of socially responsible enterprise adopted over time by CEDAC. In particular, I show how an initial focus on the improvement in rice-based agricultural livelihoods has transformed into an imperative for building broad market-based framework for the promotion of sustainable agriculture in Cambodia. Improving rural livelihoods has thus become a by-product of system expansion rather than a purposeful activity unto itself. This has been marked by a shift in accountability that favours a passive, market demand-pull-based strategy for drawing in previously uninitiated farmers, rather than the grassroots approach favoured since the inception of rural development programming. I argue that this shift is symptomatic of the larger convergence of promising sustainable agricultural initiatives upon the reformist, technocentrist and increasingly hegemonic ‘market sustainability’ paradigm of sustainable development (SustainAbility, 2003). This state of affairs concurrently provides immense potential for displacing traditional industrialist modes of agricultural development, but also makes it increasingly vulnerable to cooptation by them (Jacobs, 1999: 281).

The primary approach taken for defining the domain of study is the ‘sustainable livelihoods’ framework, which outlines how rural livelihoods, and which vectors of social and ecological sustainability should be studied. The primary theoretical grounding derives from actor-network theory, which sees the evolving activities and goals of sustainable agricultural development as the product of self-reaffirming ‘*translation*’ (i.e., network building) on the part of NGOs, local organisations, academics, and professionals. In order to begin making sense of the arena in which this practical and discursive battle is being waged, I directly introduce the theoretical framework in Chapter 2 and outline how it is used to illuminate the concepts of sustainability, agricultural development as well as the conceptual space of non-governmental organisations. Chapter 3 describes the Cambodian context within

which this discussion will take place and the institutional background of this case study. In Chapter 4, I present statistical and ethnographic evidence for the institutional shift towards a performance orientation and its implications for accountability. In Chapter 5, I conclude.

2.0 LIVELIHOODS TO ACTOR-WORLDS: SITUATING THEORIES OF SUSTAINABILITY AND RURAL DEVELOPMENT

This study focuses on two relatively discrete subjects—farmer families and institutions—and how they are bound together in a chain of relational macro-micro interactions that form a particular representation of the macro-social space of sustainable development (Knorr-Cetina, 1981). I explore how one NGO melds together the discourses of sustainability and agricultural development to construct its own proprietary definition of sustainable development (Latour, 1987). In particular, I focus on how various ‘technologies of knowledge’—such as the System of Rice Intensification (SRI), group formation and social enterprise—have been employed instrumentally by CEDAC in order to enrol farmer-participants into its practical model of sustainable development. This thesis draws on actor-network theory to illuminate the processes of enrolment and network expansion and to reconcile the macro-micro levels of analysis in this case. As a discursive tool for understanding the conceptual lens from which CEDAC views rural communities, I use a qualified form of CEDAC’s own ‘Sustainable Livelihoods Approach’ (SLA).

2.1 Actor-Network Theory

Developed in diffuse fashion from the late 1970’s by sociologists Bruno Latour, Michel Callon and John Law, actor-network theory (ANT) primarily evolved as a reply to the theoretical limitations confronting sociological scholarship on the interaction between science, technology and society. Although ANT was initially employed as a theoretical and methodological frame for untangling the messy relationship between the hard sciences and their social embeddedness (Callon, 1980, 1986b; Callon & Latour, 1981; Latour, 1987,

1988), it has increasingly been used to analyse institutional behaviour, the sociotechnical nature of ‘projects’ parented by organisations and the non-human objects and technologies which mediate group functioning (Callon, 1991; Latour, 2004, 2005). Frequently misunderstood or oversimplified as another framework for analysing ‘social networks’ and ‘agency’ (Latour, 2 May 1997), ANT is actually something of a non-framework, in that it favours a methodological toolkit that champions heterogeneity of actors (or *actants*) (Callon, 1986a: 19), open uncertainty about selection and constant dislocation (or churn) rather than static states (cf. Callon, 1986a: 27-28; Latour, 2005: 11-12, 59-60). ANT is a particular appropriate theoretical framework due to the diverse nature of CEDAC initiatives and stakeholders, the organisation’s embeddedness within larger discourses of sustainable agriculture and rural development, and the presence of non-human technological elements such as SRI.

Central to the understanding of ANT is the concept of ‘translation’, which is a manner of imposed collaboration by which actors enrol others into, or maintain their presence in, an ‘actor-world’. Actor-worlds, which are often conflated with ‘social networks’, are operational spaces within which actors continually renegotiate their roles and redefine their functionality. Aggregate acts of translation maintain the coherence of the actor-world and recruit new support. This is done in a number of ways. *Interessement*, one form of translation, is the act of using enrolment to interest an actor by engaging in *indirect* incentivising. Another form of translation is the strategy of rendering involvement in the actor-world indispensable by creating a “geography of obligatory passage points” (Callon, 1986a: 26-27), through which recruits traverse without necessarily comprehending their contribution to the overall functioning of the actor-world. This form of translation relates to another form, namely *Problematisation*, which involves the dismemberment of a larger problem into small bits that are manageable, but at the same time give the impression of being critical to the ultimate (re)solution of the larger ‘problem’. The last type of translation

I will discuss is *displacement*—a set of roles and activities that keep members “busy”, and which tend to breed new activities that distance the actor from the implications of the ‘matter of concern’. Displacement is similar to the idea of institutionalisation commonly found in organisational ethnography literature.

The result of aggregate translation exercises of *actants* is to maintain the coherence of an actor-world. An *actor-network*, in contrast, is not an object, but a concept used to describe collective translation (Latour, 2005: 131). It is useful to compare actor-networks to social movements—both involve sprawling actor-worlds and actors (self-described and not) performing day-to-day activities that contribute to the identity and functionality of the social movement. The main differences are that there is a tendency to reify social movements (e.g., the human rights movement, the environmental movement) and crystallise their goals, whereas actor-networks are processual and conceptual. In this study, sustainable agriculture and rural development are conceptual spaces maintained by actor-networking, “under” which actor-worlds such as development NGOs, agricultural techniques, government and village-based organisations are engaged in a self-reinforcing process of translation. Throughout this thesis, I will italicise words related to actor-network theory if the reference is ambiguous.

2.2 Sustainable Livelihoods Approach

The sustainable livelihoods approach, originating in the work of Robert Chambers and Gordon Conway (1992) at the Institute for Development Studies, is a largely institutionalised format for rural appraisal. Once the flagship appraisal tool for the UK Department of International Development (DfID), SLA has since declined in prominence (Batterbury, 24 January 2008), although it continues to be employed officially and informally by many agencies and local NGOs, including CEDAC. The approach is essentially a normative lens for viewing rural life, in which ‘livelihoods’ are comprised of the abilities, assets (including

both material and social) and activities required for a means of living. Livelihoods are considered ‘sustainable’ if they can cope with and recover from shocks, maintain or enhance their capabilities and assets, all the while not undermining the natural resource base on which they depend (cf. DfID, 2001). SLA, furthermore, is action-oriented insofar as its explicit goal is to provide a means of thinking about the objectives, scope and priorities of development, so as to enhance performance in poverty reduction. The primary areas of interest are the *contexts* (policy setting, history, agroecology, socio-economic conditions), including what combination of *livelihood resources* (human, physical, and social capital) result in the capability to follow various *livelihood strategies* (new cultivation practices, diversification, migration, etc.) and to what extent these strategies produce *sustainable outcomes* (Scoones, 1998). These areas of interest are generally operationalised in various indicators, as specific data gathering techniques and as strategies for presenting information in reports.

Because SLA has been institutionalised as an interdisciplinary lens for data gathering and interpretation by many development NGOs, it serves the academic researcher as a practical basis from which to analyse institutional activity, behaviour and discourse. It is not, however, a matter of adopting the same approach and cross-checking the results of NGO reports, but of *studying ‘through’ the framework of ‘sustainable livelihoods’ to critically understand the internal logic of institutions employing this approach*. However, this does not preclude the researcher from using aspects of the approach that are, amongst other things, intuitively appropriate for the subjects of research. Indeed, SLA has brought together a useful relational view of practices, forms of ‘capital’, and institutions that is useful for understanding agricultural change and intervention. However, SLA is not unconditionally suitable, and many of its normative elements and theoretical blind spots have been criticised (Meagher, 24 January 2008). In this thesis, I use the organising principles of SLA to examine issues of risk, vulnerability, adaptation, inclusion, and ecological sustainability. I also SLA

to explore, from a bottom-up perspective, how institutional processes (formal and informal) mediate or facilitate livelihood strategies and outcomes.

To prevent confusion, throughout this thesis I will refer to ‘livelihoods’ separately in its softer definitional form, whilst ‘sustainable livelihoods’ will refer more specifically to SLA.

2.3 Melding the Discourses of Sustainability and Agricultural Development

2.3.1 The Discourse of Sustainability

Contemporary theories of sustainability in agriculture are largely an emanation from the Global North, and in particular from the influences of environmentalism and post-industrialism and, later, neo-liberal economic discourse (Adams, 1990). The early paradigm of sustainability was largely normative in nature, emerging from post-industrialist atavistic notions about returning to nature, leading simpler lives and honouring rural farm heritage (cf. Leopold, 1981; White, 1967; Wilson, 1996). The collective *translation* of embedded actors such as animal rights activists, family and artisan farmers, discriminating consumers and concerned agronomists have radically increased environmental awareness and enrolled support for international health and environmental agreements (Singer, 1974). More recently, this paradigm has been appended and challenged, by scholarship taking an economic, or pragmatic, view of environment and social development (Freeman, 1998). This new cleavage in the definition of sustainable development has arrived with considerable tension, as it is a discrete shift away from the moralistic and normative notions of sustainability envisioned by post-industrialist authors. This new definition has either been seen as a reflective shift away from the narrow concerns of mainstream economics and modernisation (Friberg & Hettne, 1985), or as falling in line with neo-liberal economic development,

because it shares a similar foundational premise prioritising capital accumulation, competition, and efficiency (Adams, 1995; Aseniero, 1985; Haque, 1999). Between these cleavages in the discourse of sustainable development, many hybrid development models have emerged. Fairtrade is a recent manifestation of this more systemic, economicistic approach to dealing with rural agricultural livelihoods through the normative lens of sustainability. Global institutional discourse has echoed this new tension, materialising most significantly in the Kyoto Protocol's market-oriented Clean Development Mechanism. The non-profit sector, the primary subject of this thesis, has also been encouraged to partially adopt business plans and market-based structures (SustainAbility, 2003). These models are essentially competitive in nature, each *problematising* the model of development in ways that enable new incentives to be used to attract support and followers and provide new functional roles for them to fulfil.

These hybrid models are compromises of the post-industrialist view, made in order to compete with the reigning global paradigm of agriculture based on industrialisation, mechanisation and external inputs. The so-called Green Revolution was a modernist paradigm for rural and agricultural development that, with the best of intentions and experience from the industrialised North, refashioned agricultural practice in certain regions in the Global South (Fairbairn, 1995; Kaosa-ard & Rerkasem, 2000). Land consolidation, high-yielding varieties, and agricultural chemicals became *obligatory points of passage*, through which farmers in India and Indonesia were recruited to the Green Revolution actor-world. Whilst prescriptive criticism of green revolution measures existed very early on, only when declining yields, soil salination, the volatility of agricultural input prices and the long-term effects of social fragmentation became unmistakeable, did a serious revision of green revolution ideals begin (Fairbairn, 1995; Pingali et al., 1995). This revision has been hampered by institutional inertia and inflexible research methods, resistance from developed countries' agricultural sectors, and contradictory imperatives for short-term agricultural

productivity (ITK Study Group (IDS Workshop), 1989; Mvena et al., 1990: 57; Ngasongwa, 1990: 33). International seed peddlers, agrochemical companies, and national governments often penetrate rapidly into the most remote and marginal areas, pre-empting many attempts to envision and plan alternative agricultural production (M. Altieri, 1987; Bawden, 1991; Shiva, 1997, 2000; Uquillas, 1994). The proliferation of highly-capitalised external input-driven cultivation practices of developed countries, combined with the high rates of urbanisation experienced in the Global South have created a path dependence locking in this system of production that is not easily unravelled (Asia-Pacific Human Development Report, 2006; Brot für die Welt et al., 2002; Tiffen & Bunch, 2002). In order to face the hegemonic presence of the green revolution paradigm, sustainable development has increasingly moved towards a focus on market mechanisms, despite the fact that purist post-industrialist views are often the ideological underpinning. The discursive shift towards market-compatibility within sustainable development has been mirrored by a similar shift towards compromise within the agricultural research community.

2.3.2 *The Discourse of Agricultural Development*

At the intersection of sustainable agriculture and rural development lies agroecology, which is primarily the application of ecological principles to agricultural science. First formally introduced by Miguel Altieri (1987), agroecology has increasingly come to symbolise resistance (against the strict scientific rationality of agronomy) and cooptation (of scientific methods for ecological purposes). Although extant long before in the works of K.H.W. Klages (1928), the contemporary support for agroecology grew out of dissatisfaction with green revolution (high external-input) systems of cultivation and social organisation (Bebbington, 1994; Fernandes et al., 2002). As such, it is a science that is fairly reactionary in nature and often bundled with methodological considerations, such as local participation

and organising. In part, agroecologists seek not only to undo the damage wrought by industrialised cultivation practices and land management techniques, but also to foment a paradigm shift in rural development as a whole (Francis et al., 2003).

Agroecology has assembled itself theoretically and methodologically from many disparate fields. Firstly, agroecology is deeply rooted in the field of international development and most scholars lay out the challenges of food security and rural livelihoods as the premise on which agroecological principles are being developed. Secondly, agroecology is not seen as synonymous with sustainable agriculture for the simple reason that it is a scientific and scholarly corpus, not a grand theory. The purpose of this distinction is to allow agroecology to make collegiate inroads into the agricultural sciences by remaining research-oriented, whilst at the same time drawing out agricultural scientists into broader normative debates (cf. M. A. Altieri, 1995; Gliessman, 1998, 2006; Marten, 1986; Pretty, 2005; Uphoff, 2002c). Thirdly, agroecological terminology has appropriated many conceptual elements from economics in order to pre-empt its own marginalisation from the institutional world dominated by development economists. Fourthly, agroecology is diplomatically premised on reconciling populist views of rural development and those of the historical mainstream of agricultural research and extension (Kaosa-ard & Rerkasem, 2000: 11; Uphoff, 2002a: xv-xvi). And finally, participatory development practices have been internalised by agroecology in a manner commensurate with maintaining core scientific and research methodology. The field of agroecology has been successful with enrolment because it has combined the macro-concerns of scientific knowledge with the micro-concerns of development practitioners, farmers and ecologically oriented academics. Agroecology has effectively *displaced* practical space from many fields in order to generate its own dedicated actor-world, complete with journals, books, researchers, supporters and development interventions.

The development of agroecology as a counter-hegemonic discourse against modernist agricultural development has been complemented by the emergence of the populist (or *Farmer First*) school of rural development. *Farmer First* strategies for actor-networking are very similar to those of agroecology and their two actor-worlds overlap considerably in goal and practice. There is a shared view that the ‘transfer of technology’ methods by which industrial agriculture has traditionally been diffused misunderstands that agriculture is simultaneously an occupation and a livelihood (Bawden, 1991: 2363-2364; Chambers et al., 1989: xvii-xx). In the words of Paul Richards (1989), agriculture can be seen as a “performance” for which many objectives are conceived, such as balancing nutrition, earning pride, structuring the flow of the year, and, of course, producing a good yield. Thus, improving livelihoods and ameliorating poverty must cater to these various needs, in addition to improving raw output and productivity (Dlamini & Simelane, 1990). Populist scholars have argued for a shift away from the one-dimensional transfer of technology paradigm (Röling, 1994: 245) towards more participatory and people-oriented methods such as Farmer Systems Research, Farmer Participatory Research, and Participatory Action Research (Byerlee & Tripp, 1988; Cornwall et al., 1994; Haverkort et al., 1991; Norman & Collinson, 1986).

The *Farmer First* view of rural development was eventually revised and appended in a second gathering of scholars in an edited volume called *Beyond Farmer First*. Whilst *Farmer First* extols the resilience and efficacy of indigenous knowledge, *Beyond Farmer First* reflected new shifts in development thinking that focused more on the reflexive navigation of ‘power’ and agency in rural development (see Scoones & Thompson, 1994a: 21-23).² The *Farmer First* view saw peasants in the Global South as “situated agents”, who critically evaluate new cultivation practices and structures for rural social organisation, so as to ensure their contextual appropriateness. *Beyond Farmer First* authors argued that the

² Although not the only example of populist, farmer-oriented literature of its time, the book *Farmer First*, published in 1989, is widely seen as the central unit around which similar literature has clustered.

ability to critically assess the value of various agricultural techniques and inputs depends upon having the information, awareness and capability to do so (cf. Scoones & Thompson, 1994b). As Bebbington (1994) argues,

The emphasis on what knowers know about technology and ecology has diverted attention away from the myriad things they do not know about markets, politics and the machinations of a world beyond the farm gate that have long since pushed that gate open and irrecoverably influenced the farm's future. (p. 89)

The *Beyond Farmer First* view, however, assumes that rural people are quite insulated from the technical and political world around them and need to “learn” how to interact with it using the benefits of hindsight of Northern post-industrialist agriculturalists (Long & Villareal, 1994: 50-51).

Advocates of sustainable agriculture hope to see farmers generate fundamental and profound critiques of the dominant agro-industrial models of rural development. The structural dynamic underlying much of this notion is that the South, having begun agricultural industrialisation later, has a much larger cadre of peasants who are in a position to embark directly on the post-industrialist path to sustainable agricultural development. In short, in the name of food security, ecological diversity, environmental protection, and health, ecologically-oriented Northern observers hope that peasants in the Global South will “leapfrog” the unsustainable path taken by the industrialised North (Judie Thorpe, quoted in Elkington & Lee, 14 February 2006). This ethnocentric view is complemented to some degree by the view that farmers in the South stand to benefit from the adoption of post-industrialist ideals for production.

Although the theoretical benefits of shooting for post-industrial agricultural methods are well articulated, there is no correspondence between these benefits and a clear set of

sustainable development practices. Sustainable agricultural development, however defined, is often associated with opportunities to gain access to privileged markets such as Fairtrade and organic, improve eco-efficiency, reverse deleterious health effects of agricultural chemicals and gain control over sociocultural change (D'Souza & Gebremedhin, 1998). Also embedded within many contemporary programmes for sustainable rural development are expectations for heightened local cooperation, decentralised governance, and citizen empowerment (Pretty, 2005; World Bank, 2008). In contrast, the yield and productivity orientation of industrialised agriculture does not generally present these ‘fringe benefits’, and often demands a radical and disruptive restructuring of land tenure and cultivation practices. However, the ability to achieve all of the benefits associated with sustainable agricultural development is wholly dependent on which practices (or development strategies) are employed. Selecting a particular activity—such as natural resource mapping, interest group formation or ecological agriculture extension—effectively defines (and delimits) what comprises sustainable development (Desai, 2006: 175), at least until a new practice is adopted. Therefore, in order to achieve the most benefits of sustainable development, *more* practices corresponding to *more* benefits should be initiated. The problem that emerges from this “additive” nature of sustainable development is that new practices are not necessarily commensurate with existing practices. NGOs associated with the discourses of sustainability and agricultural development are often the first to experiment with different formulations of practices for sustainable development.

2.4 Non-Governmental Organisations: Brokers and Translators

Although NGOs³ are often some of the first to adopt certain vanguard models of development practice, they often assemble themselves into an actor-world that brings

³ I will focus on NGOs that fall into the same category as CEDAC, which is a national-level, donor-funded NGO comprised mostly of middle-class nationals with a professional or quasi-professional skill set (Sen, 1999).

together many disparate, and often competing, development theories. Whilst there is a growing scholarly corpus associated with sustainable agricultural initiatives, the historical pre-eminence of modernist agriculture amongst large development agencies has meant that it is primarily smaller and more ideologically mobile NGOs that carry out most of the novel programmes on the ground. NGOs can form rapidly around new fashions in development and some pre-existing NGOs with less institutional inertia are quick to respond to post-industrialist trends in sustainable and participatory development. Whilst this might initially mean that NGOs are pushing the frontiers of practice, this thesis will discuss how the middle and long-term fate of these NGOs is difficult to predict. New and contested paradigms, such as sustainable development, inherently contain unresolved discursive inconsistencies that are not easily managed by small institutions.

Within environmentalism there is a tension between reformism and radicalism, and between technocentrism and ecocentrism. Because of its roots in environmentalism the same tensions exist in debates about sustainable development. (Adams, 1995: 88)

I view national-level NGOs like CEDAC as meso-level brokers, whose task is to reconcile the diverse demands of macro-level discourse, donors and the realities of local conditions (D. Lewis & Mosse, 2006). This thesis focuses primarily on how CEDAC negotiates the discourses of empowerment, neo-liberal marketisation, participatory development and sustainability (I have already discussed the latter two). Empowerment is a relatively loosely defined term that is closely associated with the works of Paulo Freire concerning ‘conscientisation’, and is generally seen as the development of the “potential of poor people to challenge structural inequalities through education, organization, and mobilization” (D. J. Lewis, 1997: 35). Neo-liberal marketisation refers to the compromises made to post-industrialist knowledge systems in order to enhance their effectiveness and

survivability in a society dominated by capitalist ideology and functioning. Embedded within these discourses are world-views and practices that are not necessarily commensurate with each other, or with donor requirements and local conditions. Strategic compromise is necessary to combine these disparate demands in a unified framework of sustainable development.

An NGO such as CEDAC engages in strategic *translation* in order to assemble an institutional framework that outwardly exhibits coherence and functionality despite the internal contradictions of internalising so many disparate discourses. However, NGOs are far from being at the mercy of their stakeholder discourses. By operating at the “interfaces of different world-views and knowledge systems”, NGOs are strongly positioned to negotiate novel representations, discourses and practice of development (D. Lewis & Mosse, 2006: 10). But to say that an NGO is able to reconcile complex demands and mould its own framework does not mean that this process is without contention. Furthermore, the institutional nature of NGOs—their bureaucratic operations, motivational needs, growth aspirations and personnel—generates institutional pathologies and barriers that complicate how “development meanings are produced and negotiated *in practice*” (D. Lewis & Mosse, 2006: 9).

2.4.1 The Cambodian Center for Study and Development in Agriculture (CEDAC)

CEDAC is a national-level NGO in the throes of redefining its self-image and operating structure in response to the perception that their initial programming was limiting their potential to respond to emerging development challenges. Founded in 1997 by a cadre of seven Cambodian professionals focussing on the promotion of low-external input, management-oriented agricultural extension, CEDAC was poised to benefit from the growing movement within the development industry for partnerships with national NGOs. The

French NGO GRET⁴ was the first to co-sponsor CEDAC's activities by providing seed funding from which it was able to develop its initial rural programmes. This recognition and the base programmes it spawned attracted funding from Oxfam America and, in subsequent years, many other donors. The primary draw of CEDAC during this early period was its success in farmer-to-farmer extension, SRI cultivation, and other sustainable land intensification and management practices. CEDAC's initial identity and purpose were relatively clear: it was promoting agricultural practices embedded in the sustainable agricultural discourse and its work symbolised the alternative to the modernist AusAid-funded project of the International Rice Research Institute called the Cambodian Agricultural Research and Development Institute (CARDI).⁵ Following the “additive” logic of sustainable development, CEDAC began expanding the scope of its programming rapidly. It began establishing Farmers Associations (FAs), intended as an umbrella under which local interest groups could form and information could be disseminated. These FAs are viewed by CEDAC as an entry point for empowerment programming and a forum for farmer-to-farmer extension and local cooperation.⁶ FAs were also, importantly, the organisational hub for local savings groups that provide one alternative to high-interest moneylenders and large-scale microfinance organisations.⁷ FAs, thereafter, enabled the recruitment of farmers into CEDAC's Natural Agri-Product Marketing Program, which provides market assistance for promoting organic agricultural products. After years of very rapid institutional growth under these conditions, CEDAC highlighted at their 10th Year Anniversary celebration in Phnom Penh on 1 August 2007 that it was moving toward a market-oriented approach to sustainable agricultural promotion.⁸

⁴ GRET is known as the Group for Research and Exchange of Technology.

⁵ Yi, 21 September 2007, personal communication

⁶ Ibid. personal communication

⁷ The convenience, scale and purpose of the loans being sought often determine where a person seeks out credit. Structural differences between these three sources of rural credit mean that none will ever be *the* preferred alternative.

⁸ Yang Saing, 1 August 2007, personal communication

Immediately after the anniversary, large-scale meetings were held to communicate the rationale for this decision and initiate the so-called “business plan”. The plan, CEDAC hoped, would enable a performance-oriented institutional culture and bypass some of the structural constraints in promoting markets for sustainable agricultural products. By 2008, CEDAC had divided itself into three “Core Programs”: (1) agriculture and social development, (2) agri-based enterprises support and (3) the CEDAC Institute of Local Development (CEDAC, February 2008). The first Program could be seen as the “original” programme of CEDAC, focusing on SRI extension, ecological livestock raising and group formation. And although only one of these Core Programs (number 2) explicitly deals with business and enterprise, a private sector-like performance orientation has suffused institutional practice in all three Programs. The implementation of the “business plan” has thus become the third stage in CEDAC’s institutional history, following from its initial focus on agricultural extension, and subsequent focus on group formation and empowerment programming. Analysing the process through which CEDAC reached this juncture is critical to understanding how organisations balance the evolving discourses of sustainable development with the practical challenges inherent to operationalising them.

2.4.2 The System of Rice Intensification

This thesis primarily focuses on one product of agroecological research employed by CEDAC, namely the System of Rice Intensification (SRI) developed in Madagascar by the Jesuit missionary Henri de Laulanié (1993). Although involved in developing many improvements to rice cultivation in conjunction with farmers since arriving in Madagascar in 1961, Laulanié and his students made a serendipitous discovery during a drought in 1983, namely that transplanting young seedlings improved yield. Continued experimentation led Laulanié and his teams to develop a set of principles that eventually became known as the

System of Rice Intensification (Uphoff, 1999). Although originally composed of a few practices, the range of cultivation techniques now subsumed under the framework of SRI has grown considerably over the years. Its leading proponent, Norman Uphoff, now uses SRI as an adjective rather than a noun (e.g., SRI rice, SRI practices). Laulanié's original formulation (according to Uphoff, 2005) is as follows:

- ❖ Transplanting younger seedlings (age 8-15 days)
- ❖ Transplanting individual seedlings with increased and regular spacing between hills (25cm or more)
- ❖ Maintaining a moist, not saturated, paddy
- ❖ Applying proportionately more organic matter, rather than chemical fertilizers
- ❖ Controlling weeds frequently, particularly with a mechanical weeder

Subsequent additions to the set have stipulated shallower transplanting, same-day transplanting, additional ploughing and field levelling, elevated nurseries, and an enhanced focus on seedling and seed selection. Critical to understanding the nature of SRI is that both *wholesale adoption of practices and strict conformity to the stipulated parameters is not necessary to see improvement in productivity*. Also important for a comprehensive analysis, based on total factor productivity and environmental imperatives, are the potential seed-, water-, labour- and fertilizer-saving features accompanying some of the steps (Satyanarayana et al., 2007; Uphoff, 2003, 2006b). Improvement in overall soil fertility is another potential by-product.

In South and East Asia, SRI cultivation has spread rapidly and become popular amongst development organisations, yet it continues to be contested by certain members of large agronomic research institutions. In mainstream sustainable agricultural discourse, SRI is considered one of many LEISA (low external-input and sustainable agriculture) techniques,

which are held up as models of ecological sustainability and championed as agricultural innovations that are particularly accessible to resource-poor farmers. In practice, LEISA techniques such as SRI have often been criticised for producing low outputs (yields), not making good on adoption expectations, being only appropriate in limited circumstances, and not even being theoretically possible (Dobermann, 2004; McDonald et al., 2006; Moser & Barrett, 2003; Sheehy et al., 2004; Sheehy et al., 2005). Rebuttals by SRI advocates point to specific data and methodology problems with the critical assessments and are often quick to point out the widespread civil society support and rapid proliferation amongst farmers in several countries (Stoop et al., 2002; Uphoff, 2006a). The controversy over SRI is far from over and has been covered in *Nature* (Surridge, 2004) and the International Rice Research Institute's newsletter, *Rice Today* (Uphoff & Sinclair, 2004).

2.5 Applied Actor-Network Theory

The methodological suggestions arising from a conceptual understanding based on actor-network theory are typically concerned with reassembling in full view the mechanics of actor-worlds that have become obscured over time. As Michel Callon has written, “Successful translation quickly makes us forget its history” (1986b: 28). To a certain extent, CEDAC’s vision of sustainable agricultural and rural development is being continually *punctualised* (Latour, 1987)—a situation in which a complex and historically-constructed system of research, extension, information sharing and institutional practice becomes increasingly opaque whilst inputs into and outputs from the system remain visible. This is not necessarily a deceptive process; it simply describes how complexity is masked in order to present a comprehensible front, just as turning on a faucet does not reveal the enormous complexity of the system of water delivery. The task of the academic, then, is to avoid taking for granted those elements that are veiled by the intermediary ‘black box’ (Latour, 1988) by

exploring and investigating actors that help elucidate how the and why a certain permutation of sustainable agriculture has arisen.

The nature of the actors and groups that perform the day-to-day work of *translation* is viewed more processually in ANT. Let me start with the ‘group’, as this idea is often misunderstood within the conceptual space of ANT. A group is often seen as unitary, or at least a collective unit. However, as Latour famously wrote, there is “no group, only group formation” (Latour, 2005: 27). This is not to say that membership is fleeting, but that group goals and make-up constantly evolve with enrolment and ‘displacement’ of functional roles. Groups constantly reaffirm their existence, draw boundaries around themselves and other groups, or even create *anti-groups*, which provide a competitive basis for functioning (Latour, 2005: 31-33). Groups also define themselves by their engagement with various ‘matters of concern’ (controversies or discussions on which the group has taken a side). In the end, however, it is member-actors who determine the group’s ideological and functional evolution. These actors include the leadership and general membership, but also the non-human objects involved in the group functioning. These actors can have intermediary roles, in which they simply transport meaning without transformation, such as computers and newsletters; actors can also be mediators, for which they transform, translate and distort meaning (e.g. NGO leadership, extension staffs, or even a new agricultural technique). The agency of non-human actors cannot be underestimated in this context—indeed just as hammers ‘hit’ nails, and baskets ‘hold’ fruit (Latour, 2005: 71), SRI ‘provides’ rice for rural farmers. Actor-network theory thus points to the dynamics of actor behaviour and group formation as potential keyholes through which the ‘practical metaphysics’ of *translation* can be unpacked and analysed.

To preface the empirical and ethnographic evidence I present below, I highlight a few themes directly relevant to this case study. Foremost, *interessement* is one of the primary translation exercises employed in the development field in general. Organisations or leaders

create practical or ideological incentives for joining concrete projects or activities that draw on the moral resources of ideas such as ‘sustainable development’ and on the practical (i.e., financial) resources of the ‘field of development’. Before and after recruitment, ‘sustainable development’ is *problematised* in such a way as to create a host of initiatives or activities (e.g., development projects, technological innovations, environmental awareness, etc.) that are able to attract, retain and put to use a variety of human and non-human actors such as field staffs, SRI techniques, farmers, agricultural inputs, offices and expatriate workers. Certain projects, or technologies, such as the SRI, become gatekeepers, or obligatory points of passage, through which access to other initiatives, such as trainings, Farmers Associations, women’s groups and organic markets, become available. Leaders, such as the president of CEDAC, the director of the Cornell International Institute for Food and Agricultural Development (CIIFAD), and the humble Farmers Association head become ‘translation centres’ or ‘translation spokesmen’ which guide (and yet are guided by) translation in the actor-world (Callon, 1986b: 25). Activities such as writing reports, taking surveys, applying to donors, organising producer group meetings and publishing research papers serve as constant *displacement* (or “buzz”) that distracts actor-members from the controversies of their work. These series of activities and their constituent interactive forces is summed up in actor-network theory as ‘practical metaphysics’ (Latour, 2005: 59-62), or the churn of activities that, inevitably, must head in some direction.

3.0 ENCOUNTERING THE EXTENSION AND EMPOWERMENT SYSTEM

Although village life in the study area of Takeo province is marked by the gradual permeation of development into rural areas, the pace at which change occurs is decidedly quickened by NGO intervention. Without arguing for intervention-determinism, I have observed participating villagers and village chiefs reiterate that, to some degree, there is ‘life before CEDAC’ and ‘life after CEDAC’.⁹ Along with migration, monetisation and political stabilisation, agricultural programming has become a significant feature of the social landscape. Whilst testing SRI cultivation or joining an interest group under the umbrella of the local Farmers Association usually signifies involvement with CEDAC, there are significant ways in which non-participants can be affected by rural development programmes. In the following, I briefly discuss the historical context of agricultural production in Cambodia and then describe programmatic components of CEDAC’s rural agricultural development initiatives. Subsequently, I address how CEDAC staffs view rural people and, in turn, how rural people encounter the extension and empowerment programming. In particular, I aim to critically evaluate the informal *mental categories* of farmers understood by many CEDAC staffs. This typology includes the (a) “pioneers”, (b) “wait-and-sees”, and the (c) “difficult group”.¹⁰ This informal typology is as much used to categorise farmers based on their capability and willingness to attempt SRI as it is used to justify not addressing the constraints facing these farmers. I conclude that a substantial portion of the non-pioneers should be relabelled “strategic agents” because, far from being “difficult”, they have meaningfully engaged with SRI and encountered constraints to adoption that cannot be written off as character traits. To conclude, I discuss the perspectives of CEDAC staffs on their encounters with farmers, drawing particular attention to their stereotypes, sympathies

⁹ Vuñ (pseudonym), 24 August 2007, personal communication; Sosay (pseudonym), 29 August 2007, personal communication

¹⁰ Yi, 21 September 2007, personal communication

and frustrations. The purpose of this exercise, in addition to contextualising the dynamics of extension and empowerment, is to explore the disparities between the representations and the “realities” of farmers encountering CEDAC programming for the first time.

3.1 Historical Context of Agricultural Production in Cambodia

In order to more deeply contextualise CEDAC’s experience, I now present the contemporary history that has shaped agriculture and rural conditions in Cambodia. More precisely, I wish to discuss the political history of Cambodia’s revolution in the 1970s and the subsequent state-making carried out by the United Nations. There are a few residual effects of Cambodia’s conflicted contemporary history that are useful in contextualising the current situation. Firstly, the utopian agricultural communalism of the Khmer Rouge inspired a post-regime backlash in farming practices in the 1980s that saw farmers embracing chemical inputs previously banned categorically by the regime, and engaging in far more individualistic cultivation than previously (Ovesen et al., 1996).¹¹ Secondly, during the Khmer Rouge period, many people learned skills for organic farming and many small-scale agricultural infrastructure features were built and are still in use. Thirdly, the isolationist nature of Kampuchea under Pol Pot meant that Cambodia was largely left out of the earlier schemes for the Green Revolution. AusAid/IRRI have made ushering in the ideals of modernist agriculture a prominent goal in Cambodia, but others see this as an opportunity to avoid many of the Green Revolution’s blunders. Cambodia’s conflict-induced setback in economic development has also meant that other countries are well positioned to leverage their agricultural models and products upon Cambodia. Indeed, donations of fertilizers and pesticides to Cambodia during the reconstruction in the 1980s led many rural people to gain a

¹¹ Ovesen’s “every household an island”-thesis has been rightly criticised for missing and mischaracterising much of communal life in the Cambodian countryside. However, insofar as individualisation was more pronounced in the decades following the Khmer Rouge period, Ovesen’s thesis has some foundation.

dependency on external inputs. Rural life in Cambodia, in general, is at a critical juncture where market forces are radically changing the face of social interactions and agricultural livelihoods (cf. Colletta & Cullen, 2000: 29; Krishnamurthy, 1999; Ledgerwood, 1998; Ovesen et al., 1996; Sedara, 2001). It is precisely this rapid marketisation and the lingering influences of the Khmer Rouge conflict that sustainable rural development will be compelled to accommodate.

And finally, after the United Nations Transitional Authority in Cambodia (UNTAC) supported elections in the 1990s, effectively opening Cambodia up to international intervention for the first time since the Khmer Rouge era, an extraordinary amount of foreign NGOs and development agencies began pouring into Cambodia with humanitarian aid (Vickery, 1992). As the acute humanitarian crisis was largely over due to the ouster of the Khmer Rouge by the Vietnamese a decade before, many re-organised rural communities were confronted with rich foreign entities that freely distribute food, livestock, equipment and consumer goods (Chong, 2003).¹² By the end of the 1990s, the Khmer word *angkah* (the organisation), which had previously been used to reference the Khmer Rouge decision makers, had quickly taken on the connotation of charity organisation, or “giving organisation”.¹³ As a result, the conception of the ‘giving *angkah*’ has largely become monolithic in the countryside, with famine relief, charity and rural development projects all being lumped together in the same conceptual space.

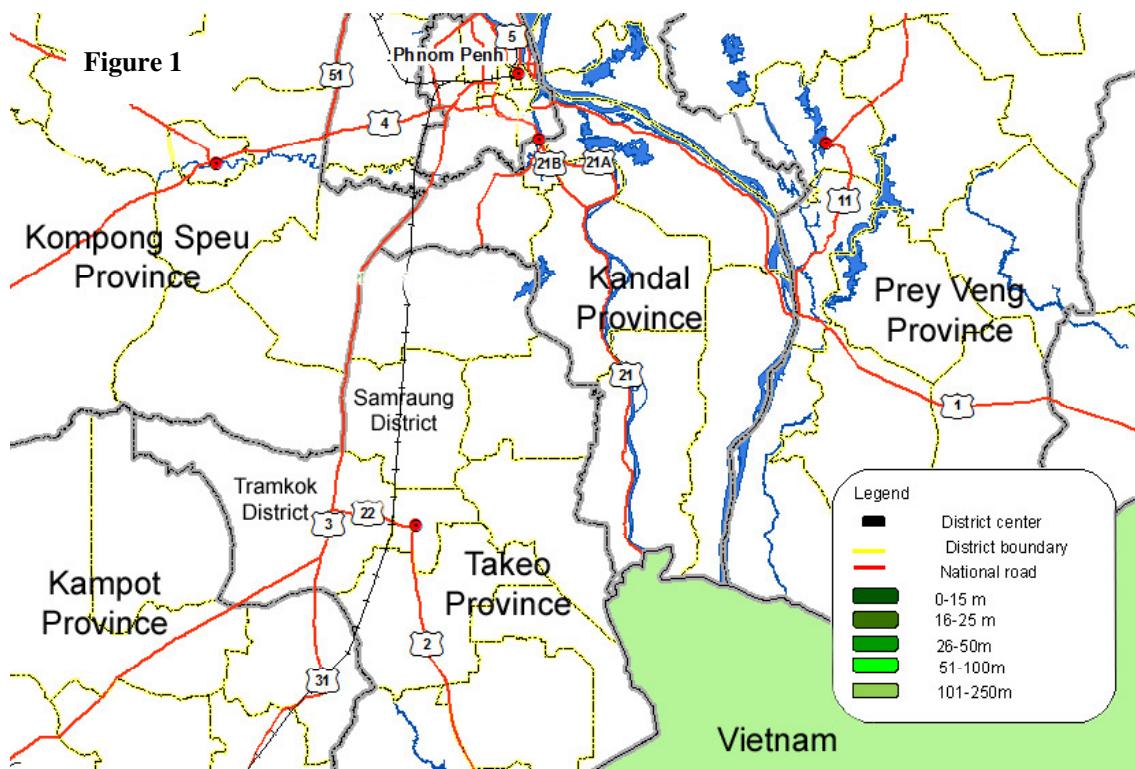
3.2 CEDAC Programming in Zone II

The Cambodian Center for Study and Development in Agriculture was established in 1997 and has since grown to encompass major agricultural research and rural development

¹² Although famine relief in specific areas, such as refugee camps and urban areas, was coordinated by UNICEF and the World Food Programme prior to UNTAC (i.e., during the Vietnamese occupation), the arrival of NGOs and development agencies generally begins with the UNTAC period and also includes humanitarian assistance implemented by UNTAC itself.

¹³ Teap (pseudonym), 12 July 2007, personal communication

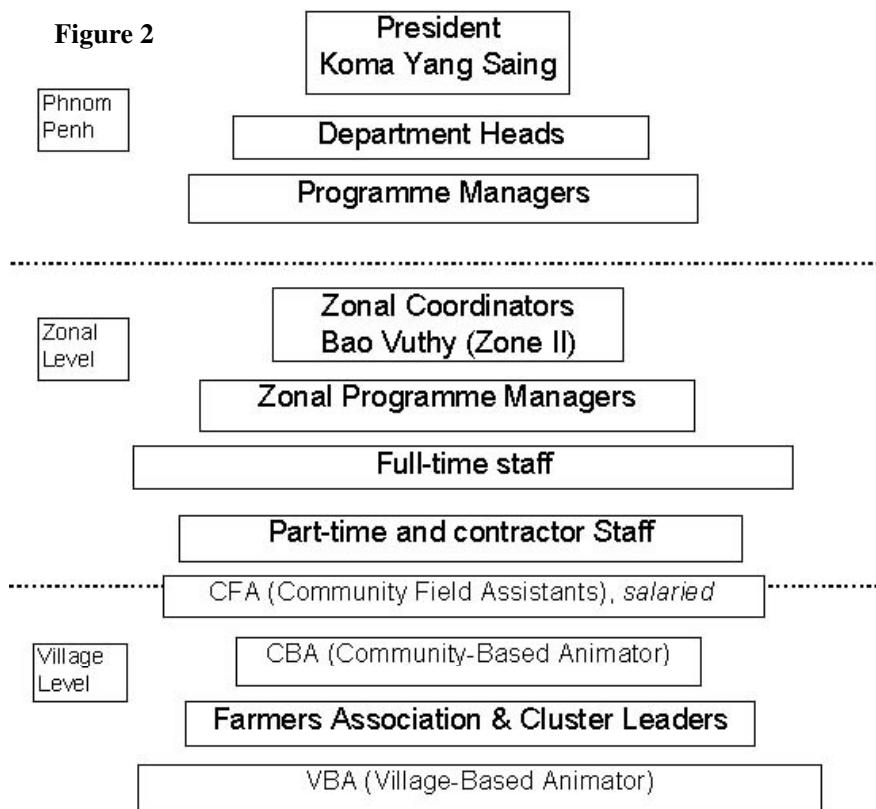
initiatives in 15 out of Cambodia's 20 provinces. By their own report, country-wide they directly supported over 65,000 families (~325,000 people) by 2007, which comprises about 4% of Cambodia's farming population (CEDAC, 2007a). They exclusively target smallholders and focus, in particular, on increasing food production, maintaining environmental sustainability and promoting social cohesion and cooperation. Although CEDAC is primarily donor-supported, they also derive income from service contracts, membership fees, publications and sale of organic produce. Geographically, CEDAC has split Cambodia's rice-farming regions into four administrative Zones,¹⁴ each of which has a central hub and operates in a semi-autonomous fashion that includes limited, but important, links to the headquarters in Phnom Penh. This thesis focuses on the southern lowlands of Zone II, specifically two districts, Samraung and Tramkok, in Takeo Province (see *Figure 1*).



¹⁴ Additionally, there is one "Special Zone" in Ratanakiri province in northeast Cambodia, which has a markedly different focus than work in CEDAC's other Zones.

Functionally, Zone II operates fairly autonomously from the Phnom Penh office, but there are important backward linkages that help maintain its coherence within the overall organisational framework of CEDAC. By and large, the activities of the Zone II office are funded independently by individual donors. Only in rare cases should the Zone have to draw on central funding for continuation of its programming. Mid-level staff members are also primarily engaged at the Zonal level—typically they are attached to a specific donor-project and see themselves chiefly as a member of that team and only secondarily as a member of the CEDAC staff. In practice, the project leaders take up the day-to-day managerial duties whilst the overall boss, the Zonal Coordinator, is charged with maintaining coherence within and between donor-projects, communicating with the headquarters in the capital and occasionally controlling the finances. The headquarters, in turn, conduct national-level research and impact studies, produce publications for extension and sale, centralise the collection and marketing of organic produce from the provinces, and serve as a training and inter-Zonal forum. As shown in *Figure 2*, these activities are presided over by department heads (e.g., for research and development) and programme managers (e.g., for SRI extension). The president and co-founder of CEDAC, Mr Koma Yang Saing, is an executive director, researcher, charismatic figurehead, but also a colleague to most CEDAC staffs.

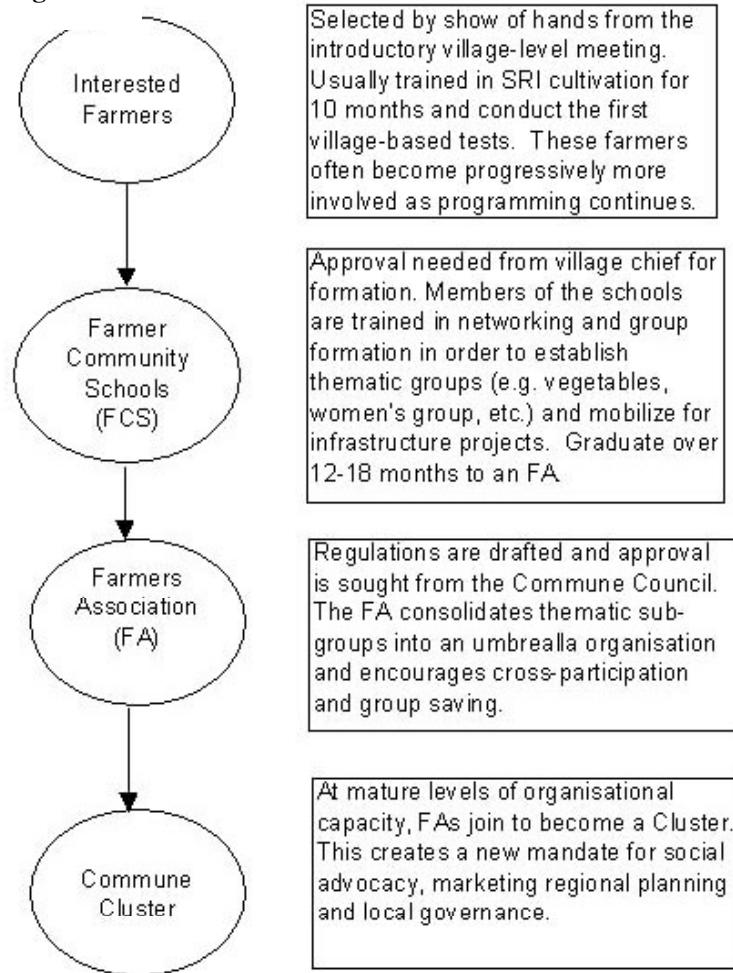
Figure 2



In complementary fashion, analysing the forward linkages from the mid-level Zonal staffs to the villages is important for understanding how CEDAC configures its system of agricultural extension and network formation for long-term functionality. Generally, full-time staffs and specially-trained part-time (or external) workers, employ a number of village-based representatives to facilitate and perpetuate programming. Community Field Assistants are villagers who receive compensation for coordinating and hosting events, communicating with local authorities and people, and conducting trainings. They are joined by Community and Village-Based Animators, whose volunteer mandate is to promote group formation and farmer-to-farmer agricultural extension at the commune and village levels. Farmers Association and Commune Cluster leaders, unlike other self-selected facilitators, are elected to their positions and serve primarily to manage the day-to-day affairs of their umbrella organisations and promote their growth, although they often take on multiple roles. Over

time, CEDAC staffs expect that village-level and commune-level agents will progressively grow in capacity and sense of ownership, which should be accompanied by a parallel disengagement by CEDAC staffs. *Figure 3* describes how a group of interested farmers selected at an introductory meeting eventually evolve into progressively more autonomous Farmer Community Schools, Farmers Associations, and Commune Clusters. With each institutional advancement, CEDAC staffs distance themselves more to save on resources and, ostensibly, in order to encourage greater self-sufficiency.

Figure 3



Whilst CEDAC's activities in Zone II are comprised of a diverse array of individual donor-supported projects, the region is particularly well-known for its high adoption rate of SRI. Currently, nine projects are being carried out in Takeo province, four of which focus on the promotion of SRI and local organising for empowerment. The other projects focus on issues such as microcredit, school attendance, young farmers and local administrative reform (Bao, 2007). Of these nine projects, two are of particular significance for this thesis, due to their geographical overlap with the fieldwork sites in Zone II: (1) the Sustainable Rice-Based Livelihood (SRL) project, supported by the German Church Development Service (EED, Evangelischer Entwicklungsdienst) and (2) the Improving Livelihoods of Farmers project in Tramkok district (ILFARM-TK), supported by the Japan International Cooperation Agency (JICA). The latter project is arguably the most successful of CEDAC's projects due to its success in SRI extension and local organising for empowerment. Tramkok district has thus become the flagship region for CEDAC and is one of the foremost areas toured by outside observers, donors and politicians.

3.3 CEDAC's Typology of Farmers

3.3.1 The “pioneers”

From CEDAC's perspective, rural people who exhibit a high level of willingness to participate and adopt techniques are commonly referred to as pioneers. To some degree, pioneers are self-selected—those with the confidence, entrepreneurial spirit and material resources who come forward voluntarily. In other cases, pioneers are “made”, either by direct payments for participation or through the reception of an official title. A pioneer's standing, or renown, in the “sustainable agricultural community” is largely determined by his or her degree of penetration into various nested spheres of influence. Mey Som, the “first”

pioneer of SRI in Cambodia, is a national-level figure who has contributed heavily to the corpus of agricultural innovations, local organising practices and livelihood philosophies promoted by CEDAC and academics. Prak Ches, a regional-level pioneer of SRI, multi-purpose farms and environmental thought, is well-known in CEDAC's Zone II. Teap Mom (pseudonym), a village head and SRI farmer, has become a leading figure at the commune-level for his leadership abilities and presence in local organisations. Dein Toin (pseudonym), a village-level hero, achieved notoriety for his record-breaking SRI rice yield in 2004, but has remained aloof of local organising. Lop T'neen (pseudonym) is a "pioneer" because he simply tested SRI in the first year that CEDAC came to his village. Many others are considered pioneers simply because they adopted SRI practices with "no questions asked". The liberal conditions by which one can become labelled a "pioneer" suggest that CEDAC uses this label to honour these farmers for being so readily recruited. For CEDAC, pioneers of all types become critical leverage for promoting the success of agricultural programmes to donors and are indispensable agents for assisting in the diffusion and extension of new agricultural techniques and group organising activities.

Contrary to the traditional connotations of the word "pioneer", such as independence and autonomy, pioneers in the context of CEDAC's agricultural programming are "recruited" actively. There are two primary routes for this recruitment. One route, which usually comes chronologically first, requires the purposeful selection of key local people, usually based on their status as village head or renown for being a particularly talented farmer. These villagers are either paid directly to field-test certain agricultural techniques¹⁵ or are ennobled by staff members to be key facilitators in the ensuing programming. Very often, these people are charged with organising the first village meeting or performing the first local-level field-test of SRI. These key individuals pave the way for a subsequent round of recruitment—the

¹⁵ The practice of funding individual farmers has diminished markedly since the early years of CEDAC (perhaps up to 2002). Now, CEDAC's reputation and networks largely set the stage for early collaboration. Initially, payment was provided to insure farmers against the risks of trying experimental cultivation practices and might be seen as a 'research partnership'. However, one cannot deny the utility of this practice in "making" pioneers of local individuals.

soliciting of “interested farmers” during an introductory town hall meeting held in the village. Attendees usually hear a participatory presentation by CEDAC staffs and are then asked, by a show of hands, who is interested in testing SRI. In subsequent years, some of these interested farmers will passively garner the title of “pioneer”—especially if they themselves become promoters of SRI.

As the CEDAC-initiated programming becomes more established and grows in scale, opportunities for upward mobility by pioneers become numerous. As the set of agricultural techniques expands from SRI to vegetable intensification, sustainable livestock production and to multi-purpose farming, pioneers feel continuously obliged to take part in more activities. Usually this entails increasing involvement in Farmers Associations, producers’ groups, Commune Cluster organising, and eventually village enterprise activities. Drawing pioneers into positions with more responsibility is a rather subtle process, and before they know it, many pioneers are “neck-deep” in CEDAC’s programming.

There is one boundary, however, that pioneers do not transgress—they do not become official representatives of CEDAC. Whilst some titles, such as Community Field Assistant, come with a small stipend to defray travel costs and lost work time, and some farmers are seen as peer ‘researchers’, *villagers are not seen as potential extension workers or staffs*. Pioneers are CEDAC’s insiders, their agents of change in the rural areas. In part, there is an unspoken obligation of villagers to remain ‘humble’ and remain close to the fellow villagers they are meant to instruct. In part, this is an expectation typical of mainstream institutional development discourse, which sees development as sedentary, or about “enabling people to stay ‘home’” (Bakewell, 2007; DfID, 2007: 37). Um Mey, a famous national-level pioneer of SRI and women’s empowerment from Prey Veng province, opened her statements at CEDAC’s 10th anniversary celebration by saying, “I am a farmer, and illiterate.” She went on to describe herself as thoroughly rural and restricted her aspirations to those possible within the framework of her village of Ba Phnom. The imperative for a sedentary livelihood, or at

least lack of out-migration, is widely agreed upon by CEDAC staffs, and this ideal is transmitted to local people.¹⁶ By avoiding direct employment, CEDAC (a) encourages pioneers to maintain their insider status by remaining ‘humble villagers’, (b) retains pioneers as crucial elements of local farmer-to-farmer extension systems and (c) uses them as exemplars of “successful” development that has avoided out-migration.

3.3.2 *The “wait-and-sees”*

Particularly as SRI cultivation is usually the ‘entry point’ for broader agricultural programming, there are many farmers who prefer to allow pioneers to take the initial experimental risks. Although some farmers may have previously heard of SRI, they want to make certain that the proposed cultivation changes are suitable for their local agro-ecosystem. Generally, wait-and-sees are exposed to CEDAC through an introductory meeting or by word-of-mouth and have elected, for a variety of structural and personal reasons, not to experiment in the initial year. The quotes below illustrate two typical outcomes of waiting:

In 2005, I started SRI. Even though I saw people from previous years getting high yields, I just wanted to test it for myself. I tried it on 6 ares. That year we had a good crop. But since then we have had bad weather and other problems unrelated to SRI – pests and accidents. But I know these did not cause the lower yield for SRI, so I did half my field the next year [2006] and this year I did all SRI. (male, age 42, Samraung district)

My parents trained with CEDAC the first year they came here [2004]. Whenever I came over for a meal, they tried to convince me to join them but we wanted to wait.

¹⁶ Prak, 12 July 2007, personal communication

They got a good yield that year, but it was hard to manage the water and they got less straw. We have bigger water problems and just enough straw for the cattle now. So we decided not to try SRI. (female, age 26, Tramkok district)

Many farmers such as these are sceptical of CEDAC's claims about high yield or they are risk-averse and concerned that the new system may not be reliable or appropriate for their fields. Others lack confidence in their ability to implement the system or feel socially awkward about trying something new. The experience of having one's primary activity (farming) fundamentally transformed is rather unsettling to farmers and erodes their confidence.

I don't want to learn anything from [CEDAC]. I think their training cannot be better than what I know, since they cannot understand the water situation like I can. The new generation always thinks they know better. It is disrespectful for [young people] to tell me that I have been growing rice in a bad way for 40 years. (male, age 55, Tramkok district)

Whilst there are indeed formidable constraints to *full* adoption, the possibility of applying as many or as few SRI “steps” as desired and the relative ease of making a small test plot mean that the costs and risks of trying SRI are low. The existence of so many wait-and-sees (approximately one-third of my sample) suggests that complex social constraints affect the propensity to experiment. I will explore these in detail later. However, these constraints can serve as a rough filter for weeding out farmers who might not subsequently join CEDAC’s broader organisational and empowerment activities. Once a village has received its initial SRI training, the “wait-and-sees” are on their own in deciding whether to apply SRI or not—they do not require intervention by CEDAC. That said, the personal initiative of

many passionate field staffs often transcends this operating imperative, especially when it comes to including socially important individuals and women.

Because Pisey [pseudonym] always came to compliment me and encourage me, I worked harder on my field. And some days I went to the mountains to collect green compost to impress her. Now my land is good and I hardly ever need to travel far to collect green compost. (female, age 32, Tramkok district)

3.3.3 The “difficult group”

The “difficult group”, from the CEDAC’s perspective, are those farmers who, in spite of agricultural training opportunities, elect not to take part in rural agricultural development programming.¹⁷ For CEDAC, “difficult” means that the farmer exhibits a personality trait, such as conservatism, irrationality, or closed-mindedness that affects his or her ability to judge SRI on its merits. This rather imbalanced representation lumps together those with and without legitimate constraints to participation because it presumes that SRI is objectively superior in most, if not all, cases. However, within this group, the range of rationales for abstaining varies enormously and could be disaggregated in order to determine whether a farmer is “difficult” (in terms of his or her character) or constrained in ways that (unfairly) limit his or her capability to implement SRI.

I would likely not recommend SRI to many others, because I think those who can manage to do SRI with their land have already started and know about it. A few more people have started this year on small plots, but there are so many that just cannot do it because of their land. (male, age 36, Tramkok district)

¹⁷ Yi, 21 September 2007, personal communication

In a list generated by farmers and field staff at a workshop, “lack of agricultural techniques and knowledge” and “laziness” were the top two reasons for why people are poor (field notes, 7 September 2007). The first reason effectively legitimises CEDAC’s role as purveyors of agricultural techniques in the countryside, whilst the second reason summarily justifies why some misguidedly do not take up these techniques. There are clearly individuals who might be considered “difficult”, such as those holding a personal vendetta against a village head and thus unwilling to take part in any projects associated with him. But there are also many who are facing intractable structural and social constraints or have inadequate information and encouragement.

Because CEDAC staffs (as a result of training and experience) believe that there is a clear answer to most reported constraints, they tend to underestimate the salience of some rather important ones for certain families. In many cases, “laziness” is likely a synonym of “constrained”. For instance, *in theory*, SRI cultivation can be performed with less labour; however, most farmers require a few years of experience in order to reach this stage and are thus put off by overly optimistic claims during training. Many farmers expressed to me that they wished they had been told what problems they might encounter; they did not like being caught off guard!

I could tell that people were surprised about having less straw from doing SRI, and they were worried about how they would feed their cow. And anyway the yield was about the same. That's what I tell people when they ask me about SRI. (female, age 28, Samraung district)

The local rumour mill can magnify the salience of some constraints, which serves to bulwarks the position of many non-adopters. For example, the scientific fact that tall stalks

and improved yield usually counteract the negative effect of lower planting density on straw production is unable to compete with rumours circulating that SRI reduces straw output, and may mean that the family's cow will have less fodder to consume late in the dry season. The "difficult group", as I have shown here, is comprised of a broad range of farmers with many reasons for being unable or unwilling to implement SRI. I have also shown that CEDAC portrays this group as "difficult" in order to rationalise the lack of emphasis made on addressing their constraints. But the underlying reason for why such a heterogeneous group are marginalised from CEDAC activities is because they not only require additional resources (i.e., personal attention, action research) for inclusion, but they have a lower propensity to join CEDAC's other activities, which is essential for CEDAC's growth.

3.4 The "strategic agents"

This final category of farmer families, which I have coined for this study, includes those who have interacted openly (and willingly) with SRI techniques and have found the system wanting in their particular context. This group overlaps with many of those included in CEDAC's "difficult group" but I argue that they are strategic in their behaviour, rather than "difficult". This view prompts exploration rather than marginalisation of their adoption constraints. Primarily, strategic agents include those struggling to overcome structural constraints, those who have experiment with SRI and have abandoned it and those for whom certain elements of the system—but not others—are viewed as unsuitable. The most common strategic agents are those who have "disadopted" SRI. In my randomised sample of 70 farmer families, 30% of my respondents are disadopters.¹⁸ Although disadoption should be seen in light of the "fairness" (or comprehensiveness) of the field-test(s) conducted by the farmer (Moser & Barrett, 2003), I have deliberately chosen the strictest of definitions:

¹⁸ This represents 22 farmers out of a sample of 70. Farmers who disadopted after scaling up (usually after at least two years of testing) comprise 6 out of the sample (9% disadoption).

farmers who have at least tested SRI and chosen not to continue. Some farmers might seen as having “unfairly” disadopted due to an idiosyncratic shock, like poor weather in the testing year, but I maintain that even this should be seen as disadoption because it reflects the lack of warnings, preparation and over-optimism of agricultural extension.

Analysing the motivations and constraints of these strategic agents is particularly gainful, as this sub-group represents farmers who have meaningfully engaged with rural development programming, including SRI, and encountered important constraints. Very often, a farmer who disadopted would provide me a veritable laundry list of their constraints:

I stopped [doing SRI] after 2004. I got less yield, small clumps, and with poor soil and bad water management it was very difficult to do. I also have less compost on my land and had to deal with a big problem of weed problem. Oh right! I also got less straw. (male, age 39, Samraung district)

Resolving the constraints of this sub-group is likely to be the most expedient means of deriving feedback and reflexively evaluating the potential for broader reform and improvement. I will discuss strategic agents and adoption constraints in-depth in Chapter 4.

3.5 Encountering the Farmer – Stereotypes, Sympathies and Frustrations

The experiences of field staffs are partly mediated by rural people’s expectations about both charity organisations and local teachers, and partly by their own professional conceptions of agricultural development (Desai, 2006: 177). Rural people’s expectations have been strongly influenced by contemporary history and current government and educational practices, whilst staffs’ expectations have been shaped by their internalised discourses of development and the day-to-day ‘practical metaphysics’ of in-group logic.

The expectations held by many rural people that NGOs are charity organisations or “giving organisations” (*angkah*), complicates initiatives to work in a joint manner with farmers. Functionally, this makes CEDAC’s day-to-day work challenging, as staffs are required not only to carry out their programmes, but also to proactively dispel the myth that they are a ‘giving organisation’. Although effective at creating a participatory (i.e., non-giving) identity in the long-run, staffs’ initial encounters with rural people are strongly influenced by this expectation. With many respondents during field research, I personally found it difficult to shake their preconception that I was a representative of an *angkah*, which is understandable as most white people roaming about with notebooks in the countryside are such people. The behavioural result of these expectations is fairly consistent: rural people ingratiate and express enthusiasm, but exhibit poor follow-through unless material incentives are forthcoming.

In addition to the power dynamics inherent to being seen as an *angkah*, field staffs often encounter embedded behavioural patterns typically associated with the teaching and educational system in Cambodia. Consider first the situation for teachers in the countryside. Although they are nominally supported by the state, teachers often (have to) solicit additional funds from their students to supplement their salary. In effect, this makes parents their customers. Parents, in turn, also have to forego potential sources of labour on the farm and around the house and are also required to buy uniforms and perhaps a bicycle to enable their child to reach school in a timely fashion. Agricultural extensionists are often seen in a very similar light:

[The field staff member] is like a teacher, yes. We even call him teacher. Well, I come to the classroom although I am often lazy to go. Some students are better than others. They do better homework. And the new way is that he asks us to pay her for his

services or at least food and gas because we have benefited from his training.

(female, age 39, Tramkok district)

The homework, in this case, is the practice of SRI and ecological livestock raising techniques. So although the “curriculum” used by CEDAC for training might be more participatory in nature than traditional teacher-centred instruction, the atmosphere of the trainings is viewed in the same way as school by many informants I spoke with. By viewing field staff as teachers of adult farmers, it is possible to imagine why many people choose not to take part even though there is widespread acknowledgment that improved agricultural practices, like education, are “good for you”.

The notion that improved agricultural techniques are clearly beneficial *in theory* is what underlies the type of professionalism internalised by CEDAC staffs. Because history, experience and theory have shown CEDAC that SRI practices increase yield and because savings groups provide a profitable solution to the lack of rural credit, staffs go out into the field confident that the real work is simply to convince farmers to “participate”. The question of whether SRI cultivation should be practiced at all (by certain farmers) is closed and the new question becomes “how” to efficiently encourage people to adopt. In this way, ongoing scientific disputes, such as those surrounding SRI, are seen by field staff as unanimous findings (Desai, 2006: 174). Having committed, or sold themselves on SRI, field staffs become defensive insiders rather than reflexive instructors and their pedagogy switches from one of education to one of recruitment.

Following actor-network theory, CEDAC staffs thus launch into a type of translation called *interessement*, which is focussed on recruiting people into the CEDAC system through indirect incentivising, such as promising more yield and profits from savings and shared production. Tentative recruits believe they are simply testing SRI cultivation, but are actually on their way towards induction into the broader range of CEDAC activities of which SRI is

only the entry point. In order to sustain the *translation*, recruits are given titles (e.g., Village-Based Animator, Community-Based Animator, etc.) or given the chance to earn titles (e.g., president of the Farmers Association, treasurer, etc.). Recruits are also generally kept busy (*displacement*) organising their group activities, all of which serves to make the question of whether or not SRI serves their needs redundant.

However, whilst the recruits are caught up in the *practical metaphysics* of CEDAC activities, the staffs themselves are indeed caught in a similar web. Because they generally work with those who have been (easily) recruited, the lifeworlds of those who have not taken up SRI become increasingly distant. The discomfort with the existence of such people is the impetus for the three groupings: pioneers, wait-and-sees, and ‘difficult group’. It is also the reason for the lack of a mental category called “strategic actors”. The source, then, of the sense of professionalism within CEDAC is not their educational status or achievements, but that they are veteran members of an actor-world into which they are inducting new members to the lower levels. Likewise, staffs themselves exist as inductees in the chain of *interessement* populated by their managers and bosses, donors, development academics, and development discourse itself.

4.0 RESULTS: INVESTIGATING PAST AND FUTURE NARRATIVES

This thesis is concerned with the evolution of institutional practices of sustainable development and addresses two primary issues. The first concerns the historical basis of the convergence on a ‘market sustainability’ paradigm for sustainable development. The larger question here is whether we have witnessed this in Cambodia as regards CEDAC and what might have brought this about. The second issue concerns how CEDAC is evolving and what the potential might be for the new performance orientation to resolve the issues of accountability brought on by institutional changes over the past 10 years. In order to look at these two separate issues, I will address the current situation looking backward, and subsequently the current situation looking forward.

4.1 The Current Situation, Looking Backward

In the study area, which is a flagship area for their agricultural and rural development initiatives, the view of many donors, development agencies and NGOs is that CEDAC programmes have improved the agricultural production of many farmers in addition to empowering them to engage more thoughtfully with producer and credit markets.¹⁹ In addition, farmers have internalised a set of important ecological concepts and many have significantly reduced or eliminated their use of chemical fertilizers and pesticides. Furthermore, this has been accomplished without risky or unnecessary investments into fossil fuel-run farming equipment or external seed, and has enabled farmers to have more control over cultural change in their communities. Empowerment programming, primarily utilising group formation strategies, has activated networks that have led to enhanced farmer-to-farmer extension, co-operative sales and purchasing groups, certified organic rice sales, improved

¹⁹ Although the list of CEDAC’s “fan club” is numerous, a fairly complete collection of outside views, reports and assessments can be found at website of the Cornell International Institute for Food, Agriculture, and Development (CIIFAD). Web: <http://ciifad.cornell.edu/sri/countries/cambodia/index.html#reports>

local governance and increased social capital. With the initiation of CEDAC's business plan in 2007, participant farmers now also engage in far more entrepreneurial activities, such as shared investment in village shops, organic chicken sales, natural palm sugar production, eco-tourism and all-organic catering. CEDAC's activities are generally looked upon favourably by government, and, in particular, SRI has received support from the Minister of Agriculture, Forestry and Fisheries (MAFF) and SRI's place in policy has been enshrined in the SRI Secretariat, a governmental working group. Many development agencies and northern donors see CEDAC as their darling organisation; indeed, one prominent manager at the Japan International Cooperation Association (JICA) has called CEDAC "our hope".²⁰ Numerous national NGOs approach CEDAC for advice, and many grassroots organisations have allowed their operations to be subsumed into a local CEDAC Farmers Association. These achievements and this recognition are indeed substantial in the realm of rural development, where development programming in Cambodia has produced very little widespread success.

However, in the midst of this excitement, it is worthwhile to step back and investigate what the extent of this success is—where is it justified and where might it be found wanting? Although it is laudable to achieve any broad success in rural development in Cambodia, it is nevertheless helpful to look at the extent of participation, savings and livelihood improvement with a qualitative and quantitative eye, including an evaluation of the assessment methodology used by CEDAC. In the following, I undertake a deconstruction of CEDAC's internal and external representation by independently assessing their works using their own dimensions as well as a few determined by myself with advice from farmers. I expand upon this deconstruction by using statistical methods to determine what associations exist between income, rice cultivation practices, and yield. The conclusions and critiques emerging from this analysis are for the purpose of adding some outside perspective and objectivity to the impact assessment process currently used by CEDAC with an eye toward

²⁰ Anonymous, 23 March 2008, personal communication

improving programming and impact assessment methods. The questions to be answered here are: how does CEDAC internally represent their impact and how has this affected their ability to reflect constructively on their practices?

4.1.1 Asset-based Livelihood Assessment

For the quantitative data gathering, I largely used CEDAC's own sustainable livelihoods approach but I sampled randomly from target villages rather than from registered CEDAC participants, and I employ additional field techniques for crosschecking results. In addition, I use a factor analysis technique developed by Sahn and Stifel (2003) rather than the subjective rubrics developed by CEDAC for income evaluation and cultivation technique grading.

In this study, an asset-based measurement of wealth is used for two primary reasons. First, recent research indicates that this method creates a more accurate ranking of wealth whilst avoiding the many problems inherent to consumption-based income measurement (Sahn & Stifel, 2003). Second, an absolute value for income is unnecessary for making inferences internal to the dataset. As noted by Judy Ledgerwood (1998), Cambodian villages are rather homogeneous communities in which social forces exist that restrain individual families from distinguishing themselves. Assets in Cambodia are typically fewer, easier to measure and, to a large degree, not prone to reporting bias because they are visible to the researcher. Usually, durable assets such as radios, TVs, bicycles, motorbikes, and housing materials are used to construct such a the wealth index. The assets I used were carefully screened for sufficient variance before being included in the factor analysis. For most components of index, it is straightforward to predict the effect on wealth. For instance, the larger the amount of agricultural land and housing floor area, the wealthier the family is expected to be ranked. It is somewhat more problematic, however, to value the quality of the

housing materials. For this, each type of material (bamboo, wood, aluminium, concrete, etc.) was separated into a group representing poor, medium, or high quality material, as outlined by Krishnamurthy (1999) and Ebihara (1968). Dummy variables were created for the poor and high quality materials, whilst an absence of a value for both of these dummies indicates a medium quality material. A delineation of this valuation system can be found in **Appendix 2**. Using the method developed by Sahn and Stifel (2003), and the assets determined by myself (Feuer, 2004), as well as Krishnamurthy (1999) and Ebihara (1968) in their studies of the Cambodian countryside, I factored a composite ranking of the relative wealth of each household in the cross-village sample. The factored weights for the individual components of the wealth index can be found in **Appendix 2**. I verified the accuracy of the factored index values for each household by confirming with qualitative evidence and personal judgment. I confirmed that the poorest and most destitute villagers ranked the lowest in wealth index whilst those ranking near the top held considerable sums of land, a motorbike, and owned a large and well-built home.

4.1.2 Scalar Valuation of Rice Cultivation Practices and Yield

Due to the large variety of potential rice cultivation changes suggested by SRI, it is more useful to view farmers' practices on a continuum rather than defining a certain threshold (Uphoff, 17 July 2007). Building on the work by Sras and Chuong (17 July 2007), I developed a set of dummy, ordinal, and continuous variables representing rice cultivation practices normally associated with, but not exclusive to, SRI. However, rather than making a subjective judgment about the significance (or weight) of each cultivation practice for the quality of technique, as done by Sras and Chuong (17 July 2007), I allowed factor analysis to determine the weights and, like with the asset-income, rank farmer families based on their cultivation practices.

To gather accurate cultivation and yield data in interviews, I employed a number of techniques to help confirm or triangulate the informant's responses. In most cases, I observed the fields directly to evaluate whether certain cultivation practices and field conditions applied and thereafter questioned the respondent directly about other practices. My priority was to reconstruct conditions from the season corresponding to the most recent, and best remembered, yield data. Additionally, I isolated individual plots from the total rice area if the farmer applied different practices to those fields (such as partial SRI). Determining rice yield required considerably more discretion and cross-referencing. Indeed, yield can be one of the most problematic elements to measure accurately in the Cambodian countryside, but I employed a number of resourceful tactics to triangulate these values. In many cases, the farmer simply remembered his previous yield in a certain unit, which I could convert to tonnes/hectare. In other cases, the farmer might admit that the yield was a certain proportion higher or lower than a season that he was familiar with. These values could be cross-referenced with some reliability by asking the primary cook in the family how many "tins" of rice were served per day (adjusting for surplus or deficit, celebrations, and animal feed) and extrapolating to the year. In other rare cases, I could measure the volume of the rice storage vessel and determine the yield based on how high it was filled after harvest.

4.1.3 Through the Figures: Accomplishment and Build-Up

By and large, CEDAC reports on itself much as it reports to its donors—through optimistic brochures, reports and media. As such, my primary sources for this assessment are impact evaluation reports, English-language brochures to celebrate CEDAC's 10th anniversary, and CEDAC's self-representation at press conferences. For comparative quantitative data, I primarily use two of the most recent impact assessments produced by the now-defunct Research and Development Department at CEDAC: one focusing on country-

level impacts (Suon, 2007a), and the other focusing on the area in which I conducted fieldwork (Suon, 2007b). As an alternative angle, I also analysed individual Khmer-language staff reports from Zone II, although these generally do not impact CEDAC's official external and internal representation. In a general sense, however, having in-built resources for gathering the type of data necessary for donor-funding, CEDAC has largely used these same resources as a basis for its internal performance assessments. According to the CEDAC president's statement at a press conference 18 March 2008, 82,000 families, or 4.5% of rice farming families, which engage 2% of rice land in Cambodia, are employing SRI techniques. Overall, the latest impact evaluation from 2007 reports that average agricultural incomes of participants have increased from 1.7 million Riel (~\$425) to 2.2 million Riel (~\$550) during the period 2004-2007 (Suon, 2007a).

Within these figures, several quantitative and qualitative issues emerge concerning the absolute and relative nature of the numbers, their significance overall, and the context they obscure. Firstly, the increased agricultural income (30%) is not calculated using Purchasing Power Parity and came at a time when inflation was hovering between 5-11% (nominal) per annum and spiked to nearly 20% in the early months of 2008.²¹ Secondly, attributing all income increases to project intervention during that time period ignores many exogenous factors, the least of which is the fact that the Cambodian economy grew rapidly (5-13% real GDP growth) in the evaluation years. Whilst poor subsistence farmers are somewhat insulated from the effects of inflation and are not component to the tourism and garment sector-driven GDP growth, the rural economy has not been stagnant and it relies increasingly on consumer goods. CEDAC is not unaware of these statistical problems and also includes a subjective assessment by respondents about their overall living standard (but not about the project's impact's *per se*): 15.6% reported no increase in living standards, 37.2% reported a slight increase, 39.5% reported a medium increase, and 1.7% reported a high increase (Suon,

²¹ See official figures at the National Institute of Statistics (Cambodia): <http://www.nis.gov.kh/>

2007a). This follows my own results very closely, which is to say, it follows the trends of the villagers in general because I sampled from participants and non-participants alike. In other words, many of the improvements observed in CEDAC's impact evaluations could apply to farmer families in areas without any CEDAC intervention. This is not a surprising result, as one would expect even rural villages to improve their livelihoods in the context of a rapidly growing economy.

This conclusion is *not* to say that CEDAC programmes are not improving livelihoods. Indeed the reduction in chemical fertilizer usage, increases in social capital, microcredit availability, and entrepreneurial training are positive externalities, but this does suggest that ecological agriculture techniques are not being applied on a wide enough scale to be significant. That 4.5% of rice farming families practice SRI whilst only 2% of land is cultivated suggests that farmers devote far less of their land to SRI; indeed, as shown in

Table 1, SRI farmers allocate on average 51% of their fields to SRI (CEDAC reports indicate 57-66%). To compound this, less than half of the overall field allocation for SRI receives 'good' SRI treatment,²² which diminishes the yield-raising potential. All of the studies presented in **Table 1** find comparable *per hectare* yield increases from SRI ranging from 49-122%, but this is contrasted by an increase of only 15-36% in overall yield, with the lowest projections emerging from my figures.²³

²² The question of what should be considered 'good' or 'partial' SRI is sharply debated. For statistical analyses, I avoid this problem by employing factor analysis but for the sake of comparison with CEDAC figures, I developed the following definition, suitable for this sample: a farmer is considered to apply partial (as opposed to good) SRI if he or she fails any two of the following conditions: (1) transplanting the same day as pulling, (2) ageing seedlings less than 23 days and (3) spacing hills at least 20cm or more from one another.

²³ Rice-related statistics are directly comparable between this survey and those carried out by CEDAC, as I isolate (as seen in **Table 1**) the sub-group of SRI farmers.

Table 1. Rice land and yield, 2007

	Rice production in the sample (This study)				
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Overall
Total Rice Land (ha/hh)	0.35	0.46	0.59	0.64	0.51
Total SRI rice fields (ha/hh)	0.14	0.28	0.19	0.45	0.26
Total SRI rice fields as a proportion of total	0.40	0.61	0.32	0.70	0.51
Total good SRI rice fields (ha/hh)	0.12	0.30	0.22	0.43	0.24
Total partial SRI rice fields (ha/hh)	0.19	0.27	N/A	0.56	0.36
Overall rice yield (t/ha)	2.10	2.32	2.10	2.37	2.22
Rice yield excluding SRI (t/ha)	1.89	1.94	1.92	1.98	1.93
Overall rice yield (t/ha) for SRI farmers	2.39	2.68	2.33	2.54	2.49
Rice yield excluding SRI (t/ha) for SRI farmers	2.01	1.80	1.79	1.69	1.83
SRI yield, good SRI fields (t/ha)	2.57	2.92	2.57	5.03	3.07
SRI yield, partial SRI fields (t/ha)	2.43	2.87	N/A	2.65	2.65

Rice production in the sample (Samraung Report, CEDAC)

	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Overall
Total Rice Land (ha/hh)	0.48	0.76	0.78	1.07	0.77
Total SRI rice fields (ha/hh)	0.32	0.54	0.48	0.91	0.57
Total SRI rice fields as a proportion of total	0.67	0.71	0.62	0.85	0.74
Total good SRI rice fields (ha/hh)	0.17	0.27	0.25	0.34	0.27
Total partial SRI rice fields (ha/hh)	0.31	0.46	0.38	0.79	0.50
Overall rice yield (t/ha)	2.48	2.26	2.84	2.34	2.48
Rice yield excluding SRI (t/ha)	1.94	1.50	2.40	1.63	1.88
SRI yield, good SRI fields (t/ha)	3.61	2.91	3.75	3.42	3.41
SRI yield, partial SRI fields (t/ha)	2.74	2.56	3.20	2.33	2.74

Rice production in the sample (Country Report, CEDAC)

	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Overall
Total Rice Land (ha/hh)	0.83	1.21	1.38	1.89	1.33
Total SRI rice fields (ha/hh)	0.43	0.64	0.62	0.91	0.66
Total SRI rice fields as a proportion of total	0.52	0.53	0.45	0.48	0.50
Total good SRI rice fields (ha/hh)	0.21	0.28	0.26	0.34	0.28
Total partial SRI rice fields (ha/hh)	0.45	0.62	0.61	0.96	0.67
Overall rice yield (t/ha)	1.78	1.84	1.85	1.86	1.83
Rice yield excluding SRI (t/ha)	1.45	1.41	1.41	1.51	1.44
SRI yield, good SRI fields (t/ha)	3.10	3.10	3.30	3.20	3.20
SRI yield, partial SRI fields (t/ha)	2.10	2.20	2.40	2.20	2.20

The suggestions are based on descriptive statistics but they are also borne out by significance tests and econometric analysis. Firstly, a paired t-test indicates that *SRI yields are significantly higher non-SRI yields*, on a per-hectare basis (see **Appendix 3**). However, two

OLS models below indicate that *SRI application is not found to be a significant factor in explaining overall yield* (see **Table 2**), when controlling for general cultivation practices, soil characteristics and availability of organic matter. Furthermore, the OLS models displayed in **Table 3** show that *SRI cultivation is not significantly associated with wealth*, controlling average yield, literacy, non-agricultural jobs, dependents, soil characteristics, and availability of organic matter. The question of endogeneity between average yield and the SRI dummy variable is a potential issue in these models, but correlation coefficients (found in **Appendix 3**) indicate that there is minimal direct interaction between the two variables.

Table 2. Regression output for two models explaining overall yield

	(1) overall yield		(2) overall yield	
cultivation	0.174 ⁺	(1.75)	0.180 ⁺	(1.82)
soil type	-0.139	(-1.23)	-0.126	(-1.15)
organic matter	0.063	(0.39)	0.064	(0.40)
good SRI	0.216	(1.06)		
partial SRI	0.343	(1.34)		
any SRI			0.254	(1.34)
_cons	2.284*	(9.03)	2.261*	(9.12)
<i>N</i>	70		70	

t statistics in parentheses

⁺ $p < 0.10$, * $p < 0.05$

Table 3. Regression output for two models explaining wealth

	(1) wealth		(2) wealth	
avg. yield	0.404*	(2.21)	0.407*	(2.22)
soil type	0.228	(1.37)	0.275 ⁺	(1.72)
literate	0.581 ⁺	(1.90)	0.522 ⁺	(1.73)
high-paying job	0.225	(0.99)	0.244	(1.08)
low-paying job	-0.339	(-1.47)	-0.315	(-1.37)
organic matter	0.502*	(2.19)	0.501*	(2.19)
residents/hh	0.095	(1.31)	0.071	(1.03)
good SRI	-0.325	(-1.21)		
partial SRI	0.049	(0.15)		
any SRI			-0.191	(-0.81)
_cons	-2.414*	(-3.45)	-2.353*	(-3.37)
<i>N</i>	70		70	

t statistics in parentheses

⁺ $p < 0.10$, * $p < 0.05$

My overall conclusion is that whilst incremental improvement of SRI is positively associated with (and likely causes) increased yield, its effect on livelihoods is statistically insignificant due to a low commitment to SRI, as exhibited by poor technique and limited land area devoted to SRI cultivation. My own fieldwork, and other adoption studies in Cambodia (Rajpal, 2008), indicate that many of the reasons for the lack of commitment by current SRI farmers, including social and structural constraints, can result in low adoption rate, high disadoption rate, and difficulty for extension staffs in recruiting and incentivising CEDAC's programming. This reality is not addressed in CEDAC's internal or external reports because it is not in their interest to interpret quantitative results in a way that presents them in discouraging light—for themselves and for their donors. As a result, the scale of reflexive self-criticism at CEDAC is artificially lower, which diminishes the scope for revisiting components of their field programmes.

4.1.4 From Dynamic Action Research to Holy Pedestal: The Birth and Adolescence of SRI

The challenges and goals of CEDAC were far simpler in its pioneering years, particularly as agricultural research on SRI, multi-purpose farming, and ecological livestock raising were unencumbered by the organisational challenges of needy Farmers Associations, the “business plan”, and the complexities of the 70 donor-funded projects yet to come. Although founded in 1997, the president of CEDAC often publicly regards 2001, the year they began extending SRI, as the important foundational moment in its organisational history.²⁴ Yet, in spite of its pivotal role in recruitment lasting until this day, the technical aspects of SRI have received dwindling focus over the years and now action research concerning how to best tailor and adapt SRI for Cambodia and Cambodians has diminished considerably. As I have already addressed above in regards to re-examining “strategic

²⁴ Field notes from 10th Anniversary Celebration, 1 August 2007

actors”, this is a glaring oversight as there is yet considerable potential for additional adoption and improvement of SRI practices, and thus more prospective recruits for the broader CEDAC system. I chose to describe SRI as having reached adolescence in this subtitle, because, analogously, this is a time when parents begin to give their children independence and it is also one of the most socially and developmentally challenging periods for youth.

The following sections describe what these challenges are through a discussion of adoption and uptake dynamics of SRI. The larger picture, however, is that although 34 out of 70 farmers interviewed nominally apply SRI, the large majority of these farmers apply very few steps due to prevailing structural and social constraints. In fact, none of my informants have been able to apply all of the SRI steps on all of his or her fields. Moreover, only a handful of the SRI farmers I spoke with had any hopes of improving their practice of, and allocation of land to, SRI in the next few years. The challenges for new uptake and deeper adoption of SRI are numerous and generally well-known, but CEDAC has not targeted resources at addressing these issues in recent years or, in the case of structural constraints, admitted that there are intractable problems. Below, I will explore the structural constraints and the social challenges of SRI adoption and conclude with a discussion of why adoption barriers have not been overcome in more recent years.

4.1.5 Structural Constraints to the Adoption of SRI

The primary structural constraints, as I noted in numerous conversations with current SRI farmers and strategic agents alike, concern water management, straw production and organic matter resources.

Water management, as noted in Rajpal (2008), is the most pervasive amongst these three structural constraints as it affects both the ability to implement even the basic SRI steps

and also the potential for optimising growth. Although some farmers could mitigate this problem by digging their own canals, they often lack experience to do so, require a mother canal onto which they can connect their system, or are constrained because the fields they inherited after the Khmer Rouge regime were simply too deep to allow for drainage by gravity. In order to successfully initiate SRI, the window of opportunity for transplanting (8-20 days) is frequently missed because the paddies are either too dry to plough or the water level is too high to transplant younger, shorter seedlings.

I know how to do one-stem, yes. I've talked about it with all of the other farmers who do one-stem. But as you can see, our fields are lower than everyone else's. This is a problem since Pol Pot times. High water damages the young seedlings and makes them more vulnerable to the worm [leaf grub] and anyway SRI needs less water, right? Unless someone drops a mountain of soil on my field, I cannot do SRI. (male, age 45, Tramkok district)

We don't trust the skies these days. The weather is getting more strange. And we have no canal nearby so if the rains stop early we cannot irrigate our fields. This is why we keep all our water in our fields. (female, age 31, Samraung district)

As climate change incrementally makes rainfall more erratic, it becomes yet more difficult to plan for transplanting. Because of the relatively short nurserying period, it is possible to simply stagger the nurseries so as to expand the window of opportunity, but the cost in terms of labour, seed and planning are considerable. This narrow window also complicates ploughing. For farmers lacking their own animal traction, it is difficult to hire others' animals without advance notice and negotiation. For farmers wishing to expand SRI production to their entire fields, there is the added challenge that they must organise skilled

helpers on very short-notice. Those with smaller fields and adequate family labour can usually transplant on their own, but, lacking this, the family is forced to hire outside labourers.

My hired hands agree to do one-stem, but their spacing is narrower and not regular.

If I tell them to use the line [for row-transplanting], they would refuse to work. The hired workers always want to work mindlessly! [interviewer's prompt] Yes, I could hire people who know about SRI... but it's hard enough to find people to work at all these days! (female, age 34, Tramkok district)

In order to hire helpers during the height of the transplanting season, when demand is very high, one must often plan for their arrival weeks in advance and have a large meal prepared. Furthermore, ensuring that uninitiated labourers pull the seedlings gently, and transplant them skilfully is challenging, as is deciding how to compensate workers when the going system is based on a per-40-bundle rate (SRI transplanting avoids bundling entirely). Perversely, many hired labourers are encouraged to transplant more than one stem, as this exhausts the supply of seedlings faster and allows them to return home earlier. Solving the water-related timing dilemmas inherent to SRI transplanting depends on updating infrastructure and water control regulations to such a degree that only very widespread adoption or strong social capital amongst villagers would help in the absence of extant water resource management infrastructure.

Once transplanting is carried out successfully, optimising water levels for SRI throughout the growing period faces considerable obstacles. Although proponents of SRI often refer to the water-saving feature of SRI as a boon, rain-fed rice farmers are often faced with a contradictory set of conditions. During the rainy season, water is in such abundance and flooding so prevalent that releasing water from the fields is generally difficult. Either

neighbours do not allow it or the water table is so high there is no possibility for natural drainage. As the dry season approaches, these conditions reverse: as the farmer is unsure when the rains will stop, he or she is encouraged to begin ponding as much water as possible in the paddies so as to buffer him or herself from the effects of an extended dry spell leading up to harvest. In my research, more than a third of my respondents had switched to mid-season rice varieties because late-season droughts are becoming more frequent. For an SRI farmer attempting to optimise water levels for growth, being caught in a late-season dry spell with low water level spells disaster for the crop. Irrigating from a canal becomes increasingly challenging as villagers compete for water from the canals. Farmers attempting to grow organic rice may also feel hesitant about irrigating with communal water as it likely contains considerable chemical residue from others in the village. In general, almost all of my respondents, including many veteran SRI farmers, referred to various aspects of water management as problems for uptake or further adoption of SRI techniques.

After water management, straw production is the possibly most passionately debated aspect of SRI production and is, amongst my informants, responsible for most disadoption in addition to being a major factor in poor uptake. I admit that I overlooked this topic going into fieldwork because it was scarcely covered in SRI literature and the issue simply did not seem salient enough on its surface. Furthermore, and as CEDAC staffs will fiercely assert, *in theory*, there is no problem with straw production from SRI. Because there are ways of increasing straw output within the framework of SRI, this issue is often discounted. However, doing so disregards the experiences of less skilled SRI farmers, usually those in their first year(s), who have not yet found a way to balance straw output. Indeed, amongst my informants, I found very few farmers who have reached the theoretical straw output claimed by CEDAC. If straw was not such an important element in the farming system, this would not be such a critical concern.

As it turns out, straw (called *chambaogn*) is indispensable for the Khmer farmer family. It is the primary source of food for cattle when grazing resources diminish, kindling for fire starting, compost for subsequent soil preparation, mulch for improved cultivation, and even packaging material for vegetable and fruit sales. In Cambodia, unlike in the fairy tale, straw truly is gold. Indeed, if straw supplies dwindle, the farmer is forced to travel far afield to procure more or pay a market premium for substitute fodder. Travellers in urban areas in Cambodia between June and October will frequently see farmers out under the sun painstakingly cutting grass with machetes in order to feed their cattle at home. As it turns out, the welfare of livestock, cattle more specifically, is more central to SRI adoption than would be readily apparent.

The role of the cow in farmer families in the southern lowlands of Cambodia cannot be underestimated in any plans for agricultural development. Most importantly, they are a store and open expression of the family's wealth, much like a high quality house or ownership of a fancy motorbike (Ferguson, 1985). Calves, in turn, are the hope of any farmer family, and increasing their herd is more unambiguously desired than bearing children. Secondarily, cattle, or usually bulls, are the source of animal traction and short-distance transport. Thirdly, they are the source of an important compost source—manure. And last, but not least, cattle are members of the family. In the dry season, Khmer people lovingly wash their cattle daily and they feel a deep pity, or empathy, for cattle when they are forced to plough, harrow, or pull an oxcart; in lowland Cambodia, cattle are not seen as beasts of burden in the same sense as in the European tradition. For farmers, ensuring that there is an adequate source of fodder for their herd is a close second to ensuring that the household has enough rice to eat.

But we should say that the issue of spacing and less stems makes less straw. Even with our 120 acres [1.2 hectares] in the family and extra short-season rice, we still don't

have enough straw to keep our three cows fat. This village, unlike in Samraung district, doesn't have as much grass for grazing. (female, age 60, Tramkok district)

Do you need more yield or rice stubble? Well you need both. You cannot let your cow die just the same as you cannot let family die. (female, age 36, Tramkok district)

As a result, a cultivation system that produces, *or threatens to produce*, less straw output is not favourably viewed *if the family owns many mature cattle*. Optimum SRI cultivation also requires more intensive land preparation and levelling, which is additional strenuous work for the bulls. Conversely however, the abundance of weeds, which is normally viewed as a problem with SRI, is often less problematic for lowland farmers who are often indifferent to additional weeding because this not only improves their fields but also provides a source of fresh fodder for their cattle.

Does SRI, which increases yield, actually decrease straw output? The most accurate answer is no, but experience on the ground nevertheless shows that many farmers require a few years to reach this level. On the one hand, in the first year of SRI production, rice yield is higher and it continues to increase in subsequent years, given consistent conditions (Uphoff, 2002b, 2006b). In discussion with informants, I have noticed that straw production, on the other hand, is decreased in the initial years for a variety of reasons associated with learning and transitioning one's field. As skill and field conditions improve, stalks grow taller, increased tillering produces more stalks and overall straw output begins to increase above and beyond initial levels—with one caveat.²⁵ The stalks produced by healthy SRI clumps are often thick and robust, which is ideal for plant growth but less suitable as fodder. Unsurprisingly, cattle prefer more tender food; dried SRI stalks are often too strong as a long-term substitute as they are either rejected by the cow or serve to degrade the cow's teeth

²⁵ Teap Mom (pseudonym), 21 August 2007; Bao, 13 July 2007, personal communication

faster than normal. Both of these issues are a concern for the Khmer farmer family stewarding the well-being of their cattle.

As a result of these dilemmas, preferring to transplant with narrower spacing (for higher straw output) is quite rational, given the need for fodder and especially when one has many cattle to feed. This type of behaviour is naturally viewed as irrational by field staffs, who often joke that, “people are growing straw not rice!” The usual response, which was the subject of one discussion in extension staff training, is that farmers can simply sell their “surplus” rice to buy fodder. This prospect faces two dilemmas. Firstly, after harvest the sale price of rice is low as is the price of straw, which has also been recently harvested. The price of these two commodities increases in parallel as the wet season approaches, such that there is no opportune time to exchange rice for straw. This is related to the second dilemma, which is that farmers still do prioritise their family’s rice needs above fodder needs and thus find it difficult to justify trading human food for cow food on a one-to-one basis. This is why, despite the suffering involved, they prefer to cut grass with a machete under the sun rather than give up rice. This is especially important for farmer families that do not produce enough rice annually for their own consumption, which represents 47% of the farmer families I interviewed.

The “survival algorithm” for cattle-rearing is similar to that for humans—even one year with a deficit of fodder must avoided at all costs, as it can initiate a cycle of debt and repayment, or, in the worst case, sale of a cow. This has profound implications for the willingness to adopt SRI. Because straw output is, *in theory*, not a problem for SRI, it is not generally mentioned as a potential risk during initial trainings.

Last year, CEDAC came many times to train people in SRI and luckily I could come to one meeting. I was very impressed. I raised my hand and said I would do SRI on half of my fields because I really believed their story. But why didn't they tell me

about the straw problem or the crabs? When I heard about these things from my sister, I decided only to test 10 ares [one eighth of her field]. (female, age 28, Samraung district)

Information concerning the decrease in straw output usually finds its way to potential adoptees through informal channels, especially rumours and reports from those who have tested SRI previously. More than half of the disadoptioners I spoke with commented that they encountered at least one unexpected issue with SRI that they were not informed about prior to the test. These issues include the difficulty with timing, vulnerability to certain pests (such as crabs), effort creating straight rows, and, most commonly, decreased straw output. For many of these respondents, these unanticipated experiences raised suspicions about the entire system and contributed to disadoption and additional rumour making. Consequently, the steep learning-curve for, and the rumours about, straw production are amongst the most salient reasons for disadoption and hesitant uptake of SRI.

Partially, the issue of straw production can be addressed by planning SRI cultivation incrementally and investing in alternative sources of fodder. But perhaps more importantly, it is necessary to admit that straw output is a potential problem with SRI, albeit solvable in the long-term, in all trainings and information sessions. Doing so can help create support for action research concerning how best to manage the straw dilemma. Unfortunately, even the newly-released training video, *Do you speak SRI?*, fails to mention this issue or address potential solutions to straw output and water management dilemmas.

The third structural constraint, lack of adequate resources for organic matter, is similarly a matter that can be addressed in the long-term given proper notice and preparation, but remains a potent barrier in the initial adoption and subsequent scaling-up of SRI cultivation. CEDAC has a conflicting relationship with the issue of organic fertilizer vs. inorganic fertilizer. One the one hand, CEDAC's commitment to ecological agriculture

implies that it does not support the use of inorganic fertilizers. On the other hand, CEDAC's commitment to diffusing SRI, which requires improvements to soil fertility, cannot often be accomplished with the resources initially available on most of its target families' farms.

Yes, I never know if I should say that it's okay to use fertilizer or not. I want the farmers to start learning about the environmental problems but I also want to make sure they get a good yield. If they start SRI on a field with really poor soil, the result might be disappointing if they don't use a little fertilizer, but it is against my training to recommend it. (field staff, Zone II)

There is an historical precedent here that I have already mentioned: emerging from the forced organic production of the Pol Pot era, Cambodian farmers embraced inorganic fertilizers with a vengeance. Over the past 20-25 years, fundamental soil fertility, which is based on replenishment of organic material, microbial activity and sustainable cultivation, has decreased across the board in Cambodia (Kingdom of Cambodia, 2000). Part of the reason is that inorganic fertilizers have replaced much of labour previously devoted to collecting organic fertilizer. Additionally, applying inorganic fertilizers (especially nitrogen) unsustainably amplifies soil decomposition (Bot & Benites, 2005). Another part of the reason is that land consolidation and agricultural intensification have created such population pressure in many lowland areas that the fertility of paddies has been progressively mined by over-tillage and dense, but not intensive,²⁶ cropping. In order to commence a System of Rice *Intensification* that improves productivity significantly, soil quality must recover rapidly.

The contradiction is that rebuilding soil fertility is a long-term process, whilst SRI adoption is expected to be a short-term process. Most farmers do not have the plant resources on their lands to begin rebuilding soil fertility in a meaningful way and have thus consigned

²⁶ By dense, I refer to the strategy of densely planting many seedlings to ostensibly shore up yield loss in small paddies, whereas intensification refers to the strategy of applying rigorous management practices.

themselves to the use of inorganic fertilizer and/or dense transplanting in order to produce an adequate yield of rice and straw. Breaking this cycle is challenging and requires a concerted effort over a number of years to improve the capacity of one's lands to produce organic matter. In the meantime, it may very well be necessary to continue relying on inorganic fertilizers to maintain food security. The problem for agricultural extension, much like with straw output, is that the messaging in training can be incomplete or confusing. Some farmers do come away understanding precisely which steps of SRI to apply, given their conditions. However, many farmers come away believing that SRI and inorganic fertilizers are incommensurate, or farmers are confounded by the high expectation that they could produce enough organic material to implement SRI effectively.

When people ask me if they can use fertilizers and do SRI at the same time, I always say to them: It's your field, so you can do what you want. I try to tell them that they are the expert, they know their fields better than anyone else. But so many people are confused! They think if they do not have enough compost that they cannot do SRI at all. (male, Village-Based Animator, age 35, Samraung district)

Because of the confusion about the role of inorganic fertilizers, and the lack of organic matter available initially on farmers' land, the relationship between SRI and fertilizers must be clearly communicated and strategies for the long-term improvement of soil fertility must be explicated. The first suggestion is difficult for CEDAC, as its opposition to chemical inputs is seen by the public as paired with the vigorous promotion of fertilizers and high-yielding varieties by the AusAID-funded Cambodian Agricultural Research and Development Institute (CARDI). The second suggestion, which involves trainings about how to increase nutrient recycling, will be difficult without significant action research exploring how to improve organic fertilizer resources in each village or regional agroecosystem.

4.1.6 Social Constraints to the Adoption of SRI

A number of social constraints to adoption have been mentioned in the above section; I will revisit some of these further and examine additional social constraints and their implications for SRI diffusion. Exploring these constraints and how they have been negotiated by CEDAC and farmers is critical for understanding how the institutional system for extension has evolved, and will evolve in the future. This analysis is based on the same premise as above: that, although the extension system and teaching pedagogy employed by CEDAC has been very effective relative to many other rural agricultural development projects in Cambodia, there are open questions as to whether these efforts are “effective enough” (to ultimately reach a large enough and vulnerable enough cross-section of the population) and whether CEDAC’s extension is improving in efficacy over time. Below, I will focus on a few representative topics concerning extension pedagogy and the perspective of strategic agents. The topics highlight how SRI, as key programmatic element, has come to be taken for granted and thus stagnated despite the fact that challenges to the extension model continue to accumulate.

Looking at field staff first, I found that many problems with extension pedagogy stem from the practice of privileging an internal *motivational functionality* rather than an external *accountability functionality*. Given limited resources for extension, CEDAC has adopted a strategy predicated on training a cadre of key farmers in each village to diffuse agricultural techniques. Under these conditions, it is natural to select the most enthusiastic and willing trainees, as these figures are more likely to be effective extension agents. In doing so, however, CEDAC not only escapes directly training the more hesitant farmers, but also misses the opportunity to learn about the constraints facing those farmers. As the director of research and development commented to me, “we tell our staff to ‘look to the potential’”, to

focus on, engage with, and learn from, successful participants and successful examples of their work, rather than dwelling on difficult or intractable issues.²⁷ Whilst this might generally appear to be a good operational strategy, it becomes problematic if it results in field staffs systematically escaping healthy confrontation with challenges to their model.

Surrounded by eager and encouraging Village-Based Animators, Interested Farmers, FA leaders and Community Field Assistants, field staffs naturally feel that progress is swift and communities are progressing rapidly. Whilst this has a strong motivational influence on field staffs, which cannot be underestimated when considering the challenges of human resource management in rural development, the over-exposure to a self-selected group of willing participants creates an artificial sense of achievement. Staffs are, in effect, preaching to the choir. This effect only becomes more pronounced over time, because as Farmer Community Schools become Farmers Associations, and FAs join with Commune Clusters, field staffs incrementally withdraw to higher levels of organisation, and resultantly come in contact with those who are even more enthusiastic than those at the village level.

Being disproportionately exposed to farmers who lack the structural constraints and shyness of the strategic actors paints a rosy picture of the landscape of SRI extension that, ironically, de-motivates field staffs to engage meaningfully with hesitant participants. By this logic, because so many families in Takeo, and indeed Cambodia, have succeeded nominally in applying SRI, it appears less and less rational for others not to apply. Because this occurs both at the level of the individual staff member and at the organisational level, CEDAC views overall have become less sympathetic to the challenges and constraints faced by strategic agents.

Farmers always complain about the same problems. But I have met so many other farmers who also have those problems but they managed to overcome them. If you

²⁷ Suon, 25 September 2007, personal communication

ask me, I think it is better to teach the farmers with a good attitude. Maybe later they will prove to the other farmers that the problems are not so hard to deal with. (field staff, Zone II)

Admittedly, it was surprising to me the first time I encountered two neighbours, one successfully applying SRI and another, not 100 metres away, blaming various structural constraints. In some cases, the neighbour's claims are justified and, in other cases, field staffs could argue that the neighbour was simply "making excuses". However, when "making excuses" becomes the overriding expectation, and ignoring hesitant farmers becomes the overriding practice, many real constraints facing strategic agents are not internalised. Describing a staff-training event at the headquarters, one field agent from Takeo described this logic in the following way:

We discussed or concluded that we cannot control the work ethic of the farmer. If s/he is a lazy farmer, than s/he won't do some of the extra or new things. If s/he is a hard-working farmer, it will be easier to teach. It is better for us to focus on these farmers. (field staff, Zone II)

Common amongst field staffs is the bipolar perception that farmers are either open or closed, and by extension, worthy or unworthy of attention. Infrequently was the farmer's degree of openness understood as lying on a continuum, despite the fact that openness is highly dependent on other factors. Indeed, openness to SRI is related with social and environmental factors that must be factored into an examination of adoption behaviour. By privileging the initially interested farmers, not only have the elderly, young and the 'strategic agents' often been marginalised from early efforts to disseminate SRI, but there are few plans to learn from

the dilemmas facing these groups and, thus, there is limited potential for their inclusion in the future.

From the perspective of farmers encountering CEDAC extension efforts for the first time, there is considerable dissonance about how to conceive of SRI and how to situate it within pre-existing social and environmental conditions. Prior to the arrival of CEDAC, it is untrue that farmers were unaware of improved management practices (see Maddocks, 1994), but they had thus far not chosen to implement intensification on a large scale. For example, many farmers grow or live nearby farmers who grow a premier variety of rice called *p'kah malis*. Although not strictly necessary, most farmers growing *p'kah malis* apply a more ‘intensive’ set of practices for cultivating this variety in order to match its ‘premier’ status. The fact that they do not apply the same resources to cultivating other varieties indicates that they have long-term reasons for not applying intensive practices on all of their fields. Many farmers expressed considerable hostility towards NGOs because they feel that NGOs unreasonably communicate the imperative to work harder on all of their field area (i.e., more intensive cultivation practices) without properly understanding structural constraints that have historically led to the current mixture of practices. To be fair, SRI differs from *p'kah malis* cultivation. Labour expenditure can be lower with SRI and some of the precepts of SRI cultivation are fundamentally different than any traditionally evolved intensification practices. Many farmers do find something new to learn, but their initial encounter with SRI can often be characterised with some antipathy because farmers feel they have already decided against intensification at the suggested scale.

In order to prove that SRI should be seen in different light than traditional intensification practices, farmers require forums for discussion (or gossip) and learning that are not always available. Although timing conflicts and difficulties announcing various formal training sessions invariably come into play, there are more intractable social barriers to attending meetings and interfacing with the local SRI community. Firstly, although

interest groups and Farmers Associations are open for membership, joining later comes at a slight risk of alienation. Secondly, there is no particular reason why anyone would necessarily enjoy the social experience of learning and doing business with one's neighbours. Indeed, there are many divisions and social boundaries that discourage certain groups or families from attending open meetings. Thirdly, many farmers are embarrassed to attend training sessions because doing so implies that their current skills are inadequate.

Following off the third point above, the question of how meaningfully farmers interact with the pedagogy of SRI extension is dependent upon how they construct their identity as a farmer. Farmers who feel well trained and prideful of their cultivation may see SRI as "the competition", and thus be resentful or at least highly suspicious of the new practices. Others may see their role as a farmer as requiring and welcoming innovation and change.

I am a farmer not an animal. Animals do everything the same each day, each year because they cannot learn. I want to improve my techniques and increase my yield.

Luckily, there are people I can learn new things from! (male, Farmers Association leader, 21 August 2007)

In addition to formal learning environments, gossip and critical masses are often very important in technology dissemination, and particularly so in SRI, because they decrease the pressure on each individual to adapt his or her identity as a farmer. This issue is addressed in the recently-released training and promotion video, *Do you speak SRI?*, which depicts a fictional young farmer's encounter with SRI. In the video, the main character rings the mobile phones of fellow farmers to gloat about his high rice yield, only to find out that their yields are higher than his and required less seed. The identity politics in the movie are significant: elder farmers teach a vulnerable and disappointed young farmer about SRI using

mobile phones, a magic television and animation. SRI is depicted as modern, but it is also applied by traditional (i.e., more elderly) farmers. The focus on identity politics of SRI is innovative, but approach and narratives were developed by a French production team, which consulted with CEDAC only for technical assistance and not storyline.²⁸

One final social constraint that has been weakly internalised by CEDAC concerns the “opportunity costs” SRI cultivation. Inherited from mainstream institutional discourse on rural development, CEDAC historically had a very static and sedentary view of development, although this is being reviewed. The locale is of primary importance, and “enabling people to stay at home” is an overriding concern (Bakewell, 2007). In fact, preventing migration and preserving beneficiaries as “small farming households” is an integral part of their mission (CEDAC, 2007a). In reality, migration, off-farm work, cottage industries and other social and economic aspirations are conspicuous elements of rural life. Indeed, 84% of sampled farmer families are engaged in work outside of the farm, 54% of families have at least two main occupations, and 46% of families have one member working a “high-paying” job.²⁹ Some of these occupations conflict or compete with SRI in various ways. I have already outlined how a large herd of cattle conflicts with SRI. In addition, alcohol and palm sugar production require large amounts of kindling and wood fuel that could otherwise be used for compost. The more intensive weeding, stricter water management and the degree of monitoring required can also make it difficult for the entire family to slip away to weddings and celebrations. Many other jobs can conflict as well if they tie up family labour, which is important (although not necessary) for SRI, in the cultivation season(s). CEDAC has recently begun classifying farmers based on their commitment to cultivation (as opposed to other jobs) and tailoring their strategies different, but it is unclear how, or if, this will affect SRI extension.

²⁸ The video was officially released 18 March 2008 in Phnom Penh. It was funded by Oxfam America and received logistical and technical support from CEDAC. The content of the video was produced by the firm Mind’s Eye Production.

²⁹ What constitutes a low, medium or high-paying job is outlined in Appendix 4. High-paying, however, is a relative term that exists only within the context of rural agriculturally-based communities.

4.1.7 Conclusion: How CEDAC arrived at its present state

In the preceding sections, I outlined a host of structural and social constraints in order to show how the extension practice and institutional culture of CEDAC has evolved in ways that have incrementally weakened SRI as an effective entry point to CEDAC's programming. Additionally, the manner in which CEDAC represents the outcomes of its work in 'impact assessments' does not allow for critical self-reflection. Through statistical analysis and a review of data presentation, I show that the absolute improvements overlook a relational (statistical) insignificance and mask over exogenous factors affecting rural Cambodia as a whole. I also show that increasingly distant involvement by staffs in organisations has resulted in a shift in accountability that increasingly favours a passive, demand-pull strategy for drawing in previously uninitiated farmers, rather than the grassroots approach favoured since the inception of rural development programming. This increasing distance from SRI, as I have argued above, is responsible for decreased motivation to deal with hesitant farmers and a declining capacity to conduct action research in order to make SRI a more inclusive entry-point. This conclusion is somewhat paradoxical, because whilst the technical aspects of SRI extension are receiving less and less focus at CEDAC, SRI continues to remain the blockbuster entry point for most other programmatic activities. Limiting the effectiveness of SRI extension limits the pool of potential participants—and clients—for CEDAC and, in the long-term, lowers the chance that CEDAC will become accountable to more vulnerable groups. Discussing why this is the case is the focus of the following section.

4.2 The Current Situation, Looking Forward

Although in the works for a number of years, following the celebration of its 10th anniversary, CEDAC officially kicked off a new and ambitious campaign to partially reform its activities to conform to business and performance guidelines. To hear it being discussed in meetings, one would get the feeling that the so-called “business plan” was a predestined and inevitable summation of CEDAC’s activities in the non-profit sector. Although nominally split into three “Core Programs”, only one of which is exclusively focussed on enterprise, a business-like performance orientation has permeated into all areas of programming (CEDAC, February 2008). As a result of these changes, CEDAC hopes to be 75% independent of donor funding by 2015.³⁰ It hopes to do so through a combination of “performance extension”, microcredit, marketing and stores, eco-tourism, export assistance and solar energy capacity building.³¹ By 2008, CEDAC already has eco-labelling and natural production networks for rice, palm, and chicken; it has two natural food restaurants open in Phnom Penh; and it has disseminated its business ethic to many rural partners, some of whom have begun developed producers groups and begun investing in co-operatively run stores and transportation capacity. In addition, following CEDAC’s new performance orientation, they field staffs have begun soliciting donations from villagers for the extension “services” they have rendered.

By internalising a performance orientation, CEDAC has fundamentally altered the incentive structures for field staffs and changed the way staff members view participating farmers. The president of CEDAC, Koma Yang Saing, frequently likens this new performance orientation to the type of business conducted by beer girls:

³⁰ The potential for reaching this goal of donor-independence may be reduced significantly if a \$2 million Gates Foundation grant is awarded to CEDAC and the Cornel International Institute for Food, Agriculture, and Development (CIIFAD).

³¹ Bao, 13 July 2007, personal communication

We are not like normal civil society here – we don't simply wait for a salary.

Business is not difficult to do. Even beer girls at night restaurants are doing some kind of business by collecting beer caps to help their salary. It's simple like that sometimes. We expect all of you to conscientiously fill out reports – this is like a bottle cap. You must prove that you did business. Why is it so difficult to get performance reports from some of you? This is not a communist regime, where you have to curry favour from the boss to increase your salary. In this regime, we have to present our performance to make our salary. All CEDAC staffs must understand this.

(field notes, 8 August 2007)³²

By distancing CEDAC from general “civil society”, Yang Saing diminishes the concerns of accountability and legitimacy usually applied to NGOs. Accountability is diminished because Socially Responsible Enterprises, despite their social orientation, are primarily accountable to their customers. The issue of legitimacy is evaded because instead of doing normative ‘development’ in the village, CEDAC is now doing neutral business.

Filling out reports to document “business transactions”, as described by Yang Saing, may threaten to objectify the participants as “clients”. Whilst staffs garner most of their personal feedback subjectively from day-to-day encounters, report-writing can slowly alter the nature of this experience. Over time, a reciprocal relationship between official reporting requirements and one’s individual outlook builds. Staffs’ subjective views become incrementally coloured by their exposure to impact assessment methodology and formulaic report-writing (Desai, 2006: 178). One begins to “see” through reports more and more (Scott, 1998: 24). For example, one master’s thesis written by a programme manager after a few years of working at CEDAC reads like a long-term programme impact assessment rather than an academic piece. Through my archival research in Zone II, I also discovered that

³² In case it is not clear from the description, waitresses can make a side-income by collecting the crown caps from beer bottles of various brands and returning them to the company as proof of sale.

many field staffs have decoded the underlying demands of the CEDAC report monitoring system. In their field reports, they recycle the same successful key words and ideas to manipulate the representation of their work in the field (Desai, 2006: 177). Some of this redundancy is also caused by the burden of report writing, which forces field staffs to adopt economising strategies for report-writing. This burden is likely to increase in the future because the central research and development unit disbanded at the conclusion of 2007³³ and now more numerous programme-level impact evaluations are replacing the centralised system.

Adopting a performance orientation inevitably involves trade-offs. It can “go right” when it increases efficiency, allows for rapid growth and diffusion of benefits, profits all of the stakeholders and remains ecologically sustainable. It can “go wrong” if it creates perverse or artificial incentives for participation, brings about report-writing and data gathering procedures that obscure rather than make assessment transparent, and fails to draw in a wider constituency and spread the benefits of development.

There are many positive results of this change already apparent in the field. Follow-up in March 2008 (nine months after initial fieldwork) demonstrated that many CEDAC staffs have become quickly converted to enterprise experts, and Farmers Associations have become very enthusiastic about the investment, marketing and other enterprise initiatives provided by CEDAC.

When I work at CEDAC, sometimes I work as a ‘businessman’ and sometimes as a ‘development practitioner’. But when I think about being a businessman, I realize I have more motivation and capacity to work. (field staff, meeting in Phnom Penh)

³³ This resignation of the director of the research and development unit was rather controversial at the time. The director claims that research funding was being systematically diverted and impact evaluations, which were outside of his purview, were being disproportionately supported.

Although grudgingly, there is a growing acceptance and understanding for CEDAC's "pay for services" model of training and assistance. This strategy also challenges the predominating expectation for handouts associated with classic *angkah* charity organisations. In fact, some farmer families who had previously been uninvolved in CEDAC's organisational activities joined in order to take part in the new business opportunities. More broadly, technical knowledge about organic standards and legislation are being more quickly consolidated in Cambodia, which can help prevent an erosion of standards as large agriculture concerns become interested in the natural sector (CEDAC, 2007b).³⁴

There are also many negative outcomes of the shift to a performance orientation. The primary problem stems from the fact that "enterprise" becomes the highest tier of organisational activity and thus depends on the stability of the organisational structures "below" it. After evolving through Farmer Community Schools, Farmers Associations and Commune Clusters, business and enterprise are seen as the next steps. Farmers must be "groomed" for the CEDAC system in order to make them ideal partners within the framework of the national level business plan. To become partners, farmers and farmer groups must traverse the track laid by CEDAC, which involves following of the organisational evolution described above. As a result, Farmers Associations, which were originally conceived of as forums for community empowerment (Mishra et al., 2006) also serve as channels leading towards engagement in specific CEDAC-coordinated activities further down the line (Wright, 1994).

I argue that FAs, whilst theoretically open forums, are controlled by a hegemonic relationship with CEDAC. The programme director in Zone II commented to me that FAs are empowerment-oriented because CEDAC only sets up the structures for farmer-to-farmer extension and then leaves the fate of the FA in the hands of its members. Indeed, members do share agricultural knowledge, learn how to work together to develop statutes, elect leaders

³⁴ Corroborated by Or, 17 July 2007 2007, personal communication

and discuss important issues facing their village. Occasionally, the FA succeeds in providing a forum for empowering village residents.

After CEDAC there was some solidarity and cooperation amongst people in the villages that we never saw before. People convinced each other not to burn the rice stubble. In addition, the infrastructure was improved by our own mobilisation. We managed to build a road together. In the evenings, when people were finished with work they would come and we would put on [karaoke] music and lights so people could work after sunset. In this way, we finished the road and started on another road. (male Commune Cluster treasurer, age 51, Tramkok district)

More commonly, however, the formal activities and structures of the FA are generally those prescribed by CEDAC field staff. For instance, all Farmers Associations adopt more-or-less the same governing structure and most FAs feature the same interest groups and microcredit activities. Moreover, FAs often lack non-traditional features and creative initiatives, like wedding assistance programmes, equipment rental, voluntary guidelines for cattle grazing and village newspapers. FA members suggested all of these activities to me but felt that the restrictive atmosphere made it uncomfortable for them to introduce such new activities to the FA. Although there is nothing formally preventing FAs from becoming entirely farmer-conceived, there exists a perception that the scope of activities viable for the FA is delimited in nature, especially as enterprise ideas are promoted to the FAs.

A few years ago, my son-in-law said he just wanted to try SRI. The next year, he joined the Farmers Association. The next year he was the treasurer and then he joined the Commune Cluster committee. Next year he wants to do business with

CEDAC. I think many people in this village followed this path. I guess I missed out.

(male, age 53, Tramkok district)

No, advocacy is not the point of this meeting. It is to organize activities of CEDAC with the committee. Maybe they have another group with the village chief to discuss advocacy, but not in the Farmers Association. (male CEDAC field staff, in Samraung district)

Before today, I did not even think about doing business but now CEDAC has made it clear that this will help us survive without being dependent on donors. But we understand this poorly, so we need CEDAC's guidance. Just look at how many good ideas they brought us for helping with the brown plant hopper infestation. We need to follow their good ideas. (male, Commune Cluster committee member, age 50, Samraung district)

Farmers Associations can thus be seen as training grounds, in which “participatory” techniques are used to produce potential rural partners for CEDAC. The FAs become, in other words, a pool of groomed candidates from which CEDAC can recruit into other activities. As a result of the strict track for group formation and the growing demands for business associations with rural people, there is little room for altering the foundational organisational structures influencing accountability of CEDAC to more vulnerable groups.

5.0 CONCLUSIONS AND DISCUSSION

Evidence presented here concerning SRI adoption, group formation and organisational evolution are intended to reveal the development apparatus of CEDAC as an *actor-world* engaged in translation (i.e. “network building”) in order to expand the scope of its actor-world rather than to accomplish any particular goal, such as sustainable development. Indeed, the concept of sustainability is self-referenced; it is constantly redefined, usually in an additive manner, in order to portray organisational evolution simply as strategic re-targeting of resources in order to better achieve sustainable development (Adams, 1995: 87). Originally defined as ecological and productive improvement in rice-based agriculture in Cambodia, sustainable development has been refashioned as the building of formal, often market-based networks of producers coordinated by CEDAC. Improving rural livelihoods has thus become a by-product of system expansion rather than an activity unto itself. The shift in accountability arising from the declining importance of agricultural extension is symptomatic of an organisation seeing the betterment of livelihoods as constitutive of *its own* performance, rather than a moral goal. This is not to say that CEDAC wishes to have less participation in its programming, but to acknowledge that, in focusing on *its* performance, the outreach system has less incentive to reach each marginal recruit, whose cost of recruitment is progressively elevated by structural and social constraints. Farmers facing social and structural constraints are informally seen as “difficult” in order to justify the inability and unwillingness to address their issues. Whilst the cost of recruitment and, by extension, the cost of increased accountability, can be reduced by addressing the social and structural constraints I have outlined, I show that the growing rigidity of the organisational apparatus as it evolves makes CEDAC increasingly unable to accommodate the adaptation necessary to do so. In addition to organisational rigidity, the willingness to adapt to

constraints affecting accountability is hampered by the *punctualisation* of the CEDAC actor-world over the past 10 years. The operating parameters of CEDAC in the early years, which included action research and sensitivity to rural constraints, are increasingly crowded out or viewed as an uneconomical regression to “old” functionality in light of the new performance orientation. Impact assessments and report-writing culture further serve to obscure the past and prevent critical and reflexive analysis about where CEDAC is going. The new imperative emerging from the performance orientation is to ensure that extension (i.e., recruitment) is “effective enough” to provisionally maintain donor-funding and to supply the CEDAC actor-world with sufficient and readily-drafted new recruits. It is clear from CEDAC’s relative success with SRI extension and group formation that numerically it has a strong positive influence, but these figures obscure important exogenous factors and many relative untruths about its influence in rural communities. It is my conclusion then, that CEDAC is a recent convert to the growing community of developmentalist-oriented organisations that have converged upon the reformist ‘market sustainability’ paradigm of sustainable development (Adams, 1995). Whilst critiquing this paradigm is not within the scope of this work, in *Prospects* I shall conclude with a brief discussion of the prospects for this paradigm to challenge traditional industrialist modes of agricultural development or fall in line with it.

The first issue to address in detail is the evolving definition of sustainable development, which is used rather instrumentally to assert the necessity of current activities and to incrementally justify expansion into further activities. Although CEDAC’s vision statement, which focuses on increasing rural incomes, ecological sustainability and social cooperation is fixed (CEDAC, 2007a), there is an unspoken definition of sustainable development that lays out what must be done in order to achieve the vision statement. And whilst this definition can be altered, it is generally augmented, or added on to, by viewing new activities as essential supplements in the pursuit of achieving the vision statement. In

this way, the focus on SRI diffusion has been incrementally extended to include Farmers Associations, Commune Clusters and now business activities. Within actor-network theory this process has been coined *Problematisation*, because it involves the guided expansion of an actor-world through continuous redefinition of what problems must be solved.

I focus on SRI in this thesis because it is the original product of *Problematisation*, and has since become a gatekeeper through which all other activities must flow and is thus a critical element of accountability. For most farmers, learning SRI is the first step in becoming a full-fledged member of the CEDAC system, which can variously include ecological livestock raising, village microcredit, social interest groups, producers groups, farmer-to-farmer extension, and business-related activities. The inability or unwillingness to take up SRI generally pre-empts a farmer from taking part in all of these other activities, thus making SRI an ‘obligatory point of passage’ (Callon, 1986a: 26-27). I gave considerable attention to the structural and social constraints which mediate whether or not a farmer family is able to pass the SRI-gatekeeper because these constraints effectively predict whether or not a farmer will (be able to) join the wider CEDAC system.³⁵ I thoroughly deconstructed these adoption constraints in order to determine whether there is some rationale behind who “gets through” and who does not. I concluded that, given CEDAC’s historical ability to solve constraints, as seen by its historical record of effective action research in agriculture, CEDAC has allowed these adoption constraints to persist because they passively select suitable partners. In other words, the constraints are a natural filter or screen, determining which farmers are worth working with (i.e., easily recruited and willing to take part the broader CEDAC system) and which farmers are unworthy (i.e., costly to include and potentially unenthusiastic about further engagement in organisational activities). This “unworthy” group is defined within CEDAC’s informal typology as the “difficult group”,³⁶ which are farmers

³⁵ To pre-empt any direct criticism here, I should point out that there are always exceptions—non-SRI farmers who join Farmers Associations and also SRI-farmers who do not join Farmers Associations. In generally, however, the presence of these individuals does not upset my overall conclusion.

³⁶ Yi, 21 September 2007, personal communication

who are rather neutrally considered by CEDAC as ‘beyond their ability’ to include. The “worthy” group, conversely, is seen approvingly as the “pioneers”. A third group, the “wait-and-sees”, includes farmers who have simply not yet joined the pioneers or the difficult group. My analysis of the social and structural constraints shows that, contrary to this typology, there is a large group of “strategic agents” which includes many wait-and-sees and “difficult” group members, who have engaged with SRI and found it wanting, or face considerable real constraints. The broader question for accountability is: should these strategic agents be left out of the larger CEDAC system as well as SRI cultivation?

I realise that discussing the rationales and motivations of CEDAC as a unitary entity is somewhat artificial and have thus also sought in this thesis to explore how CEDAC staffs, individually and in aggregate, contribute to the larger processes described above. I conclude that membership in the ever-growing actor-world of CEDAC requires staffs to be constantly engaged in activities that distance them from strategic agents, and thus limit their ability to see and act upon challenges to accountability. There are three main activities that bring this about. Firstly, the imperative to upgrade their target villages to higher and higher levels of organisational activity draws them away from the hesitant and constrained villagers. Secondly, the constant demand to advance themselves (i.e., their human capital) to serve the emerging interests of CEDAC’s social organising and business elements distances them from their original specialisation in agricultural extension and action research. And thirdly, there are increasing demands on staffs to represent their work in a synthetic ‘impact assessment’ format, which creates a competing, and increasingly dominant, lens through which to “see” farmers. Described within actor-network theory is the concept of *displacement*, which describes how the ‘buzz’ of roles, activities and documentation distracts those within an actor-world from engaging in self-reflexive assessment (Latour, 2005: 59-62). CEDAC staffs are so pre-occupied with the structural imperatives of their work and the adaptation required to maintain their position that only the horizon remains in view. In this case, *displacement*-

activities provide for the progressive expansion of the CEDAC actor-world by securing focus on future activities at the cost of the past. Adaptive rural programming and action research, once prominent features of CEDAC's activities for broadening the access of agricultural innovations such as SRI to more people, are subtly supplanted by the operational necessities of the business plan.

The incremental convergence upon a market sustainability and performance-oriented model for sustainable development presents many risks and opportunities for an organisation such as CEDAC. The way in which CEDAC responds and adapts to the challenges and constraints of this new operational paradigm are broadly instructive for analysing and guiding the evolution of many other promising sustainability initiatives that may yet go down this path. CEDAC has already shown remarkable capability to succeed within the new performance-oriented framework, as shown by the rising sales of organic products, increasingly entrepreneurial cadre of farmer families and governmental support for marketing initiatives. But these successes have also arrived with significant tradeoffs in its accountability and its declining ability to sensitively document the experiences of its current participants and solve the constraints of its potential participants. As CEDAC continues to differentiate and grow, the newest activities and focuses gain in priority and, to the extent that the new activities require a consistent organisational foundation on which to operate, the activities of the past become more marginalised and more crystallised. The assumption emerges that as long as the new activities (the business plan, performance orientation) are moving forward and donors are continually attracted, past activities will be "dragged forward" with the new. In contrary, I have documented a large and increasing distance between the achievements of CEDAC under its new operational paradigm and its achievements under the previous paradigm. CEDAC's focus on its *own* achievements and not on those of the rural people who make its success possible highlights the limited degree to

which rural livelihoods and poverty reduction can accountably be addressed with market-sustainability based development activities.

5.1 Prospects and Research Recommendations

In this section, I would like to address very briefly two burning issues implied by the conclusions of this thesis. The first issue concerns whether CEDAC can take control of this situation by revitalizing its inclusiveness and accountability within the current operating framework. The second issue is concerned with the prospects for a market-sustainability model such as CEDAC's to supplant the industrialist modes of production and consumption inherent to the capitalist market system.

My discussions with upper-level management at CEDAC have indicated that whilst management is aware of the lapse in focus on adaptive agricultural extension, they feel as if they are on treadmill that prevents them for revisiting old issues. Rather, they hoped that the dilemmas I raised could be solved with new projects. Management all the way down to field staffs are aware of the structural constraints and many of the social constraints that I have outlined but are themselves constrained by time and the imperatives of their new activities. In discussion, the programme manager in Zone II, agreed overwhelmingly that revisiting strategic actors' experiences and resuming action research would be an ideal way to address their accountability concerns, but did not offer any plans for this.³⁷ The president of CEDAC pins the hopes for improved accountability in the long-term on their new young trainees from the countryside (so-called RDTs) who can act as embedded extension agents in accessible villages as well as in the hinterlands.³⁸ Whilst these two initiatives may facilitate diffusion of SRI and ecological livestock raising techniques to strategic agents on the margin, these ideas still do not address the widening gap between staffs and farmers and the lack of action

³⁷ Yi, 17 March 2008, personal communication

³⁸ Yang Saing, 24 September 2007, personal communication

research for solving adoption constraints. It is still an open question whether the CEDAC system, like Fairtrade, can hope to challenge the underlying social relations of capitalist production inherent in the adoption of a performance orientation (Friddel, 2006; Meiksins Wood, 1997).

In regards to whether models for sustainable development such as CEDAC's can compete with the whims of industrial agricultural concerns and modern consumption patterns, there is much evidence that Cambodia is making remarkable headway in this respect. The domestic demand for natural and organic products is high for a poor country and continues to grow, and CEDAC has shown that there is little difficulty transitioning from "traditional" to "organic" production. Although it is yet unknown why, natural and traditional products resonate very strongly for Cambodian urbanites; CEDAC's president has commented to me that Cambodian people have picked up the ideas of 'organic' faster than in Thailand and Vietnam. He envisions Cambodia entirely skipping the phase of "modern" consumption and moving directly to postmodern consumption—something akin to what has happened in small progressive niches in the Global North. However, it is well-documented that agro concerns and the research agenda set by agronomists often pre-empt novel forms of agricultural production from emerging with the proper support (Uquillas, 1994). The "open market" can be ruthless to emerging market forms. Seed peddlers, livestock traders, and fertilizer and pesticide companies are hegemonic forces in development and have many tools at their disposal to disrupt or co-opt the slow process of niche branching that often perpetuates alternative agricultural production and consumption patterns. Brazil's aggressive marketing of surplus pesticides and the precipitous decline in the Cambodian pork market due to competition from Vietnam are examples of the vulnerability of alternative markets.

Appendix 1 – Research Methods and Methodology

1.0 INTRODUCTION

The methodological demands of conducting an empirical and ethnographic study concerning sustainable agricultural development are considerable, given the need to merge multinational discourse analysis with organisational ethnography and embedded farm-level fieldwork. Historically, studies of this nature have simply narrowed their methodological lens by focussing on either positivist assessments of specific rural livelihood dimensions or on a contextually-situated, anthropological approach (see contrasting styles in these works: Brosius et al., 1986; Marten, 1986; Prill-Brett, 1986; Uphoff, 2002c). The methods employed for this study are intended to bridge this divide. I collected hard data when it seemed to reliably reflect conditions and otherwise employed mixed qualitative methods, including semi-structured and open interviews, as well as probing archival research. This set of priorities is not without precedent however, as much of the contemporary research within the emerging field of agroecology has the stated goal of integrating well-worn agronomical (often statistical) methods with ethnographic evidence. The feedback from this research methodology has reverberated back to agronomy, where assessments have increasingly come to embrace concepts such as total factor productivity and “local culture” (Dawe & Doberman, 1998). Adaptive methods are even more necessary in studies of sustainable agriculture, as paradigms for extension and assessment are more complicated, rapidly changing, often experimental (Bamberger, 2000). It is with these concerns in mind, as well as the intention to study “through” the NGO, that I developed a hybrid qualitative and quantitative assessment methodology based nominally on the ‘sustainable livelihoods’ framework used by the target NGO. There is also the growing awareness that there exist important relationships of power between the researcher and the researched, and between various targets of research, and that

these power dynamics must be self-consciously factored into fieldwork plans (Rose, 1997).

Where I depart from a ‘sustainable livelihoods’ perspective, then, is in the application of actor network theory to accommodate the increased focus on the role of power and discourse of non-governmental organisations in agricultural extension and the ideological moulding of sustainable development. In the following, I will describe the theoretical and practical rationale for each methodological tool, making reference to their relevance within the framework of ‘sustainable livelihoods’ or actor-network theory.

2.0 WHO, WHAT, WHEN, WHERE AND WHY?

Foremost, this is a study of rural farmers in Cambodia and their interactions with the larger world of sustainable agricultural development, as mediated by the Cambodian Center for Study and Development in Agriculture (CEDAC). The primary concern, then, is elucidating the farmers’ experiences with agricultural change and the concomitant institutional dynamics contributing to that change. The immediate dilemma becomes: which farmers’ experiences are representative, and illustrative, of this change, and which subsection of CEDAC’s programming would demonstrate the range of outcomes and institutional ideas connected to broader ideas concerning sustainable agricultural development? I had two additional selection priorities: to focus on areas particularly targeted for extension of the System of Rice Intensification (SRI, one of the low external input cultivation schemes becoming popular within the field of sustainable agriculture) and to choose an area with “typical” lowland, rain-fed paddy agriculture, as this agroecological system is the most representative of Cambodia and many other paddy rice growing areas in the world. I also decided to allow CEDAC to “put its best foot forward” by electing to study in Zone II, which is mostly comprised of Takeo province, and includes the villages and

programmes that CEDAC is the most proud of, and has been most successful in.³⁹ However, because CEDAC's penetration into villages in this Zone is uneven, a randomised sample of villages in which CEDAC works enabled me to mitigate some (but not all) of the potential internal selection bias. I further mitigated this by randomly selecting amongst landed households within each village using the most recent list kept by the village chief. Before embarking on interviews, I invited the coordinator of Zone II to review the lists and offer any criticism as to its fairness and representativeness; he had none. I thus became based out of Angtasaom, a byway town in Takeo province that contains the Zone II headquarters.

The decision about where and with whom to conduct the study was strongly influenced by my preconception that CEDAC—and its programmes—were promising, unique and thus merited closer scrutiny. The literatures on sustainable agriculture and rural development are not rife with examples of success, and I wished to explore a case that many people in Cambodia consider uniquely successful. This partiality also drew me to Zone II, as the flagship example of CEDAC's success. But after satisfying these personal preferences for location—the prerogatives of the academic one could say—I resigned to following the strictest quantitative measures (i.e., randomisation) for objectively selecting which villages and which villagers to study. Root (1993: 243) points out that, in many cases, it is preferable to acknowledge one's “conscious partiality” rather than develop artificial ‘value-free’ justifications for one's methodological decisions. Rubin and Rubin (2005) also remark that attempting to be neutral or dispassionate about one's interests can be problematic because one cannot empathise with interviewees. In this case, I empathised with the farmers' situation from the outset, as they were the primary subjects of study, but also with the work of CEDAC, which I respected enough to study about in the first place.

³⁹ Zone II might be considered the flagship region for CEDAC, as most international NGOs, foreign dignitaries, and Cambodian politicians are toured through this area. Indeed, on the occasion of the organisation's 10th anniversary celebration, a large majority of participating farmers invited from project areas were from Zone II. In addition, much of CEDAC's own data suggesting the success of its programmes originates disproportionately from Zone II.

Whilst farmer household interviews represented the core livelihood structure around which I studied other aspects of sustainability and institutional discourse, there were four additional sources of information that I drew upon: archival records from Zone II, interviews with CEDAC staffs at all levels in the organisational hierarchy, attendance at rural meetings and participation in CEDAC workshops. The choice to investigate these avenues was based on my interpretation of the sustainable livelihoods framework, which focuses the *contexts of livelihoods* (policy setting, history, agroecology, socio-economic conditions), including which combination of *livelihood resources* (human, physical, and social capital) result in the capability to follow various *livelihood strategies* (new cultivation practices, diversification, migration, etc.) and to what extent these strategies produce *sustainable outcomes* (Scoones, 1998). Observing meetings of Farmers Associations, Commune Cluster committees, and town hall meetings called by local politicians was critical for understanding the way in which the local social context was being influenced by NGO efforts. Participating in CEDAC workshops for staffs and farmers allowed me to gain access to the pedagogical style, participatory practices, extension paradigms and the institutional dynamics, goals, and struggles of CEDAC. Archival research, in turn, provided a unique historical window into the fast-changing evolution of CEDAC, in addition to the history of successes and contradictions of project implementation in the villages I studied. Finally, interviews with CEDAC staffs ranging from the president to the newly-initiated trainees gave further insight into the broader ideological foundations and priorities of CEDAC, as well as the stark realities of carrying out the work of a grassroots NGO engaged in rural development. As a result of my significant exposure in interviews and at workshops, meetings, and social events during the course of the three-month period of fieldwork, there were, and are, constant questions of positionality and communication.

2.1 A Note on Positionality and Communication

The challenges in communicating and negotiating the power dynamics presented by a multi-part study on an organisation and on rural actors are immense. Foremost, communicating with farmers and most field staff necessitated employing an interpreter who could dynamically interact with a range of figures, stretching from high-level government officials to the most impoverished of farmers in the countryside. Although power asymmetries will exist despite my best efforts to reflexively and proactively deal with them, I spent considerable effort selecting, training and mindfully working with my interpreter (England, 1994). Although the pitfalls and problems with interpreters have been heavily discussed (Temple & Edwards, 2002), I had no other choice and thus sought ways to mitigate the problems, or even turn them into opportunities. My strategy was to seek out an interpreter who, most importantly, could connect with rural families and, at a minimum, maintain a clean and professional appearance during elite interviews whilst relying on my professional/academic status to narrow the power differential with interviewees. In the end, I selected a young university student who grew up in a farming family in the region in which we worked, but could assume a well-groomed and composed stature for interviews outside of the rural areas. I spent considerable time training my interpreter to have a large degree of autonomy in how we navigated through various topics and interviewee personalities. However, by virtue of my knowledge of Khmer, I could follow along and would intervene in the course of discussion as needed. The benefit of this strategy, in addition to giving my interpreter a sense of ownership over our work, was that our conversations were efficient and more engaging to the interviewees.⁴⁰ The drawback was that I likely overlooked some emotional cues and potential avenues of investigation.

⁴⁰ Given the everyday nature of the topic of rice cultivation for farmers, building an interview experience that did not cause interview-fatigue or antipathy towards the questions was of critical concern (Chapman, 2001).

Although my interpreter was the pillar of my attempts to adapt to the power dynamics inherent to our varied interview milieux, the requirements of studying “up, through, down, and over” an organisation necessitated negotiating positionality in many more direct ways (Wedel, 2004). Studying through involves exploring the source of policies being projected “down” (Shore & Wright, 1997). This entailed looking at the structures of CEDAC, including its bureaucratic culture, data gathering imperatives, development goals and donor relations (Escobar, 1995: 39). Studying up refers to interactions with elite figures (Nader, 1972). This meant being constantly aware of my position relative to interviewees and engaging in appropriate courtesy, such as business card trading, in order to establish rapport. I often had to consider whether I wished to be viewed as a professional student studying at an elite Western university (a position of high status) or being a modest and embedded anthropologist in the field (a position of relatively lower status). Particularly when “studying over”—interacting with mid-level CEDAC staffs—I wished to decrease my status and be more companionable (Markowitz, 2001). Sometimes I accomplished this too well. Occasionally, mid-level staffs viewed my work as being slanted towards the perspective of farmers, which they felt could often be misleading or simply mistaken. Our familiarity with CEDAC staff, in turn, created challenges for “studying down” to the community-level. Indeed, this often impinged on our ability to represent ourselves to farmers as independent students without an agenda other than research.⁴¹

Let me focus on the two most challenging concerns regarding positionality: being viewed by local people as staff member of CEDAC or another charity organisation, and being seen by CEDAC as either monolithically a friend or foe. As regards the latter, it is clear that CEDAC is an NGOs that is very interested in studying its own processes; discourses of reflexivity and independent research have suffused their organisational ideology (Mosse,

⁴¹ This is commonly referred to as the “insider/outsider dilemma” and refers particularly to the trade-off between proximity and privileged access to the NGO and the objectivity of a researcher (Beynon, 1988), (Mosse, 2005: 12). It is ultimately a dilemma, and not a problem, because it involves a strategic decision on the part of the researcher regarding how he or she prioritises data gathering.

2001: 165). Indeed, in one staff meeting, the president of CEDAC proposed welcoming researchers and foreigners to their countryside projects as a type of academic eco-tourism (field notes, 8 August 2007). However, there is a limit to CEDAC's reflexivity. In general, "development organizations which exist in a nexus of information, evaluation, and external funding – are, amongst other things, systems for the production and control of information" (Mosse, 2001: 176). My presence in the field and future publications could potentially cast negative light on CEDAC's programmes, and indeed suspicion of this was aroused by a miscommunication mid-way through fieldwork. Fortunately, the resulting discussions and negotiations regarding CEDAC's concerns laid the foundations for a far more trusting and mutually transparent research experience. In particular, I was driven to make inroads with mid-level CEDAC staffs in order to re-establish trust. This was unproblematic, and even enjoyable, as it was clear that we shared the same lifestyle: countryside work and urban existence. Many staff members thus became key informants for me.

Another challenging task was distancing myself from other development organisations during village visits. Farmers occasionally believed my interpreter was a CEDAC staff member and I was merely an observer, or they saw me as a representative of a charity organisation who was merely scouting the area for opportunities to "give". The fact that we were concerned with SRI, which is predominately linked to CEDAC, and that we focused on basic livelihood characteristics, which are typical concerns of charity organisations, it was occasionally challenging to communicate that we were "nothing more" than students. This problem was occasionally confirmed when villagers made use of various honorifics (such as "teacher" – *lo kru*) when referring to me, or petitioned for various gifts commonly distributed by NGOs (such as toilets, cattle, wells, etc.) Although my identity as a student usually became obvious due to the increasingly probing and analytical nature of the discussions, it clearly affected segments of my discussions with a number of interviewees. After the first few interviews, I was much more able to balance the need to elicit information

with the need to establish rapport and trust (Oakley, 1990). In many cases, I was openly playful (i.e., climbing trees, demonstrating my coconut-opening skills, gossiping in Khmer, etc.) in order to defuse tense interview situations.

3.0 DATA GATHERING AND METHODOLOGY

3.1 Wellbeing and Rice Cultivation: Empirical Valuation, Semi-Structured Substantiation

Based on prior experience in Cambodia (see Feuer, 2004) and consensus across disciplines and fields, I have chosen to empirically measure well-being using an asset-based livelihood assessment. To investigate the rice cultivation practices of each farmer household, I elected to carry out a hybrid survey allowing quantitative variables for each “practice”, whilst exploring the reasoning behind each one sequentially in a semi-structured interview fashion. In addition, I followed up each interview with an open-ended dialogue used to confirm responses, explore certain ideas more deeply, and discuss specific sub-themes, such as environmental awareness, family labour, group affiliation and aspirations. Between these three practices, I carried out 70 semi-structured and annotated survey-interviews with farmer households during the nursery and transplanting seasons (June – August 2007). Each survey required around 35 minutes of response time, which allowed 15 minutes for clarifications and 30 minutes of additional semi-structured and open-ended interviewing. A numerical list of formal farmer interviews can be found in **Appendix 5**.

In addition to quantitative scores, the Khmer survey instrument also included space for clarification and explication and for rationales and explanations. Indeed, sections describing the status of the family, their landholdings, and their access to water resources typically elicited long stories. The section outlining rice cultivation practices also includes

space for asking “why?” next to each practice. In addition to these direct survey prompts, questions themselves often led to various follow-up questions, which could be posed immediately or following the survey portion of the interview. This allowed for the interviewee to develop certain ideas that were important to them and gave me a sense of what issues to follow-up in the open-ended interview. In some cases, follow-up questions were also used to triangulate certain information, such as the rationales behind certain cultivation practices or information I could use to establish a more comprehensive picture of household productivity (Alrøe & Kristensen, 2002).⁴² There were also more specific sub-themes that I generally tried to touch upon in a semi-structured manner if the topic was appropriate for the household, such as labour, group affiliation, ecological literacy and family cultivation history. Most often, however, follow-up was based on specific issues raised by the respondent(s) or provoked by a certain answer to a survey question.

3.2 Open-Ended Interviews and Archival Research: Actors and Networks

Because the core topic around which this thesis revolves is the socio-technical models for agriculture and the extension of the System of Rice Intensification, it is particularly suited to the material-semiotic constructivist lens of actor-network theory (ANT). Developed in the works of Michael Callon, Bruno Latour, and John Law, ANT presents a set of theoretical tools for understanding the interactions of actors and nonhuman entities (such as agricultural cultivation systems) by seamlessly reconciling the semiotic and material exchanges occurring at the intersection of institutional practice, agroecological system, and rural livelihoods. Central to the understanding of ANT is the concept of ‘translation’, which is a mode of mutual collaboration between actors within an actor-world that enables the actor-world to persist and be continually reinforced. For the sake of this thesis, that actor-world is the

⁴² Total factor productivity, in the context of rice cultivation, is a metric theoretically intended to consider many additional inputs in a non-linear fashion, including machinery, fertilizer, pesticides, weather, and child labour (Dawe and Doberman, 1998).

narrowly-prescribed vision of sustainable agriculture and rural development emanating from CEDAC, and that includes non-human actors such as SRI, as well as CEDAC staffs, farmers and rural participants, Cambodian politicians and the interested international agricultural research community.

The methodological issues arising from a conceptual understanding based on actor-network theory are typically concerned with unpacking the mechanics of an actor-world that has, over time, obscured its past. In actor-network theory, *punctualisation* refers to the active and passive processes which allow past functionality and concerns to become invisible in order to better focus on the horizon (Latour, 1987). The task of the researcher is to focus on the topics that help elucidate how and why changes to rural development projects and development mentality have arisen. To that end, I interviewed actors from across the organisational spectrum and pored through archives containing history of a less mature actor-world.

3.2.1 Open-Ended Interviews

Many of my purely open-ended interviews took place toward the end of fieldwork, as I was then more prepared to discuss authoritatively and analytically the issues emerging from farmer family interviews and my experiences in the field. Indeed, my interview with the president of CEDAC occurred the evening before my departure from Cambodia, when I could speak holistically and in general terms with an elite strategist and privileged source of historical and discursive knowledge of the domain of sustainable agricultural development in Cambodia. This strategy served me very well, as my accumulated knowledge of the intricacies of CEDAC's agricultural extension system led me to the most salient and relevant questions (Lockwood, 1992: 170). Informants also included specialists in certain areas of CEDAC, such as local organising, farmer training and extension, and research. In order to

understand the routine mechanics in CEDAC, I also interviewed with many mid-level staffs, and particularly those working in and around my regions. Many of these people were friends as well as informants and these ‘after hours’ relationships often transgressed from ‘interviews’ to participant observation (Gellner & Hirsch, 2001), which facilitated access to the mundane, but otherwise important day-to-day activities of CEDAC staffs. Open-ended interviews also took place with local village leaders, national and local politicians, charismatic individuals such as famous SRI farmers or women leaders and staffs from international NGOs. Functionally, many of these interviews outside the countryside were carried out in English (with minimal intervention by my interpreter) and many were ongoing conversations throughout the last month with no discrete interview scheduled. A numerical list of open-ended interviews can be found in **Appendix 5**.

3.2.2 Archival Research

Like many such collections, the CEDAC archives include a measure of organised and well-maintained set of official documents, routine reports and donor updates in addition to a measure of messy and unsorted equivalents. And probably like many such researchers, I was the first to unearth many of these documents since they were filed away. My general strategy, given the immensity of the task, was to work from the present to the past, most relevant to least relevant. Thus I began by translating and analysing the most recent documents concerning the villages included in my study. Determining relevance was a question of linking documents to informants or acquaintances in the field, or reading documents prepared by CEDAC staffs whose work and/or personalities were familiar to me. In many cases, I presented specific documents to staffs as ‘nostalgic memorabilia’, which often elicited excited discussions of the particular training session or meeting in question. Whilst serving as examples of how the past is officially represented, or made ‘legible’ by

staffs (Scott, 1998: 24), many documents were indispensable in cuing forgotten memories and leading towards discussions about how things have changed over the years. This was invaluable in reconstructing an historical narrative (i.e., opening the ‘black box’) concerning extension work and the evolving nature of official discourses on sustainable agriculture and rural development (Nauta, 2006).

4.0 ETHICAL CONSIDERATIONS

The study concerns a period of profound social and ecological change in rural Cambodia that is being mediated by institutional processes and, to a large degree, by changes in the global discourse concerning sustainability and rural development. The broader ethical concern for me stems from my own concerns about ecological sustainability, and how research should buttress the legitimacy of the environmental movement whilst trying to remain objectively critical and analytical in nature (Root, 1993: 243; Rose, 1997). This broader ethical concern is complemented by many direct ethical dilemmas inherent in the study of organisations, and in the interviewing of elites and vulnerable respondents.

4.1 Accessing and Interviewing Farmers and Rural Figures

Negotiating access to a Cambodian village is generally unproblematic, but one does have to pass a gatekeeper—usually the village chief. It is not uncommon for village chiefs to direct much of the benefits from external sources (such as development NGOs) to those closer into his kinship network. As a student with no obvious gifts, I avoided this potential problem. Indeed, when I presented a pre-printed randomised number list for selecting villagers, most village chiefs became instantly at ease knowing that I was not choosing any

particular families over others. In most cases, the village chief informally communicated with the families who had been selected, which forewarned them, in a general sense, that a foreign student interested in their family and agriculture would stop by within the next few months. Village chiefs often became an invaluable source of directions and advice concerning village politics and upcoming events and meetings. Out of custom, and my own sense of gratitude for the immense assistance provided me, I sponsored modest celebrations with a few particularly helpful village chiefs and provided farewell gifts (usually photographs) at the conclusion of fieldwork.

To a degree, the researcher in the Cambodian countryside is operating under constraints that preclude a polite and pre-arranged visitation. Communication in rural areas is difficult, and scheduling interviews is logically problematic. Fortunately, local customs regarding hospitality to spontaneous strangers and the general curiosity about white foreigners allows for a rather comfortable unannounced visit. My interpreter and I always introduced ourselves, explained, in general terms, our purpose in the countryside and quickly clarified how we received the family's name (randomly from the village chief's roster). We would then ask if the respondent(s) could be bothered for a bit more than an hour of their time. In this way, we would usually be invited to have a seat. Before proceeding with anything more research-related than idle chatter, we would seek oral confirmation of informed consent and describe how their responses would be anonymous⁴³ and contribute to the publication of a "book" about agriculture in Cambodia. If the respondent(s) agreed, we would begin the interview with a census of the family, which was always an enjoyable and comfortable transition into the topics of household assets and rice-cultivation practices. At the conclusion of the interview, consent would be re-confirmed and then the primary respondent would be asked to sign the consent form if they were comfortable doing so. This allowed multiple chances to deal deliberately with the issue of informed consent (Gellner &

⁴³ In this thesis, pseudonyms are used for all farmer interviewees and for CEDAC field staffs in order to protect them from any recriminations that might result from the publication of this thesis.

Hirsch, 2001: 5). If the respondent felt that something compromising had emerged during the discussion, he or she had the option to take the survey and either destroy it or keep it. This occurred only in one instance. As a token of appreciation, and polite Cambodian gesture, I always presented the primary respondent with a small Cambodian scarf (*kromah*). I chose this gift because it is unlikely to cause jealousy amongst villagers due to its ubiquity in Cambodian society at all levels.

4.2 Access and Representation in Organisations

Two particularly salient issues mediated my experience studying about CEDAC: access to organisational facilities (including archives) and staffs, and the larger question of how to represent CEDAC textually in the thesis. Gaining access and receiving widespread consent for interviewing were unproblematic. My initial contact with CEDAC was through the former director for research and development, who enthusiastically helped organise my potential fieldwork site and, more generally, set the stage for a very open and hospitable study experience. Historically, CEDAC has had considerable experience hosting students, as well as journalists, international academics, and high-level politicians. My overall impression is that they are proud of their work and thus very confident about their outward representation. I asked and was told early on that I had permission to speak with any members of the staff, but that I should respect their wishes regarding use of information and anonymity if the issue arose. Elite interviews were particularly unproblematic in this respect, as the figures I spoke with were quite accustomed to speaking with any type of interviewer (Shore, 2002). Mid-level staffs at CEDAC shared a friendly relationship with me, but for the sake of their job security often requested anonymity. In part, this was because much of the information I gained from mid-level staffs was usually ‘after hours’, spontaneous, and usually observational in nature.

Whilst accessing respondents was relatively unproblematic, the question of how I might represent their observations and conclusions did draw some concern during the fieldwork period. Although I believe that CEDAC would willingly accept honest and well-formed criticism, they are justifiably concerned about their work being “misunderstood”. A farmer who could be seen as having “disadopted SRI” by a researcher might be seen by staffers as simply having “scaled down” SRI. A village struggling to take up SRI might be viewed by an outside researcher as a problem with agricultural extension, whereas CEDAC management and staffs might see the same situation as a work-in-progress or a project that simply has not yet borne fruit. Indeed, one of CEDAC’s mottos is: “we learn by doing”.⁴⁴ In these conditions, “success” or “failure” is not defined in such strict terms (Crewe & Harrison, 1998). In particular, the time-frame used to determine success is often seen as infinite (i.e., there are no failures, there are only projects that are not “yet” successes). This, I suspect, is why CEDAC fears being misunderstood. Nevertheless, as Mosse (2006: 944) contends, social research must preserve its honour and its ideals for interpretation, and this includes differences of opinion. The researcher’s duty is to present his or her findings because, “the interests and rights of those studied should come first” (ASA, 1999). In this case, if farmer families stand to benefit from the exposure of certain information, and CEDAC might improve itself by internalising certain critiques (which are both big assumptions), then the interests of “those studied” have been served. In the end, representation might involve recasting ‘criticisms’ as ‘lessons to be learned’ or ‘suggestions for improved practices’. In order to be sure of my representation of CEDAC, I allowed the president to review my final drafts and offer comments. Although we differed in opinion on a few points, many others were reconcilable and, additionally, some errors were corrected. But it is not only my respect for CEDAC that drives me to represent their work constructively. As have already mentioned, CEDAC is embedded within the environmental movement and—which I support

⁴⁴ That, 13 August 2007, personal communication

ideologically. Constructive representation can allow the horizons of the movement for sustainable development to be pushed forward rather than held back.

Appendix 2

Rubrics and Factor Analysis Weights

Housing Material Valuation

Outer Wall, Inner Wall, and Roof

- Poor Quality: Bamboo, Thatch, None
 Medium Quality: Wood, Metal, Fibrous Cement
 High Quality: Concrete, Ceramic Tile

Flooring

- Poor Quality: Earth, Bamboo
 Medium Quality: Low-grade or used wood
 High Quality: High-grade wood, Cement

Wealth Index, factored weights

Component	Weight
livestock value	0.10765
livestock sales	0.07479
plough	0.09283
radio	0.02669
tv	0.05422
motorbike	0.09769
phone	0.02725
bicycle	0.01722
generator	0.01854
gas pump	0.07974
rice mill	0.01758
floor area per resident	0.05241
low quality floor	-0.14809
high quality floor	0.08893
low quality roof	-0.04481
high quality roof	0.09174
low quality outer wall	-0.11717
high quality outer wall	0.06205
low quality inner wall	-0.11907
high quality inner wall	0.06266
painted house	0.10948
battery	0.04656
toilet	0.02161
bucket well	0.00806
pumped well	0.01226
charcoal fuel	0.02484
buy wood	0.02158
wet rice field	0.04490
dry rice field	0.01433
orchard land	0.01161
garden land	0.02857
residential property	0.01158
pond area	0.01580

Cultivation Index, factored weights*

Component	Weight
age of seedling	-0.17812
stems per hill	-0.27214
depth (shallow)	0.05827
delay (days)	-0.11005
spacing (cm)	0.05916
field level (flat)	0.02737
water level (<5cm)	0.03883
line (straight rows)	0.09856
nursery (elevated)	0.03749
seedling selection	0.08504
weeding (frequency)	0.01493
fertilizer (bag/ha)	-0.03771
compost resources	0.03205
seed separation wind	0.05140
seed separation water	0.04661
seed separation salt	0.03746
pulling (gently)	0.18637
shaving (uncut stems)	0.13485

* Contents of parenthesis indicate value of 1 for dummy, unless otherwise noted

Appendix 3

Secondary Statistics Results

Correlation Coefficients

	wealth	avgyield	soiltype	literate	jobhigh	joblow	compost	resident	floorarea	SRI
wealth	1.0000									
avg. yield	0.1755	1.0000								
soil type	0.2352	-0.2930	1.0000							
literate	0.1939	-0.0825	0.1429	1.0000						
jobhigh	0.2337	-0.0094	0.1826	0.0833	1.0000					
joblow	-0.1183	0.0005	-0.1029	0.0126	0.1382	1.0000				
compost	0.2349	0.1427	-0.0770	-0.1448	0.1448	0.0746	1.0000			
residents	0.1467	-0.1539	0.1066	0.0781	0.2379	0.0824	0.0452	1.0000		
SRI	-0.0608	0.2428	-0.3635	-0.0934	-0.0934	-0.1038	0.2738	-0.0109	1.0000	

Paired t-test

H₀: mean(yieldnosri - yieldsri) = mean(diff) = 0

H_a: mean(diff) < 0
 t = -3.7951
 P < t = 0.0003

H_a: mean(diff) ≠ 0
 t = -3.7951
 P > |t| = 0.0006

H_a: mean(diff) > 0
 t = -3.7951
 P > t = 0.9997

Appendix 4

Occupations listed by salary classification

High	Medium	Low
Truck Driver	Carpenter	Student
Textile Production	Construction	Unemployed
Factory Worker	Alcohol Production	Ice Cream
Big Livestock	Teacher	Wise Man
Goldsmith	Palm Handicrafts	Vegetables
Blacksmith	Policeman	Orchard
Trader	Local Authority	Fish
	Musician	Handicap
	Palm Sugar	
	Rice Milling	
	Motorbike Mechanic	

Appendix 5

Interview List

This list includes anonymous and named interviewees. Named interviewees also appear in the bibliography.

Interview Type	Number of Interviews
Formal farmer family interviews	70
Chrei Tnot, Tramkok District	11
Tropang Kabas, Tramkok District	12
Tropang Ampil, Tramkok District	12
Hong Heng, Samraung District	11
Vaspors, Samraung District	12
Damnak Troyung, Samraung District	12
Open-ended interviews with farmers	19
Open-ended interviews with CEDAC staff	14
Open-ended interviews with academics, expatriate NGO staff, development agencies, etc.	9

Bibliography

- Adams, W. M. (1990) *Green Development: Environment and Sustainability in the Third World*. London: Routledge.
- Adams, W. M. (1995) 'Green Development Theory? Environmentalism and Sustainable Development' in J. Crush (Ed.), *Power of Development* (pp. 87-100). London: Routledge.
- Alrøe, H. F., & Kristensen, E. S. (2002) 'Towards a systematic research methodology in agriculture: Rethinking the role of values in science', *Agriculture and Human Values*, 19: 3-23.
- Altieri, M. (1987) *Agroecology: The Scientific Basis of Alternative Agriculture*. Boulder, CO: Westview Press.
- Altieri, M. A. (1995) *Agroecology: The Science of Sustainable Agriculture*. Boulder, CO: Westview Publications.
- ASA. (1999). The Ethical Guidelines for Good Research Practice. Retrieved 19/12/07, from <http://www.theasa.org/ethics/guidelines.htm>
- Aseniero, G. (1985) 'A Reflection on Developmentalism: From Development to Transformation' in *Development as Social Transformation* (pp. 48-85). Tokyo: United Nations University.
- Asia-Pacific Human Development Report. (2006). *Renewed Focus Needed on Agriculture as Asia-Pacific Turns to Imports*. Colombo: UNDP.
- Bakewell, O. (2007). Keeping Them in Their Place: the ambivalent relationship between development and migration in Africa. International Migration Institute.
- Bamberger, M. (2000) 'Opportunities and Challenges for Integrating Quantitative and Qualitative Research' in M. Bamberger (Ed.), *Integrating Quantitative and Qualitative Research in Development Projects*. Washington, D.C.: World Bank.
- Bao, V. (13 July). *Personal communication*. Angtasaom, Cambodia
- Bao, V. (2007). *CEDAC-Zone II*. Angtasaom, Cambodia: Centre d'Étude et de Développement Agricole Cambodgien.
- Batterbury, S. (2008). *Sustainable Livelihoods: still being sought, ten years on*. Paper presented at the Sustainable Livelihoods Framework: Ten Years of Researching the Poor.
- Bawden, R. J. (1991) 'Systems Thinking and Practice in Agriculture', *Journal of Dairy Science*, 74: 2362-2373.
- Bebbington, A. J. (1994) 'Composing rural livelihoods: from farming systems to food systems' in I. Scoones & J. Thompson (Eds.), *Beyond Farmer First* (pp. 88-93). London: Intermediate Technology Publications.
- Beynon, H. (1988) 'Regulating research: politics and decision making in industrial organisations' in A. Bryman (Ed.), *Doing Research in Organisations* (pp. 21-33). London: Routledge.
- Bot, A., & Benites, J. (2005). *The importance of soil organic matter*. Rome: UN Food and Agriculture Organization.
- Brosius, P. J., Lovelace, G. W., & Marten, G. G. (1986) 'Ethnoecology: An Approach to Understanding Traditional Agricultural Knowledge' in G. G. Marten (Ed.), *Traditional*

Agriculture in Southeast Asia: A Human Ecology Approach. Boulder, Colorado: Westview Press.

- Brot für die Welt, EED, Misereor, & Germanwatch. (2002). *Reflections on the needs to reform the EU Common Agricultural Policy in the light of developing countries demands toward agriculture in the WTO.* Presented at the For a Conversion of the Agricultural Protectionism, Germany.
- Byerlee, D., & Tripp, R. (1988) 'Strengthening linkages in agricultural research through farming systems perspective: The role of social scientists', *Experimental Agriculture*, 24: 137-151.
- Callon, M. (1980) 'Struggles and Negotiations to define what is the Problematic and what is not: the Sociology of Translation' in K. D. Knorr, R. Krohn & R. D. Whitley (Eds.), *The Social Process of Scientific Investigations: Sociology of the Sciences Yearbook* (Vol. 4, pp. 197-219). Boston: Reidel.
- Callon, M. (1986a) 'The Sociology of an Actor-Network: The Case of the Electric Vehicle' in M. Callon, J. Law & A. Rip (Eds.), *Mapping the Dynamics of Science and Technology* (pp. 19-34). London: Macmillan.
- Callon, M. (1986b) 'Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay' in J. Law (Ed.), *Power, Action and Belief: A New Sociology of Knowledge*. London: Routledge.
- Callon, M. (1991) 'Techno-economic Networks and Irreversibility' in J. Law (Ed.), *A Sociology of Monsters? Essays on Power, Technology and Domination (Sociological Review Monograph)* (Vol. 38, pp. 132-161). London: Routledge.
- Callon, M., & Latour, B. (1981) 'Unscrewing the Big Leviathans: How Do Actors Macrostructure Reality?' in K. D. Knorr & A. Cicourel (Eds.), *Advances in Social Theory and Methodology: Toward an Integration of Micro and Macro Sociologies* (pp. 277-303). London: Routledge.
- CEDAC. (2007a). *CEDAC's Contribution to Agriculture and Rural Development in Cambodia.* Phnom Penh: Centre d'Étude et de Développement Agricole Cambodgien.
- CEDAC. (2007b) 'CEDAC Ensures Integrity of Natural Agri-Products', *Natural Agri-Products Bulletin*, 1(1): 1-2.
- CEDAC. (2008). *CEDAC in Brief.* Phnom Penh, Cambodia: Centre d'Étude et de Développement Agricole Cambodgien.
- Chambers, R., & Conway, R. (1992). *Sustainable rural livelihoods: Practical concepts for the 21st century.* Brighton: IDS.
- Chambers, R., Pacey, A., & Thrupp, L. A. (Eds.). (1989) *Farmer First.* London: Intermediate Technology Publications.
- Chapman, M. (2001) 'Social Anthropology and Business Studies: Some Considerations of Method' in D. N. Gellner & E. Hirsch (Eds.), *Inside Organisations: Anthropologists at Work* (pp. 19-34). Oxford: Berg.
- Chong, D. P. L. (2003) 'UNTAC in Cambodia: A New Model for Humanitarian Aid in Failed States?' in J. Milliken (Ed.), *State Failure, Collapse & Reconstruction* (pp. 201-222). Oxford: Blackwell.
- Colletta, N. J., & Cullen, M. L. (2000). *Violent Conflict and the Transformation of Social Capital: Lessons from Cambodia, Rwanda, Guatemala, and Somalia.* Washington, D.C.: World Bank.

- Cornwall, A., Guijt, I., & Welbourn, A. (1994) 'Acknowledging process: methodological challenges for agricultural research and extension' in I. Scoones & J. Thompson (Eds.), *Beyond Farmer First* (pp. 98-117). London: Intermediate Technology Publications.
- Crewe, E., & Harrison, E. (1998) *Whose Development? An Ethnography of Aid*. London: Zed.
- D'Souza, G. E., & Gebremedhin, T. G. (1998) *Sustainability in Agricultural and Rural Development*. Aldershot, England: Ashgate.
- Dawe, D., & Doberman, A. (1998). Defining productivity and yield [Electronic Version]. *IRRI Discussion Papers* 33 from <http://www.irri.org/publications/discussion/discuss.asp?id=2>.
- Desai, B. (2006) 'Inside Out: Rationalizing Practices and Representations in Agricultural Development Projects' in D. Lewis & D. Mosse (Eds.), *Development Brokers and Translators: The Ethnography of Aid and Agencies* (pp. 173-193). Bloomfield, Connecticut: Kumarian Press.
- DfID. (2001). *Sustainable Livelihoods Guidance Sheets*. London: UK Department for International Development.
- DfID. (2007). *Moving Out of Poverty - Making Migration Work Better for Poor People*. London: UK Department for International Development.
- Dlamini, B. M. D., & Simelane, M. J. (1990) 'Quantitative and qualitative research: partners in rural development' in B. Hoeper (Ed.), *Quantitative versus Qualitative Approaches in Applied Empirical Research in Rural Development* (pp. 12-24). Bonn: Goetzy-Drucke.
- Dobermann, A. (2004) 'A critical assessment of the system of rice intensification (SRI)', *Agricultural Systems*, 79(3): 261-281.
- Ebihara, M. (1968). *Svay, a Khmer Village in Cambodia*. New York: Department of Anthropology, Columbia University.
- Elkington, J., & Lee, M. (2006, 14 February). Fatigue of Nations: What green looks like to the world's emerging economies. *Grist*, retrieved 20 December 2008, from, http://www.grist.org/biz/fd/2006/02/14/elkington_lee/.
- England, K. V. L. (1994) 'Getting Personal: Reflexivity, Positionality and Feminist Research', *Professional Geographer*, 46(1): 80-89.
- Escobar, A. (1995) *Encountering Development: The making and unmaking of the Third World*. Princeton, NJ: Princeton University Press.
- Fairbairn, D. K. (1995) 'Did the Green Revolution Concentrate Incomes? A Quantitative Study of Research Reports', *World Development*, 23(2): 265-279.
- Ferguson, J. (1985) 'The Bovine Mystique: Power, Property and Livestock in Rural Lesotho', *Man, New Series*, 20(4): 647-674.
- Fernandes, E., Pell, A., & Uphoff, N. (2002) 'Rethinking Agriculture for New Opportunities' in N. Uphoff (Ed.), *Agroecological Innovations: Increasing Food Production with Participatory Development* (pp. 21-39). London: Earthscan.
- Feuer, H. N. (2004). *Social Capital, Market Interaction, and Income-generation Capacity: An analysis of 2 villages in semi-rural Siem Reap Province, Cambodia*. Easton, Pennsylvania: Department of Economics & Business, Lafayette College.

- Francis, C., Lieblein, G., Gliessman, S., Breland, T. A., Creamer, N., Harwood, R., et al. (2003) 'Agroecology: The Ecology of Food Systems', *Journal of Sustainable Agriculture*, 22(3): 99-118.
- Freeman, A. M. I. (1998) 'The Ethical Basis of the Economic View of the Environment' in D. VanDeVeer & C. Pierce (Eds.), *The Environmental Ethics and Policy Book* (pp. 293-301). Belmont, CA: Wadsworth Publishing.
- Friberg, M., & Hettne, B. (1985) 'Greening of the World - Towards a Non-Deterministic Model of Global Processes' in *Development as Social Transformation* (pp. 204-270). Tokyo: United Nations University.
- Friddel, G. (2006) 'Fairtrade and the International Moral Economy: Within and Against the Market' in T. Shallcross & J. Robinson (Eds.), *Global Citizenship and Environmental Justice* (pp. 81-94). Amsterdam: Rodopi.
- Gellner, D. N., & Hirsch, E. (2001) 'Introduction' in D. N. Gellner & E. Hirsch (Eds.), *Inside Organizations: Anthropologists at Work*. Oxford: Berg.
- Gliessman, S. R. (1998) *Agroecology: Ecological Processes in Sustainable Agriculture*. London: CRC Press.
- Gliessman, S. R. (2006) *Agroecology: The Ecology of Sustainable Food Systems* (2 ed.). London: CRC Press.
- Haque, M. S. (1999) 'The Fate of Sustainable Development Under Neo-Liberal Regimes in Developing Countries', *International Political Science Review*, 20(2): 197-218.
- Haverkort, B., van der Kamp, J., & Waters-Bayer, A. (1991) *Joining farmers' experiments: Experiences in participatory technology development*. London: Intermediate Technology Publications.
- ITK Study Group (IDS Workshop). (1989) 'Farmers' knowledge, innovations, and relation to science' in R. Chambers, A. Pacey & L. A. Thrupp (Eds.), *Farmer First* (pp. 31-38). London: Intermediate Technology Publications.
- Jacobs, M. (1999) 'Sustainable Development as a Contested Concept' in A. Dobson (Ed.), *Fairness and Futurity: Essays on Environmental Sustainability and Social Justice* (pp. 21-45). Oxford: Oxford University Press.
- Judge, A. (1990) 'Through Metaphor to a Sustainable Ecology of Development Policies' in T. C. Trzyna & I. M. Gotelli (Eds.), *The Power of Convening: collaborative policy forums for sustainable development*. Sacramento, California: California Institute of Public Affairs. Retrieved 15 April 2008, from, <http://www.laetusinpraesens.org/docs/polforum.php>.
- Kaosa-ard, M. S., & Rerkasem, B. (2000) *The Growth and Sustainability of Agriculture in Asia*. Oxford: Oxford University Press.
- Kingdom of Cambodia. (2000). *National Report on the Implementation of the Convention to Combat Desertification*. Phnom Penh, Cambodia.
- Klages, K. H. W. (1928) 'Crop ecology and ecological crop geography in the agronomic curriculum', *Journal of the American Society of Agronomy*, 20: 336-353.
- Knorr-Cetina, K. (1981) 'The micro-sociological challenge of macro-sociology: towards a reconstruction of social theory and methodology' in K. D. Knorr & A. Cicourel (Eds.),

- Advances in social theory and methodology: toward an integration of micro- and macro-sociologies* (pp. 1-47). Boston: Routledge.
- Krishnamurthy, V. (1999). *The Impact of Armed Conflict on Social Capital: A Study of Two Villages in Cambodia*. Washington, D.C. and Phnom Penh: World Bank/Social Services of Cambodia.
- Latour, B. (1987) *Science in Action: How to Follow Scientists and Engineers Through Society*. Milton Keynes: Open University Press.
- Latour, B. (1988) *The Pasteurization of France*. Cambridge, Mass.: Harvard University Press.
- Latour, B. (1997, 2 May). On Actor Network Theory: A few clarifications. Retrieved 8 February 2008, from <http://www.nettime.org/Lists-Archives/nettime-l-9801/msg00019.html>
- Latour, B. (2004) *The Politics of Nature: How to Bring the Sciences into Democracy*. Cambridge, MA: Harvard University Press.
- Latour, B. (2005) *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Blackwell and the Sociological Review.
- Laulanié, H. d. (1993) 'Le système de riziculture intensive malgache', *Tropicultura*, 11: 110-114.
- Ledgerwood, J. (1998) 'Rural Development in Cambodia: The View from the Village' in F. Z. Brown & D. G. Timberman (Eds.), *Cambodia and the International Community: The Quest for Peace, Development, and Democracy*. New York: Asia Society.
- Leopold, A. (1981) 'The Land Ethic' in *A Sand County Almanac* (pp. 237-265). Oxford: Oxford University Press.
- Lewis, D., & Mosse, D. (2006) *Development Brokers and Translators: The Ethnography of Aid and Agencies*. Bloomfield, CT: Kumarian Press.
- Lewis, D. J. (1997) 'NGOs, Donors, and the State in Bangladesh', *Annals of the American Academy of Political Science*(554): 33-45.
- Lockwood, M. (1992) 'Facts or Fictions? Fieldwork relationships and the nature of data' in S. Devereux & J. Hoddinot (Eds.), *Fieldwork in Developing Countries*. Boulder, Colorado: Lynne Rienner.
- Long, N., & Villareal, M. (1994) 'The interweaving of knowledge and power in development interfaces' in I. Scoones & J. Thompson (Eds.), *Beyond Farmer First* (pp. 41-52). London: Intermediate Technology Publications.
- Maddocks, T. (1994). *Wet Season Rice Production Manual*. Phnom Penh: ADRA Cambodia.
- Markowitz, L. (2001) 'Finding the field: Notes on the ethnography of NGOs', *Human Organisation*, 60(1): 40-46.
- Marten, G. G. (Ed.). (1986) *Traditional Agriculture in Southeast Asia: A Human Ecology Perspective*. Boulder, Colorado: Westview Press.
- McDonald, A. J., Hobbs, P. R., & Riha, S. J. (2006) 'Does the system of rice intensification outperform conventional best management?: A synopsis of the empirical record', *Field Crops Research*, 96(1): 31-36.

- Meagher, K. (2008). *Making a Virtue of Calamity: Sustainable Livelihoods and Diversification in Nigerian Informal Enterprise*. Paper presented at the Sustainable Livelihoods Framework: Ten years of researching the poor.
- Meiksins Wood, E. (1997) 'Modernity, postmodernity, or capitalism?' *Review of International Political Economy*, 4(3): 539-560.
- Mishra, A., Whitten, M., Ketelaar, J. W., & Salokhe, V. M. (2006) 'The System of Rice Intensification (SRI): a challenge for science, and an opportunity for farmer empowerment towards sustainable agriculture', *International Journal of Agricultural Sustainability*, 4(3): 193-212.
- Moser, C. M., & Barrett, C. B. (2003) 'The disappointing adoption dynamics of a yield-increasing, low external-input technology: the case of SRI in Madagascar', *Agricultural Systems*, 76(3): 1085-1100.
- Mosse, D. (2001) 'Social Research in Rural Development Projects' in D. N. Gellner & E. Hirsch (Eds.), *Inside Organizations: Anthropologists at Work* (pp. 159-181). Oxford: Berg.
- Mosse, D. (2005) *Cultivating Development: an ethnography of aid policy and practice*. London: Pluto Press.
- Mosse, D. (2006) 'Anti-social anthropology? Objectivity, objection, and the ethnography of public policy and professional communities', *Journal of the Royal Anthropological Institute*, 12(4): 935-956.
- Mvena, Z. S. K., Lupanga, I. J., & Mlozi, M. R. S. (1990) 'Urban agriculture: the application and limitations of quantitative research techniques' in B. Hoeper (Ed.), *Qualitative versus Quantitative Approaches in Applied Empirical Research in Rural Development* (pp. 55-64). Bonn: Goetzy-Drucke.
- Nader, L. (1972) 'Up the anthropologist - perspectives gained from studying up' in D. Hymes (Ed.), *Reinventing Anthropology* (pp. 284-311). New York: Vintage Books.
- Nauta, W. (2006) 'Ethnographic Research in a Non-governmental Organisation: Revealing Strategic Translations through an Embedded Tale' in D. Lewis & D. Mosse (Eds.), *Development Brokers and Translators: The Ethnography of Aid and Agencies*. Bloomfield, CT: Kumarian Press.
- Ngasongwa, J. (1990) 'Qualitative approaches in applied empirical research in rural development: a case for support of data-economising methods' in B. Hoeper (Ed.), *Qualitative versus Quantitative Approaches in Applied Empirical Research in Rural Development* (pp. 25-36). Bonn: Goetzy-Drucke.
- Norman, D. W., & Collinson, M. (1986) 'Farming systems research in theory and practices' in J. Remenyi (Ed.), *Agricultural Systems Research for Developing Countries* (pp. 16-30). Canberra, Australia: ACIAR Proceedings No. 11.
- Oakley, A. (1990) 'Interviewing Women: A Contradiction in Terms' in H. Roberts (Ed.), *Doing Feminist Research* (pp. 30-59). London: Routledge.
- Or, T. (17 July 2007). *Personal communication*. Phnom Penh, Cambodia
- Ovesen, J., Trankell, I.-B., & Öjendal, J. (1996) 'When Every Household is an Island: Social Organization and Power Structures in Rural Cambodia', *Uppsala Research Reports in Cultural Anthropology*, 15.

- Pingali, P., Hossein, M., & Gerpacio, R. V. (1995) *Asian Rice Bowls: The Returning Crisis*. Wallingford, UK: CAB International and IRRI.
- Prak, C. (12 July). *Personal communication*. Tramkok district
- Pretty, J. N. (Ed.). (2005) *The Earthscan Reader in Sustainable Agriculture*. London: Earthscan.
- Prill-Brett, J. (1986) 'The Bontok: Traditional Wet-Rice and Swidden Cultivators of the Philippines' in G. G. Marten (Ed.), *Traditional Agriculture in Southeast Asia: A Human Ecology Perspective* (pp. 54-84). Boulder, Colorado: Westview Press.
- Rajpal, P. (2008). *The Adoption and Disadotion Behaviour of SRI Farmers in Cambodia*. Waltham, Massachusetts: Heller School for Social Policy and Management, Brandeis University.
- Richards, P. (1989) 'Agriculture as performance' in R. Chambers, A. Pacey & L. A. Thrupp (Eds.), *Farmer First* (pp. 39-43). London: Intermediate Technology Publications.
- Röling, N. G. (1994) 'Facilitating sustainable agriculture: turning policy models upside down' in I. Scoones & J. Thompson (Eds.), *Beyond Farmer First* (pp. 245-248). London: Intermediate Technology Publications.
- Root, M. (1993) *Philosophy of social science: the methods, ideals, and politics of social inquiry*. Oxford: Blackwell.
- Rose, G. (1997) 'Situation knowledges: positionality, reflexivities and other tactics', *Progress in Human Geography*, 21(3): 305-320.
- Rubin, H. J., & Rubin, I. S. (2005) *Qualitative Interviewing: The Art of Hearing Data*. London: Sage Publications.
- Sahn, D. E., & Stifel, D. (2003) 'Exploring Alternative Measures of Welfare in the Absence of Expenditure Data', *Review of Income and Wealth*, 49(4): 463-489.
- Satyanarayana, A., Thiagarajan, T. M., & Uphoff, N. (2007) 'Opportunities for water saving with higher yield from the system of rice intensification', *Irrigation Science*, 25: 99-115.
- Scoones, I. (1998). *Sustainable Rural Livelihoods: A Framework for Analysis*. Brighton: IDS.
- Scoones, I., & Thompson, J. (1994a) 'Introduction to Theoretical Reflections on Knowledge, Power and Practice' in I. Scoones & J. Thompson (Eds.), *Beyond Farmer First* (pp. 16-32). London: Intermediate Technology Publications.
- Scoones, I., & Thompson, J. (Eds.). (1994b) *Beyond Farmer First*. London: Intermediate Technology Publications.
- Scott, J. C. (1998) *Seeing Like a State*. New Haven, CT: Yale University Press.
- Sedara, K. (2001). *Reciprocity: Informal Patterns of Social Interactions in a Cambodian Village Near Angkor Park*. Dekalb, Illinois: Department of Anthropology, Northern Illinois University.
- Sen, S. (1999) 'Some Aspects of State-NGO relationships in India in the Post-Independence Era', *Development and Change*, 30(2): 327-355.
- Sheehy, J. E., Peng, S., Dobermann, A., Mitchell, P. L., Ferrer, A., Yang, J., et al. (2004) 'Fantastic yields in the system of rice intensification: fact or fallacy?' *Field Crops Research*, 88: 1-8.

- Sheehy, J. E., Sinclair, T. R., & Cassman, K. G. (2005) 'Curiosities, nonsense, non-science and SRI', *Field Crops Research*, 91(355-356).
- Shiva, V. (1997) *Biopiracy: The Plunder of Nature and Knowledge*. Cambridge, MA: South End Press.
- Shiva, V. (2000) *Stolen Harvest: The Hijacking of the Global Food Supply*. Cambridge, MA: South End Press.
- Shore, C. (2002) Introduction: Towards and Anthropology of Elites' in C. Shore & S. Nugent (Eds.), *Elite Cultures: Anthropological Perspectives* (pp. 1-21). London: Routledge.
- Shore, C., & Wright, S. (1997) 'Policy: A new field of Anthropology' in C. Shore & S. Wright (Eds.), *Anthropology of Policy: Critical Perspectives on Governance and Power* (pp. 3-39). London: Routledge.
- Singer, P. (1974) 'All Animals Are Equal', *Philosophical Exchange*, I: 103-116.
- Sras, P., & Chuong, S. (2007). *Comparison of the System of Rice Intensification with Conventional Practice in Dung Toung, Kampot Province*. Paper presented at the SRI Working Group.
- Stoop, W. A., Uphoff, N., & Kassam, A. (2002) 'A review of agricultural research issues raised by the system of rice intensification (SRI) from Madagascar: opportunities for improving farming systems for resource-poor farmers', *Agricultural Systems*, 71: 249-274.
- Suon, S. (25 September). *Personal communication*. Phnom Penh, Cambodia
- Suon, S. (2007a). *Impact of CEDAC Development Program on Small Famers' Livelihood*. Phnom Penh, Cambodia: Centre d'Étude et de Développement Agricole Cambodgien.
- Suon, S. (2007b). *Sustainable Rice-Based Livelihoods for Small Farmers in Takeo and Kampong Speu, Cambodia*. Phnom Penh, Cambodia: Centre d'Étude et de Développement Agricole Cambodgien.
- Surridge, C. (2004) 'Rice cultivation: Feast or famine?' *Nature*, 428: 360-361.
- SustainAbility. (2003). *The 21st Century NGO: In the Market for Change*. London, New York and Paris: SustainAbility, the UN Global Compact, United Nations Environment Programme.
- Temple, B., & Edwards, R. (2002) 'Interpreters/translators and cross-language research: Reflexivity and border crossings', *International Journal of Qualitative Methods*, 1(2): Article 1.
- That, S. (13 August). *Personal communication*. Phnom Penh
- Tiffen, M., & Bunch, R. (2002) 'Can a More Agroecological Agriculture Feed a Growing World Population' in N. Uphoff (Ed.), *Agroecological Innovations: Increasing Food Production with Participatory Development* (pp. 71-91). London: Earthscan.
- Uphoff, N. (1999) 'Agroecological implications of the System of Rice Intensification (SRI) in Madagascar', *Environment, Development and Sustainability*, 1(3-4): 297-313.
- Uphoff, N. (2002a) 'Introduction' in N. Uphoff (Ed.), *Agroecological Innovations: Increasing Food Production with Participatory Development* (pp. xv-xviii). London: Earthscan.
- Uphoff, N. (2002b) 'Opportunities for Raising Yields by Changing Management Practices: The System of Rice Intensification in Madagascar' in N. Uphoff (Ed.), *Agroecological*

- Innovations: Increasing Food Production with Participatory Development* (pp. 145-161). London: Earthscan.
- Uphoff, N. (2003) 'Higher Yields with Fewer External Inputs? The System of Rice Intensification and Potential Contributions to Agricultural Sustainability', *International Journal of Agricultural Sustainability*, 1(1): 38-50.
- Uphoff, N. (2005) 'The development of the System of Rice Intensification' in J. Gonsalves, T. Becker, A. Braun, D. Campilan, H. de Chavez, E. Fajber, M. Kapiriri, J. Rivaca-Caminade & R. Vernooy (Eds.), *Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook* (Vol. 3, pp. 119-125). Ottawa: International Potato Center-UPWARD and International Development Research Centre.
- Uphoff, N. (2006a). Comments on Data and Data Sources for Table 1 in McDonald et al. (2006). Cornell International Institute for Food, Agriculture, and Development.
- Uphoff, N. (2006b). Increasing Water Savings While Raising Yields with the System of Rice Intensification (SRI). Cornell International Institute for Food, Agriculture and Development.
- Uphoff, N. (2007, 17 July). *From discussion*. Presented at the SRI Working Group, Royal University of Agriculture, Phnom Penh.
- Uphoff, N. (Ed.). (2002c) *Agroecological Innovations: Increasing food production with participatory development*. London: Earthscan.
- Uphoff, N., & Sinclair, T. R. (2004) 'Grain of Truth: System of rice intensification responds to 21st century needs VS. Agronomic UFOs waste valuable scientific resources', *Rice Today, July-September*: 42-43.
- Uquillas, J. (1994) 'Institutional biases: who sets the research and extension agenda in Amazonia?' in I. Scoones & J. Thompson (Eds.), *Beyond Farmer First* (pp. 224-227). London: Intermediate Technology Publications.
- Vickery, M. (1992). *Cambodia's Economy: Where has it come from, where is it going?* Presented at the Indochina Economic Reconstruction and International Cooperation, Tokyo.
- Wedel, J. R. (2004) "Studying through' a globalizing world: building method through aidnographies' in J. Gould & H. S. Marcussen (Eds.), *Occasional Papers No. 24. Ethnographies of Aid: Exploring Development Texts and Encounters* (pp. 149-173). Roskilde: University of Roskilde.
- White, L. (1967) 'The Historical Roots of Our Ecological Crisis', *Science*, 155: 1203-1207.
- Wilson, E. O. (1996) 'Biophilia and the Environmental Ethic' in *In Search of Nature* (pp. 165-179). Washington, D.C.: Island Press.
- World Bank. (2008). *World Development Report 2008: Agriculture for Development*. Washington, D.C.: The World Bank.
- Wright, S. (1994) 'Introduction to Part III - Clients and Empowerment' in S. Wright (Ed.), *Anthropology of Organizations* (pp. 161-167). London: Routledge.
- Yang Saing, K. (1 August). *Personal communication*. Phnom Penh
- Yang Saing, K. (24 September). *Personal communication*.
- Yi, K. (21 September). *Personal communication*. Angtasaom, Cambodia

Yi, K. (17 March). *Personal communication*. Phnom Penh, Cambodia