CULTIVATING SUSTAINABLE LIVELIHOODS THROUGH EDUCATION & CAPACITY BUILDING: *MODELLING "EDUCATION FOR SUSTAINABLE DEVELOPMENT" TO ADVANCE COMMUNITIES OF PRACTICE*

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Introduction

This paper investigates how better linkages can be made between the two activities of Education for Sustainable Development (ESD) and community-based Capacity Development (CD). This paper provides an account of our preliminary attempts to establish a practical model of how education in general, and ESD specifically, can be coupled with efforts for local-level capacity development and community capacity building to increase ordinary people's incorporation of sustainable development and climate change mitigation into their daily lives. Case-studies from Thailand are presented to demonstrate areas of good practice in both bridging formal education with the local community and also providing non-formal education activities to increase the incorporation of principles of sustainability into individuals' daily lifestyles. Findings and suggestions are elaborated with the goal of applying a participatory—experiential education approach to the promotion of sustainable livelihoods, based on a communities of practice learning model.

Sustainable development is concerned with the holistic and systematic integration of development across the social, economic and environmental sectors. This ideal process creates a complex arena in which the activities of a single individual as he or she goes about his/her daily life are often unaccounted for. Furthermore, the achievement of sustainable development is effected by a plethora of diverse and coexisting factors, including: poverty, livelihood security, resource consumption, environmental degradation, climate change mitigation, and not least of all the need for further education regarding all of these issues. It must also be noted that these factors change across geographical, social and political contexts, thus making it impossible to prepare one comprehensive blueprint for sustainable development.

This limit of changing factors requires development solutions to be locally applicable and is highlighted in the proposed application of *Agenda 21* (UNCED) through the implementation of Local Agenda 21s.

> Because so many of the problems and solutions being addressed by Agenda 21 have their roots in local activities, the participation and cooperation of local authorities will be a determining factor in fulfilling its objectives... As the level of governance closest to the people, they play a vital role in educating, mobilising and responding to the public to promote sustainable development (UNCED, 1992: 28.1).

It is at the local-level where individuals can play an active role in development processes and where innovative solutions may be created to account for the unique contexts and factors of influence that effect the achievement of sustainable development. In order for ordinary citizens to participate in local efforts for sustainable development, they require knowledge and education for sustainable development with a specific focus on the areas where they can take direct action.

Capacity development is a concept that has evolved from the professional field of international development work and the beleaguered attempts to achieve poverty eradication. Development

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organisations such as the United Nations Development Programme are now arguing that, "capacity development is the engine of human development" (UNDP, 2009: 5). Furthermore, capacity development has received renewed attention as the main means for achieving the Millennium Development Goals (MDGs). Broadly, capacity development is considered the strengthening of capabilities to manage one's own development process, and this may aim at individuals, communities, organisations, institutions, or society. The general goals of education for sustainable development and capacity development are very closely linked, but because they have developed from separate disciplinary backgrounds there has been little effort to integrate the two concepts.

This research starts from the objective of integrating the activities of Education for Sustainable Development and community-based Capacity Development with the overall goal of strengthening the participation of ordinary people in sustainable development endeavours. However, as this research expanded, it was acknowledged that a more concrete and identifiable goal was needed to integrate the two main activities of ESD and CD. After preliminary research, it was decided that the goal of enhancing Sustainable Livelihoods provided the most coherent and viable target for implementing this process of integration. Sustainable Livelihood Approaches (SLA) are now applied by several leading development agencies, and in general they are framed around the concepts of capability, equity and sustainability (Chambers and Conway, 1992: 3).

The aim of this paper is to investigate the important interchange between Education for Sustainable Development (ESD) and initiatives to build communities of practice for securing Sustainable Livelihoods. The main question to be addressed in this paper is: "*How to advance the sustainable livelihood practices of individual people by engaging them in a process of experiential learning through promoting communities of practice for ESD*?"

Education, capacity development and livelihoods *for sustainability* – key theoretical concepts:

Education for Sustainable Development

Education for Sustainable Development is promoted as a process to engender a culture that is respectful to the core principles of sustainable development. ESD is advanced as an important social process as highlighted by the UN Decade of Education for Sustainable Development (2005-2014) (DESD) initiated with UNESCO as the lead organisation. UNESCO defines "education for sustainable development" in three parts:

- It means education that enables people to foresee, face up to and solve the problems that threaten life on our planet.
- It also means education that disseminates the values and principles that are the basis of sustainable development (intergenerational equity, gender parity, social tolerance, poverty reduction, environmental protection and restoration, natural resource conservation, and just and peaceful societies).
- Lastly, it means education that highlights the complexity and interdependence of three spheres, the environment, society – broadly defined to include culture – and the economy (UNESCO, 2005: 5).

The overarching goals of DESD are outlined by UNESCO as:

- Promote and improve the quality of education: The aim is to refocus lifelong education on the acquisition of knowledge, skills and values needed by citizens to improve their quality of life.
- Reorient the curricula: From pre-school to university, education must be rethought and reformed to be a vehicle of knowledge, thought patterns and values needed to build a sustainable world.
- Raise public awareness of the concept of sustainable development**:** This will make it possible to develop enlightened, active and responsible citizenship locally, nationally and internationally.

- Train the workforce: Continuing technical and vocational education of directors and workers, particularly those in trade and industry, will be enriched to enable them to adopt sustainable modes of production and consumption (UNESCO 2009: 7).

ESD proponents outline a reframed pedagogy of education as a process for engendering citizens with the ability to understand the relationships between themselves and the natural and social environments along with an ethic that supports betterment of society through sustainability. Education thus must not only be about information provision, but it requires the learning of advanced skills in systems thinking, critical analysis and participatory citizenship.

Another way of explaining the transformative process that many ESD proponents stress as inherent in the concept is through the division of 'first order', 'second order' and 'third order' learning (Sterling, 2002). First order learning is the functional and informative education, which is the primary activity of most formal learning institutions, that provides knowledge without any examination of the values and beliefs that predicate these understandings. Second order learning provides skills of critical reflection and engages the learner in direct examination of the predicating value-belief systems that shape knowledge frameworks. Third order learning takes this educational process further and promotes the creative exploration of different ways to structure our knowledge frameworks including the direct examination of prevailing worldviews with consideration of if this provides the most meaningful/functional understanding for dealing with the challenges society faces at present. Sterling explains, "[M]ost mainstream education *sustains unsustainability* – through uncritically reproducing norms, by fragmenting understanding, by sieving winners and losers, by recognizing only a narrow part of the spectrum of human ability and need, by an inability to explore alternatives, by rewarding dependency and conformity, and by serving the consumerist machine" (2002: 14-5).

Substantial attention has been paid to Education for Sustainable Development in the formal education sector during the first half of the UN Decade of Education for Sustainable Development both in policy and in practice. At the same time, much less research and investigation has addressed the cross-sector deployment of ESD within the area of community practice. The importance of the non-formal and informal sectors of ESD is clearly stated in international policy. However, the application of ESD as an informal component of building communities of practice is rarely undertaken and is overlooked in the majority of research concerning ESD. In order for ESD to encourage behavioural change across large swaths of the global population in the immediate to near future, it is necessary that ESD impacts upon more than just those numbers currently within formal education.

Community-based Capacity Development

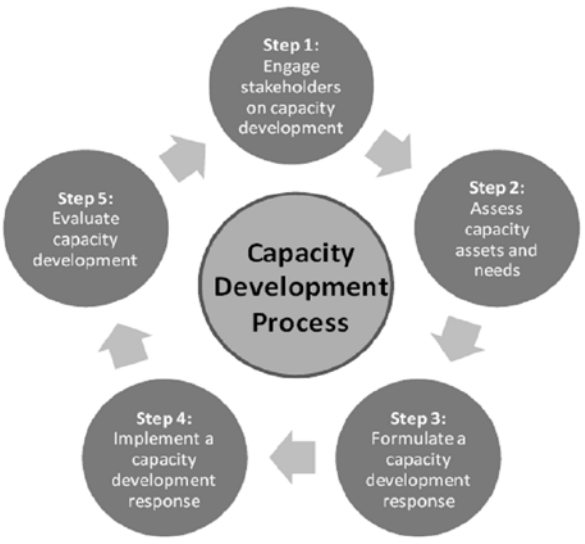
Capacity development began in development discourses and international aid programmes in the mid-20th Century. The concept has gone through many manifestations and has faced periods of endorsement and condemnation. Capacity development received renewed importance in the 21st Century including its promotion as a primary tool for achieving the Millennium Development Goals. The basic definition of capacity development is a process of securing and enhancing the capabilities to achieve development objectives and socio-economic goals through self-determination. The Organisation for Economic Co-Operation and Development (OECD) divides the pursuit of capacity development across three analytical levels: 1) individual, 2) organisational, and 3) the enabling environment (or the societal level).

> Capacity development involves much more than enhancing the knowledge and skills of individuals. It depends crucially on the quality of the *organisations* in which they work. In turn, the operations of particular organisations are influenced by the *enabling environment* – the structures of power and influence and the

institutions – in which they are embedded. Capacity is not only about skills and procedures; it is also about incentives and governance (OECD, 2006: 7).

In a report by the Asian Development Bank (ADB), it was concluded that the majority of the countries in the Asia-Pacific region suffer from low-levels of capacity, and even in countries that have received substantial ODA funding there had often been little improvement in capacity development. "Constrained capacity clearly remains one of the major obstacles to sustainable development in the Asia and Pacific region, hampering service delivery to the poor, as well as impacting negatively on the investment climate and on the effectiveness of development lending" (ADB, 2007: 1). The past poor performance of capacity development is a result of its limited early conception as a process of increasing financial capital and technical know-how through the application of one-size-fits-all solutions. In contrast, a new approach evolving over the last decade aims at enhancing local capabilities to pursue sustainable development, as is highlighted in the UNDP approach: "Capacity development starts from the principle that people are best empowered to realise their full potential when the means of development are sustainable – home-grown, long-term, and generated and managed collectively by those who stand to benefit" (UNDP, 2009: 5).

Figure 1: The UNDP Capacity Development Process



Source: Capacity Development Group – UNDP, 2009: i

While most international development agencies do acknowledge the role of community in capacity development, the community-level is usually not their primary target. At the level of community practice, the concepts of community capacity-building (CCB) and comprehensive community initiatives (CCIs) are often discussed in parallel with capacity development. Chaskin (2001) suggests four factors as the shared components across definitions of community capacity: "1) the existence of resources (ranging from the skills of individuals to the strength of organisations to access to financial capital), 2) networks of relationships (sometimes stressed in affective, sometimes in instrumental terms), 3) leadership (often only vaguely defined), and 4) support for some kind of mechanisms for or processes of participation by community members in collective action and problem solving" (ibid., 292-3).

Community is a contested concept in academic literature, and though it is used in practice with less reservation it is still difficult in practice to contextualize. In this work, community-based capacity development is used for the fact that community does bring with it a significant, though difficult to define, aspect to capacity. The idea of community includes a sense of locality and a sentiment towards meaningful relationships. Delanty (2003) provides a postmodern analysis of community that identifies its 'communicative potential' as a powerful defining aspect. It is in community that people engage in discourse and create – recreate understandings of the world around them. "The power of community consists in the emergence of definitions, principles and cognitive models for imagining the world" (2003: 157). This understanding of community, one which is defined not by the boundaries of a community but rather by the significant learning processes that it engenders, allows for valuable connection with the ideal desire for transformation change contained in the concept of capacity development.

Sustainable Livelihoods

Sustainable Livelihood Approaches (SLA) is one of several concepts created for better assessment of local contexts in development work for poverty eradication. The idea of sustainable livelihoods was originally presented in *Our Common Future* (1987), however the first definitive working paper on SLAs is considered Chambers and Conway's paper "Sustainable Rural Livelihoods" (1992). SLAs now provide both a way to assess local contexts and a theoretical framework for planning development processes. Adapting the definition put forward by Chambers and Conway, the Department for International Development (DFID) defines sustainable livelihoods as:

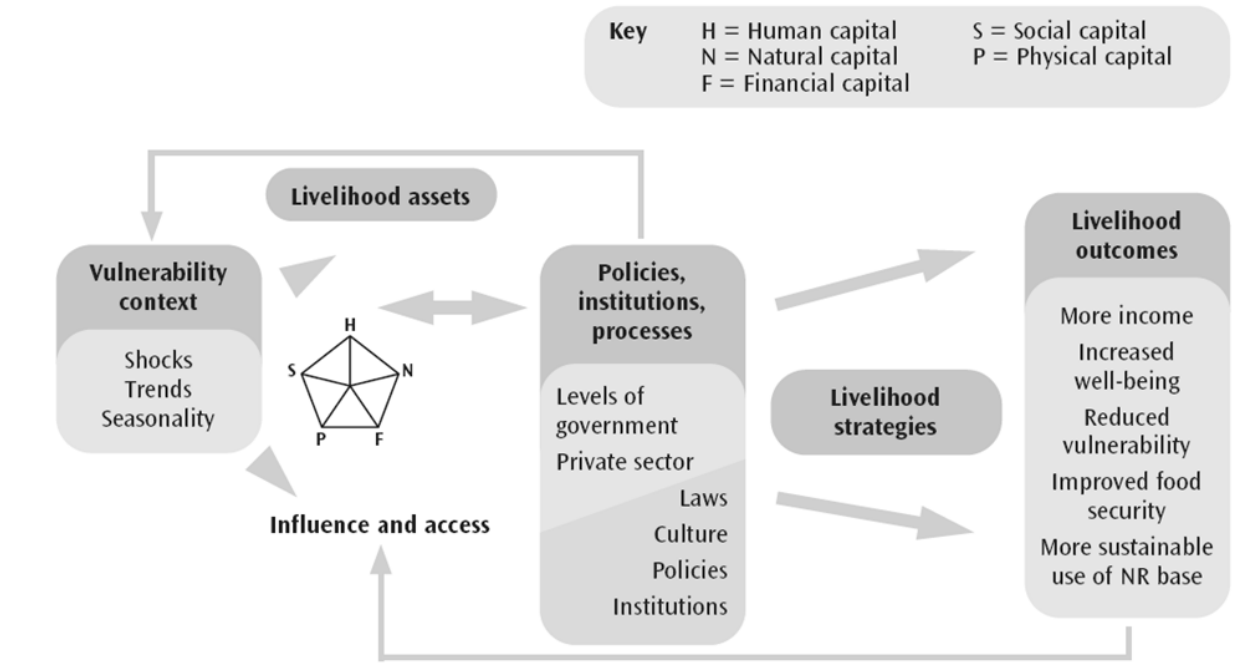
> A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (DFID, 1999a: 1).

DFID, as a main proponent of SLAs, has developed a working framework to better identify and account for the main factors that affect people's livelihoods in the planning of development activities (see Figure 2 for this framework, and see DFID 1999b for elaboration on this framework).

The Sustainable Livelihoods framework developed by DFID was originally intended to aid their work on poverty eradication, however its benefit has proved applicable across a much wider spectrum for understanding how people's individual livelihoods and day-to-day living impact on the general achievement of sustainable development and finds especially valuable application in natural resource management projects. In assessing the current situation, the framework considers three main factors: vulnerability context, livelihood assets, and transforming structures and processes (DFID, 1999a: 1). The vulnerability context addresses those factors of the external environment – considering potential shocks, predictable social trends, and seasonal changes – that can have a significant impact of people's livelihoods. The vulnerability context highlights the types of factors and stresses that the livelihoods of poor people are especially fragile to (DFID, 1999b: 2.2). The asset pentagon is used to represent the status of livelihood assets, and it is comprised of five types of capital: human, social, natural, physical, and financial. This is a visual tool in which, "The shape of the pentagon can be used to show schematically the variation in people's access to assets" (DFID, 1999b: 2.3). Transforming Structures and Processes (referred to in Figure 2 as policies, institutions, processes) considers the influence of institutions, organisations, policies and legislation on livelihoods. They can be assessed based on their given impact on access to capital, terms of exchange between different types of capital, and the returns they provide to support livelihoods (DFID, 1999b: 2.4).

Once the first three assessment steps of the sustainable livelihood framework have been completed, the next step is to develop livelihood strategies to work towards achieving the desired livelihood outcomes. The basic purpose of this strategy is to adequately manage the use of the previously identified assets in order to gain a good quality of life without jeopardising the future stock of these assets or consuming them faster than their regenerative capacities. The development of a livelihood strategy is guided by a series of SLA principles: 1) people-centred, 2) holistic, 3) dynamic, 4) building on strengths, 5) macro-micro links, and 6) sustainability (DFID, 1999a: 1.3). Livelihood strategies can also be noted for working to improve the quantity and quality of choices available to people, strengthening the security of existing assets, and increasing the overall resilience of the livelihood system (especially to the impact of temporary shocks and stresses).

Figure 2: DFID's Sustainable Livelihoods Framework



Source: Twigg, 2007: 2

Considering the educational value of community - appropriate analytical frameworks

Communities of Practice

The social learning theory "Communities of Practice" (developed by Lave and Wenger 1991, Wenger 1998) provides a valuable concept for understanding the important learning opportunities that exist at a community-level. The concept of communities of practice is postulated on three common aspects: *mutual engagement*, *joint enterprise*, and *shared repertoire.* The concept starts with the idea that people group together to complete activities, and in doing so they must negotiate the meanings of the actions they engage in with one another. "Membership in a community of practice is therefore a matter of mutual engagement. That is what defines the community" (Wenger, 1998: 73). The second aspect, joint enterprise, accounts for the fact that this type of mutual engagement must be a negotiated experience in which both purpose and relationships of accountability are developed. This leads to the community establishing its own unique form of practice. The mutual engagement and joint enterprise of a community of practice leads to the development of the third aspect – a shared repertoire. Through a history of negotiation and practice, a common set of resources are established that allow the members of the group to interact without having to constantly re-examine shared understandings.

The concept of communities of practice has gained support as a valid approach to *situated learning.* "The overall apparatus of situated learning is a significant rethink of learning theory of value to anyone wanting to take learning beyond the individual… Part of its appeal is that a seemingly natural formation which enhances learning can be consciously developed, which is important for those implementing change" (Barton and Tusting, 2005: 3). The learning process in communities of practice is dynamic in that renegotiation and change are a continuous part of such practice. *Reification* and *participation* are key aspects to this learning process as the two main ways in which participants can influence the process of practice. In the process of community practice, *reification* is the act of bringing concrete meaning to

abstract concepts through their regular application and codification. *Participation*, on the other hand, is the process through which diverse ideas and concepts can be deliberated over to reach common understanding to structure practice on (Wenger, 1998: 88-93).

The purpose of presenting the *Communities of Practice* concept in this work is to introduce this as a valuable conceptual framework for understanding social learning theory. The key point that will be further explored is the basic architecture of how the *Communities of Practice* concept is funtionalised. Communities of practice are especially valuable because they allow for both the acquisition of existing knowledge and the creation of new knowledge through the dynamic process of mutual engagement in a shared practice. In designing a learning architecture for communities of practice, Wegner introduces three modes of belonging as central pillars of this design: *engagement*, *imagination*, and *alignment*. Each pillar consists of a further three identified facilities:

Engagement
- Mutuality;
- Competence;
- Continuity.

Imagination
- Orientation;
- Reflection;
- Exploration.

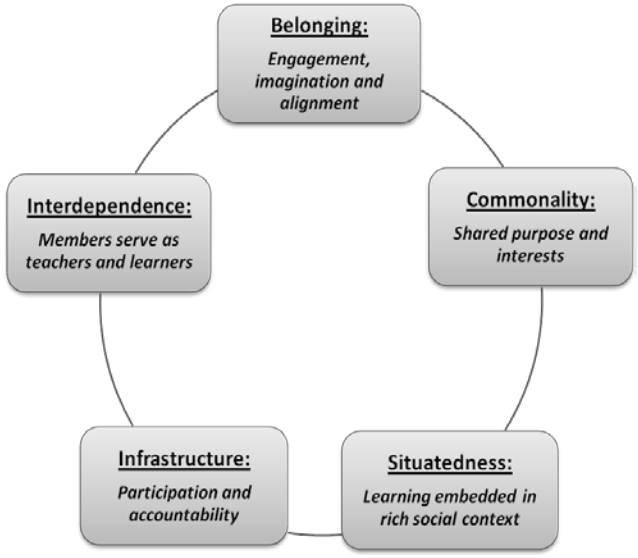
Alignment
- Convergence;
- Coordination;
- Jurisdiction

(Wegner, 1998: 237-9).

Hung and Chen (2001) identify four dimensions of an effective learning community (though their research is on web-based communities, the four dimensions have wider applicability). First, *situatedness* – from the concept of situated cognition – puts forth that learners obtain both implicit and explicit knowledge when learning is embedded in rich social contexts. Second, *commonality* expresses the importance of a shared sense of purpose and common interests among a group of participants to engage in reflective practice. Third, *interdependency* is established when the various members of a group of learners bring to the group both unique skills and expertise and differing demands on the group. Fourth, an *infrastructure* that promotes and facilitates participation and ensures accountability is important for the long-term continuation of communities of practice (Hung and Chen, 2001: 7). By adding *belonging*, as elaborated by Wegner and explained above, as a fifth dimension of an effective learning community we further strengthen the understanding of its basic architecture (see Figure 3).

A further aspect of communities of practice that must be considered is the individuals that make up the learning group. Handley et al. (2006) explain that identity-construction and formation of self is a critical process for the individual members of a community of practice (644-5). In order for communities of practice to be dynamic, individuals must be empowered to explore and express their own identities. If members only "participate" in ways that they see as complying with and mimicking the other members of the group, then there is little possibility for transformative social learning.

Figure 3: Five Dimensions of an Effective Learning Community

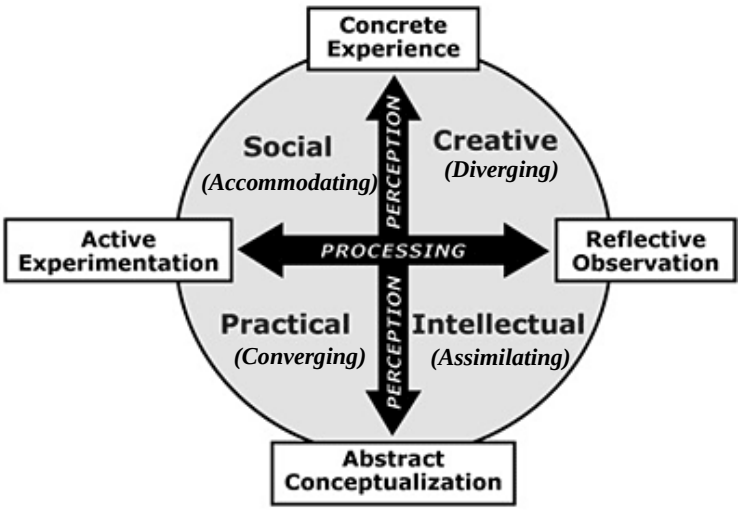


Experiential Learning

Experiential learning theory (ELT) provides a conceptual model of a "complete" learning cycle that incorporates all preferred learning styles. ELT was originally formulated by Kolb and Fry (1975) and Kolb (1984) and influenced by the works of John Dewey, Jean Piaget and Kurt Lewin. Experiential learning theory defines learning as, "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (Kolb 1984: 41). Kolb identifies four continuous stages that create the experiential learning cycle: concrete experience, reflective observation, abstract conceptualisation, and active experimentation.

Kolb further presents two primary dimensions of learning: 1) *perception* – the way in which information is grasped from experience, ranging from concrete experience to abstract conceptualisation; and, 2) *processing* – the way in which the information is processed, ranging from active experimentation to reflective observation. These two intersecting axes create four quadrants from which four learning styles are identified (see Figure 4). In this learning cycle, value is placed both on concrete/real-world experiences and abstract thinking/reflection as important processes through which we gain knowledge. Breathnach suggests that the reflexivity embodied in the learning cycle is essential for encouraging responsive and proactive development rather than reactive change (2006: 13).

Figure 4: Kolb's Experiential Learning Theory



Source: Schaller, et al. (2007)

Kolb also identifies four learning styles from this theory: diverging, assimilating, converging, and accommodating. A *diverger* learns through experience and reflection, usually has a strong imagination and is good at seeing multiple perspectives. An *assimilator* prefers to reflect and conceptualise often using inductive reasoning and is good at creating theoretical models. A *converger* learns through conceptualising and then experimenting, and is strong at practical application of concepts and hypo-deductive reasoning. An *accommodator* prefers experimentation and action, solves problems intuitively and is able to create practical solutions (Tennant cited by Smith, 2010).

Full and rich learning experiences will provide opportunities to participate in all four learning activities and accommodate each of these learning styles. When ELT is integrated with a communities of practice approach, the holism of this cycle is of significant experience as it provides a strategic process for engendering the collective creation of knowledge through the three aspects of belonging: engagement, imagination and alignment. Furthermore, the deliberation that occurs in communities of practice to form shared understandings is facilitated by this process of planning, experimenting, experiencing and reflecting.

The ELT provides a unique model for considering the approach of development work, especially those efforts aimed at sustainable development and community-based capacity development. Bell and Morse (2003, 2005) in their work on measuring the progress of sustainable development and establishing

indicators for monitoring and evaluation also point to Kolb's learning cycle as a way to ensure systemic learning for sustainability. The performance of many sustainable development projects are assessed using linear and logical frameworks that Bell and Morse suggest often lead to unrealistic assumptions regarding project achievements, dependency on 'blue-print' models, and a disruption of participation. However, they also suggest that experiential learning as a goal of project performance can aid in alleviating the narrowing views and, "is perfectly consistent with the notion of a project acting as a spark to providing a more enduring achievement" (Bell and Morse, 2005: 40-1).

The concept of experiential learning is regularly applied in two contrasting approaches. First, in the field of formal education, ELT is used to strengthen discussions about teaching/learning techniques and often leads to a mandate for institutions to provide more holistic and diversified educational experiences especially those that provide for more direct participation. Second, as a model of informal education, ELT is used to explain how people learn from daily life experiences (Smith, 2010). In the approach presented in this chapter to integrate the theories of communities of practice and experiential learning, ELT is being applied corresponding with the informal education approach. Thus, the learning cycle's main benefit is to demonstrate how valuable experiential learning can occur through community practice.

Participatory Action Research and the Participatory Approach to Development

There are several related concepts of reflective problem solving that provide valuable tools for enhancing the learning opportunities present in communities of practice. The most encompassing of these concepts is Participatory Action Research (PAR) which is primarily understood as a methodological approach to experimental research in the social sciences, however because of the PAR process of the researcher directly participating in community practice and investigating practical means for improving performance quality it has also been widely discussed by development practitioners. PAR evolved from the works of several academics and development practitioners from the 1970s forward. The development of PAR was strongly influenced by Paulo Friere's work in the 1960-70s on critical pedagogy and democratic education. Though PAR is considered a concept that many people contributed to, one of the defining moments in its evolution is the 1977 conference in Cartagena, Colombia on 'action research' organised by Orlando Fals Barda during which his ideas on action research were mated with Budd Hall's ideas on participatory research resulting in the eventual conglomeration of PAR.

The initial conceptualisation of Participatory Action Research drew heavily on concepts of alternative development as a way to formulate transformative change. PAR has more recently been promoted as an approach to obtain better understanding of the challenges of sustainable development (Allen, 2001 and Ballard et. al., 2003). PAR is based on, 'act[ing] in intelligent and informed ways in a socially constructed world' (Reason and Bradbury, 2003). Rather than a positivist approach that requires a hypothesis driven model of objective research, transformational action research suggests direct engagement and reflexive inquiry in the areas and with the communities one is researching (Foote Whyte, 1991: 7).

The basis for PAR is to create a new methodology that dramatically shifts the role of the researcher towards one that actively and positively supports the community in which one is working. Three broad strategies for research/practice are identified. First person action research is concerned with the researcher and his or her ability to act through inquiry basing choices on awareness and best practice and to assess the effects of these actions in real world experience. Second person action research involves face-to-face relationship and how the researcher can foster the growth of mutual care/concern. Third person research aims at creating communities of inquiry that can extend beyond the confines of face-to-face relationships (Reason,

2001). A full PAR approach incorporates all three strategies, and an iterative cycle of action and reflection is also applied which aids the development of adaptive knowledge capacities. The basic steps of the action-reflection cycle create a continuous learning process and are described as: plan → act → observe → reflect.

The main objectives of PAR are to develop practical knowledge that benefits people in their day-to-day living, to contribute to the well-being of communities, and to empower the development of communities of inquiry (Reason, 2001). However, this can create difficulty in assessing the success of practices and procedures used during research. Action research may find validation from pragmatic and/or consensus validation. Pragmatic validation is directly linked to finding a balance between action and reflection. It also encourages a spiral design that continually acknowledges the casual relationships on which measures are based, thus each analysis and measure is likely to lead to a new requirement for research and action. Consensus validation involves the evaluations, interpretations and knowledge generated by the participants of the cooperative inquiry group and the larger community (Irgens Karlsen, 1991: 154-5). It is the generative capacity of new and innovative knowledge that is applicable at a community-level that is regarded as the real strength of PAR (Gaventa and Cornwall, 2001: 75).

Participatory approaches to development work are recognised as a separate and distinct methodology, albeit highly interrelated with the academic concepts of PAR. Participatory Rural Appraisal (PRA), later Participatory Rapid Appraisal, is the most common participatory approach employed by development practitioners. Robert Chambers is recognised as one of the leading proponents of participatory approaches in development work, especially as a tool for empowering local people and promoting community ownership over the development process. Development practitioners started experimenting with local participation in their work in the 1970's, and in the 1980's a growing shared experience began to emerge including Chambers' important publication *Rural Development: Putting the last first* (1983). However, it was not until the 1990's that PRA became mainstreamed by several international development agencies, and by the following decade a range of criticisms were arising regarding the co-optation of participation rhetoric and its subsequent limitations (see Cooke and Kothari, 2001).

These critiques include concerns about the extent to which participation occurs, the tokenism of participation when it does occur, the appropriation of the idea of participation by top-down development agencies, the unchallenged championing of participation, and the control of participatory methods by elite groups. The mainstay of these criticisms focus not on the participatory methods themselves, but rather they are concerned with the overall approach to which PRA is applied – especially by some international agencies as a form of knowledge extraction to inform projects that remain strictly controlled by the outside, expert agencies. Addressing these critiques, Hickey and Mohan suggest, "The question for participatory interventions becomes how they can enhance the 'competency' of participants to project their agency beyond specific interventions into broader arenas, thereby progressively altering the 'immanent' processes of inclusion and exclusion" (2004: 66).

The methods of PRA provide tools for development planning that can be applied in a community or village setting to identify local, indigenous context. PRA methods are used to explore spatial patterns/local environment, time/temporal dimensions, and relationships between different factors. The overall approach aims to be flexible with no specific blueprint, instead striving for an adaptive learning process that builds step-by-step on the knowledge being generated. PRA applies triangulation to cover the same sets of information from multiple directions to ensure the validity of findings.

Case Selection Criteria

Early on in the research process, it was recognised that there are very few existing projects officially linking ESD and Sustainable Livelihoods, but it was also recognised that there are several projects carrying out this type of activity without using these specific terminologies. Thus, a case selection criteria was established from the identification of the core goal set shared between four key concepts: ESD, Sustainable Livelihoods, Capacity Development and/or Sufficiency Economy. The resulting criteria are:

- Sustainable Development focus
- People-Centred
- Holistic, Dynamic Balance
- Livelihood Security
- Integrate for Inter-dependence
- Promotes Behavioural Change
- Care for: People, Society, and Culture
- Care for: Environment and Nature
- Participation and Engaged Citizenship
- Use Knowledge Wisely: Values and Integrity
- New Learning Methodologies: pedagogical change
- Whole-Systems Thinking
- Supported by Outside Key Actor

The selection criteria were established to consider the nature and approach of the visible goals, achievements and outcomes of each project. During the first round of the research process a total of forty-two potential cases were identified and reviewed. These cases were assessed based primarily on content analysis of printed materials. From the assessment, the number of potential cases was reduced to twenty-two. The final reduction of field visits to sixteen cases was based on the logistics of scheduling and travel.

Description of Cases

The sixteen cases selected for further investigation can be divided into two equal categories. Eight cases focus on formal education and integrating ESD or community participation into the school curriculum. The other eight cases focus on non-formal education and community-based initiatives. Cases were categorised based on their primary focus, though some cases do include aspects of both formal and non-formal education.

ESD in formal education – schools creating experiential learning opportunities

The eight cases categorised as "ESD in formal education" can be further subdivided as four cases that are specific individual schools, and four educational programs that work with multiple schools (see Appendix A for the main features). The four schools are extremely diverse in nature. Klongpittayalongkorn School is a public school run by the Bangkok Municipal Administration that lies on the far outskirts of the urban area and very close to the Bay of Bangkok. Summa Sikkha School is part of the intentional Santi Asoke Buddhist community in Bangkok and provides education to the 60+ children growing up in this community. Roong A-Roon School of Dawn is a private school in Bangkok that was set up by several Thai educators to provide an education based on Buddhist principles to Thai children. The Prem Tinsulanonda Center is an international, boarding school based in the countryside 25 kilometres outside of the city of Chiang Mai.

The four education programs that work across multiple schools are also diverse in nature, however two of the cases are closely related. The Magic Eyes Barge Program is a unique outdoor experiential education program that provides classroom and accommodation for students on a converted rice barge that travels

on the Chao Phraya river. The Thai Eco-School Project is an initiative of the Ministry of Natural Resource and Environment (MNRE) and is managed through the Department of Environmental Quality Promotion (DEQP) to facilitate schools to integrate ESD across the learning environment as a core curriculum theme through the application of a whole-school approach that incorporates campus/resource management as part of the teaching process. The Mahingsa Youth Leadership Project supports the formation of local youth environmental investigation teams to promote conservation activities in their schools and communities. The Eco-School Coaching Team provides training for school administrators and teachers to facilitate their efforts to become an eco-school. The training model applies a whole school approach based on a four part framework: 1) Environmental policy and administrative management structure, 2) Environmental education development process, 3) Resource management, and 4) Community participation and networking.

ESD in non-formal education – connecting to practical, community living

The eight cases of "ESD in non-formal education" have many different characteristics (see Appendix B for the main features). Two projects are non-profits that provide unique educational programmes. The Thai Education Foundation (TEF) provides experiential educational opportunities to study local ecology known as REAL (Rural Ecology and Agricultural Livelihoods) education model that incorporates aspects of community development and sustainable livelihoods, and it draws heavily on the traditions of Integrated Pest Management (IPM) and the Farmer Field School approach. The International Sustainable Development Studies Institute (ISDSI) runs semester-long experiential education courses focussing on sustainable development for American university students opting to study abroad. ISDSI works with several communities to develop courses taught by village members on their local environment, livelihood activities and culture.

Two cases provide learning centres to support capacity development for sustainable livelihoods. The Bhumirak Dhamachart Center established a practical learning model based on sufficiency economy theory expounded by King Bhumibol Adulyadej of Thailand to provide farmers with skills and knowledge to farm in an environmentally friendly manner and to secure a self-sufficient livelihood. The Forest Agriculture Center "for Life and Society" provides a practical learning model focussing on how to secure a living through forest management and conservation. The center teaches a self-reliance philosophy based on three principles: 1) how to get food and medicine from the forest, 2) how to get wood for fuel and for building from the forest, and 3) how to guarantee a comfortable living during old age. Another project, the Community Based Tourism Institute (CBT-I) helps to facilitate local communities in their efforts to establish community-based tourism initiatives by providing capacity building for community members to conduct participatory appraisals, asset assessments, community planning workshops, and training for villagers to manage the tourism aspects.

Two cases are projects established as part of community-led activities. Pun Pun Sustainable Living and Learning Center is a land project established as home to a small community of people and as a learning model for sustainable/ecological living. The community specialises in earthen building and seed saving. Wongsanit Ashram is an intentional Buddhist community that promotes an alternative lifestyle grounded in principles of dharma, cultural diversity and environmental sustainability. The community provides training programs on grassroots leadership, social activism, empowerment of marginalised communities, ecological living, non-violence and engaged spiritualism. The final project, Bangkok Sea Conservation Network is a group of six villages working together for the conservation of the surrounding coastal environment. This case provides a model of grassroots community organising to bring together people from across a region to combat a common problem and to establish a collective voice that can have meaningful political influence.

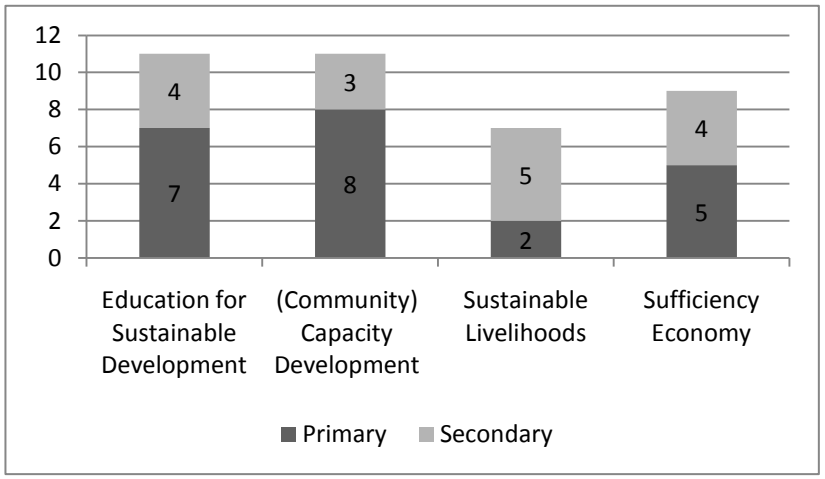
Analysis of Cases

Identified Core Concepts

The interviewees were asked to identify the core concepts that are part of the working objectives of their project or initiative. The interviewees identified both those concepts that had primary and secondary significance in line with four main categories: ESD; community capacity development; sustainable livelihoods; and sufficiency economy (see Figure 5 for responses). Community Capacity Development and ESD received the highest rankings with capacity development receiving one more ranking as a primary factor. Capacity Development was regularly the core objective of the non-formal education cases, and ESD was regularly the core objective of the formal education cases. Sustainable Livelihoods was not a topic that was regularly a primary objective of the cases investigated, however it did receive the highest number of responses as a secondary factor.

Figure 5 – Identified Core Concept of Project

(note: some cases identified more than one primary or secondary factor)



Those interviewees that highlighted ESD, especially for formal education cases, as a core concept also explained the importance of utilising ESD as a tool to reform the overall educational process and pedagogy. It was explained that ESD provides a stimulus for integrating learning concepts across traditional disciplinary boundaries and also to provide teaching models based on practical, real world problem solving to engender skills of critical analysis and reflection. Another aspect of this teaching model as applied in the practical learning stations at Klongpittayalongkorn School, Roong A-Roon School, and the Magic Eyes Barge Program is using common/simple daily activities to explain complex concepts, such as using a compost system to explain the science behind healthy soil ecology.

Success Factors

The interviewees were also asked to discuss the important success factors for their respective cases (see Table 1 for full responses). There were two factors that have high commonality across the cases. First, the application of an innovative teaching/learning model and methods were highlighted as a key success factor in 75% of the cases. Second, the provision of a high-quality learning environment was reported to be a main factor of success in 63% of the cases. In regards to the teaching/learning models, more cases in formal education identified this as a key success factor than did the non-formal education cases. This may be a result of the fact that the cases in formal education place a higher priority on utilising the new learning methodologies elaborated as part of ESD and also in general spend more time developing their teaching/learning methodologies as professional educators. The ranking of the learning environment as a key success factor was evenly divided between the formal and non-formal cases.

Table 1 – Success Factors of Cases, as identified by interviewees

Klongpittayalongkorn School	• Provision of strong learning environment where students can engage in experiential education. • Integration of "Sufficiency Economy" across curriculum. • Learning stations are based on local and indigenous knowledge to demonstrate how sustainable livelihoods can be obtained from the local environment.
Summa Sikkha School	• Education based on practical learning and self-practice of the 5 principles of Buddhism. • Cooperation and support for each other. The community functions as a large family. • Faith in the community's leader/founder: Phra Bodhirak
Roong A-Roon School of Dawn	• Students are encouraged to consider their own dreams and goals and then to set up their own learning targets. • The education process breaks away from traditional, passive learning models. And, it involves students in active learning through participation in activities that are relevant to their daily lives. • The practical learning stations provide unique and valuable educational opportunities.
Prem Tinsulanonda Center	• Provision of top-quality education and excellent facilities. • Ensuring professional quality of teachers. • Integration of ESD throughout the curriculum.
The Magic Eyes Barge Program	• Maintaining a strong focus on education while providing fun and exciting new experiences for the students. • Strong relationship with the local communities the students visit.
Thai Eco-School Project	• The extensive review process prior to implementing pilot schools provided a strong foundation. • The use of several coaching teams in different regions across the country is very important to the successful implementation of the eco-schools. • The decentralization of education budget by the Ministry of Education has provided more freedom for schools to undertake innovative projects. • The popularization of "Sufficiency Economy" has created attention for projects like the eco-school initiative.
Mahingsa Youth Leadership Project	• Provision of an effective training workshop for the project facilitators. • Knowledge and good practice sharing from one project to the next. • Supporting activities through the provision of printed materials and by creating partnerships.
Eco-School Coaching Team	• Providing knowledge and capacity building in clear framework. Utilizing four main objectives: environmental policy and management structure, environmental education development process, integrated resource management, and participation and environmental education network. • Focusing the education process on student and community participation. Are students happy and enjoying learning?
Thai Education Foundation	• The learning process is key success factor. It is based on experiential and action learning, and it helps to advance analytical skills. • It empowers both students and the wider community, and thus it strengthens community pride/spirit. • It supports/appreciates indigenous and local knowledge.
Community Based Tourism Institute	• Empowering communities to take pride in their way of life and to recognize the riches they do have, i.e. cultural and environmental wealth. • Building capacity for the communities to cooperate with government officials, NGOs, and tourists. • Facilitating self-organizing and participatory appraisal/planning by communities.
International Sustainable Development Studies Institute	• Work only with communities that are excited to be involved. • Facilitation of teaching skills for community members to becomes the main educators. • For students, providing diverse experiential learning opportunities based on a rigorous curriculum. • Thorough preparation and risk management.
Bhumirak Dhamachart Center	• Changing the paradigm of farmers' thinking. • Providing a working model where farmers can experience the benefits of these practices.

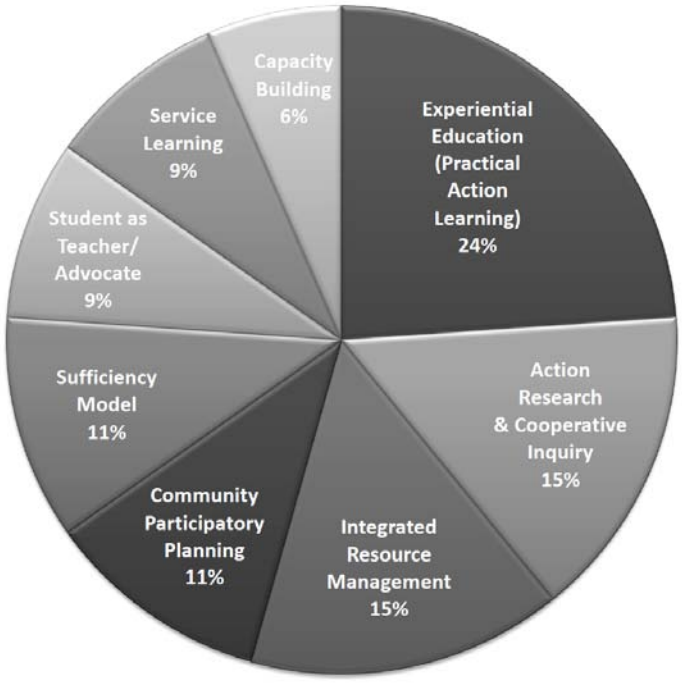
	• Promote the self-esteem of the farmer and help them understand how they can survive self-sufficiently (not dependent). • Teach them how to improve the soil without chemical (high-cost) inputs.
Forest Agriculture Center	• Teaches practices that are relevant to daily life. • Facilitating the community to build their own plan through critical discussion. • Having a clear concept they are teaching and providing a good learning environment. • Having a strong learning model and many applications/opportunities to apply new knowledge/thinking to.
Pun Pun Sustainable Living & Learning Center	• Simplified way of life. • Education is based on practice, and principles applied in practice are simple because they are based on nature. • Having a working model that can inspire people. The project was started on the poorest quality, barren land to demonstrate that even this land could be developed and made fruitful.
Wongsanit Ashram community	• For Community: communication, open heart, good leadership, and spiritual way. • For Courses: Utilizing a strong learning process based on the "Spirit in Education Movement" and providing a unique learning environment.
Bangkok Sea Conservation Network	• Building strong relationships and strengthening the desire to work together as an extended community. • Continuity of efforts so that there are regular, visible improvements.

Learning Models and Methods

Twelve out of the sixteen cases identified the learning and teaching models/methods they used as the primary success factor of their projects. Experiential Education was the most common learning model used, applied in eleven of the sixteen cases. Action Research (and Cooperative Inquiry) and Integrated Resource Management tie as the second most regularly used learning model, applied in seven cases each. Together these three learning models constitute more than half of the learning models identified across the cases (see Figure 6 for all applied learning methods).

Applied in conjunction experiential education and action research can provide a highly influential learning model for understanding and developing strategies for sustainable development. However, it is necessary to clearly distinguish between the two learning models because they are sometimes confused. Experiential education provides learning experiences based on practical examples and attempts to engage the learner in direct action and focused reflection. Action research is a learning methodology that applies self-directed investigation and inquiry which leads the students through a process of progressive problem solving. Both models are linked with deeper theories of learning and demonstrate valuable approaches. There is one significant distinguishing feature between the two models that must be noted – the expected learning outcomes attached to each approach. Experiential learning often is used in parallel to more traditional classroom and book learning, furthermore the topics of study are usually pre-established and there is a general expectation for the transfer of a specific knowledge set depending on the lesson. With action research, the teacher may set a general area of investigation, but the process of establishing the areas to investigate are usually identified by the students and the solutions that the students develop can be unique and innovative. Thus, the expected learning outcome of action research is less concerned with specific knowledge transfer and more so with strengthening the skills of critical analysis and reflection.

Figure 6 – Diversity of Applied Learning/Teaching Methods across cases



Critical analysis skills are regularly recognised as an important objective of ESD, nonetheless it remains unaddressed in many ESD curriculums. This in general highlights the division between the learning of knowledge and the learning of skills (especially skills for life-long learning). In general, experiential education supports the learning of preset knowledge. It does also strengthen learning skills such as observation and reflection, however ironically as it is applied in many schools it does not always engage the full cycle of Kolb's experience learning theory (as explained in chapter two). Action research as a process aims to create a full learning cycle that directly engages the students in defining their own learning process and establishing original understandings of the issues they investigate. It is interesting to also note that three of the four cases that applied the student as teacher/advocate model also had the students undertake action research. The process of action research allowed the students to not only investigate a given subject but also to formulate their own opinions, suggestion and justifications, thus the students had a strong foundation to then play the role of advocate.

Integrated resource management (IRM) is a process that can be applied across a diverse range of contexts to achieve multiple objectives: as an educational tool, as a practical tool for environmental management, and as a means to establish a learning environment. IRM provides a tool for the coordinated planning of resource use in consideration of environmental, social and economic needs and constraints in order to optimize the sustainable benefits over the long term. As an educational tool, IRM requires direct investigation of the inter-linkages between complex systems and diverse sectors which provides both valuable knowledge and skills for sustainable development. The strategic planning activities involved in IRM help individuals to reflect upon the impacts of certain types of action and to clearly identify the objectives they want to pursue into the foreseeable future.

Learning Environments

The provision of a high-quality learning environment provides a substantial foundation for successful experiential learning programs. However, just among the ten cases that identified this as an important success factor, the design and specifics of their learning environments vary considerably. The most significant difference between cases is the division between single school experiential learning campuses and independent learning centres that attract outside visitors and provide short courses. Both approaches prove effective, and to properly assess which approach is better for a given situation requires an analysis of several other contextual factors. For example, the individual school projects do require a significant initial investment and access to extra land near the school. For a local or regional government that strongly wants to extend experiential ESD opportunities, there may be resource constraints that make the approach of establishing this type of learning campus at every school impossible. When this is the case, focussing

resources on the development of one (or a small number of) very high quality experiential learning campus that students throughout a region can travel to may prove an overall more effective use of limited resources.

The Eco-School Project is promoting a model though that utilises environmental resource management and energy efficiency as both a way to develop experiential learning opportunities and also to reduce a school's operational cost. The initial implementation of this project does require a small set-up cost and training/capacity-building for school administrators and teachers, and DEQP provided grants to pilot eco-schools (each around $1,000 USD). A similar project, the Green School Programme, was launched in China in 2003, and a survey of the existing Green Schools in 2006 found that the campus environmental management practices had resulted in an average savings of approximately $2,300 USD with more than half of the savings being realised from water saving, electricity saving and reduction of paper consumption (Ke, 2009: 107-8). The whole school approach and the efficient management of the campus/resources applied in the Eco-School project is an innovative way to establish schools that offer opportunities for integrated and multi-disciplinary learning and several practical experiences for experiential learning on sustainable lifestyles. While the examples of the mangrove project at Klongpittayalongkorn School and the multiple activity centres at Roong A-Roon School provide even more substantial opportunities for both experiential learning and also action research. These models are very unique and provide an exceptional learning environment for the schools' students, though they do not aim at creating the same type of financial savings.

Independent learning centres for ESD and EE can be highly effective, especially when there is a desire to extend the education opportunities beyond school-age children and to engage with the wider community, such as local farmers. The development of these independent learning centres can provide hubs of excellence for ESD and can in most cases cover a wider variety of subjects or learning activities than the individual school projects can. While the school-based projects usually provide learning activities that are relevant only to the local ecology, independent learning centres have more opportunities to model multiple types of solutions that are relevant to different respective ecology types. For example, the Bhumirak Dhamachart Center models solutions from multiple regions in Thailand, provides examples of management for three different forest types, and provide focus areas on improving soil ecology, fresh water management and flood control, wastewater treatment, food production, and house construction.

A few of the cases also present a third model in which the projects utilise the natural, local environment as a field laboratory for investigation and action research. This model is a standard and well-developed approach to environmental education, and it also proves an effective approach to student-as-advocate (or as-teacher) educational models and for addressing local, anthropogenic environmental problems that are often controversial subjects. The REAL environmental education project managed by the Thai Education Foundation is strong example of this model in which teachers receive training in many schools to implement this field-based environmental investigation. Many NGOs use this approach to develop an environmental education project and implement it in individual schools. This has specific benefits in countries where no resources are allocated for EE activities, but this approach has not been as successful for promoting ESD due in part to the limited scope and lack of opportunities for multidisciplinary integration in this approach.

Conclusions and Recommendations

The discussion of analytical frameworks provides a review of three social learning theories: communities of practice, experiential learning and participatory action research. One possibility for integrating these three theories is to view the development of *communities of practice for ESD* as the target to set in motion the long-term learning for sustainable livelihoods, and the application of *participatory—experiential education* may be viewed as the tool for reaching this objective. We can postulate that the desired achievement for a community of practice for ESD should be the negotiation of shared understandings of sustainable development and livelihoods.

Effective communities of practice are organised around three main principles: *engagement*, *imagination*, and *alignment*, though the five dimensions of an effective learning community may also be considered: *situatedness, commonality, interdependence, infrastructure (for participation),* and *belonging.* In order to simplify the discussion regarding participatory—experiential education, the plan → act → observe → reflect cycle of PAR may be considered as parallel to the ELT cycle of concrete experience, reflective observation, abstract conceptualisation, and active experimentation. It is important though to keep in mind the four learning styles and their relation to the PAR cycle: diverger, assimilator, converger, and accommodator. What must be considered now is how best to initiate effective communities of practice and to stimulate their learning processes on sustainable development through a participatory—experiential education model.

Three main steps can be formulated for engaging communities of practice for ESD, however these steps are complex and will each require the achievement of multiple factors (see Figure 7 below). The first step is referred to as *engagement in a situated community*, and this requires that the infrastructure for participation in community planning for sustainable development is set in place and that the community has access to the vehicles of change. The second step is referred to as *exploration of innovative interdependence*, and this uses action research to implement observation, assessment and reflection regarding the community's given capacity and livelihood assets. This step will engage community members as both teachers and learners regarding their relationship to local assets and capital. The third step is referred to as *aligning common understandings and coordination for sustainable development*, and this aims for community-based strategies and planning for sustainable development and livelihoods. The practical action that follows from this step allows the individuals of a given community of practice to move from abstract conceptualisation to concrete experience and thus stimulates a process of reification. Together these three actions should achieve a sense of belonging in an ESD community of practice and a sense of responsibility towards the transition to sustainable livelihoods and development patterns.

Figure 7: Steps to Initialising an ESD Community of Practice

Applying this new analytical approach to the analysed results of the case studies, several valuable findings may be highlighted. In regards to the first step of *engagement in a situated community*, we see that the learning methodologies can be applied to draw out a culturally grounded approach that is rooted in the local contexts of the community and environment. Furthermore, it is the participatory engagement in the anticipated process of improving and developing the capacity of the community that serves as a trigger for continued local engagement. Integrated Resource Management provides a specific educational model that must address the needs of the community and also the existing natural assets with the overall objective of improving the ecosystem capacity through good management and thus also strengthening the security of local livelihoods. For this first step, it is the situational context contained in IRM models that is the driving force by increasing recognition of the relationship between local livelihoods (quality-of-life is also relevant here) and the health of the local environment.

This primary step is also important for securing an infrastructure that facilitates participation, cooperation and local jurisdiction over assets/capital and to also consider the (knowledge) capacities required among communities to complete the full process highlighted in Figure 7. The Community-Based Tourism Institute is one case that strongly deals with this first step by working with communities to develop clear goals and objectives for their cooperation on establishing community-based tourism through providing capacity building for community members to conduct research/assessment of capacity, assets, and opportunities; to prepare integrative plans and strategies for development activities; and to manage all of this through a process of participatory decision making. The model of support by CBT-I to establish a strong infrastructure to facilitate communities of practice for developing community-based tourism options utilises all of the project's identified success factors. This includes the promotion of pride in local ways of life, indigenous knowledge and the recognition of the richness of their traditional culture.

The second step of *exploration of innovative interdependence* is the stage where strong investigative learning and action research should be implemented to encourage participatory—experiential education on sustainable development and livelihoods. From the case studies, we learn how action research engages the students in defining their own learning process and establishing original understandings of the issues they investigate, which in regards to communities of practice for ESD is a significant opportunity to apply the full ELT/PAR learning cycles. The case with the strongest application of action research is the Thai Education Foundation's REAL education programme which also uses the student-as-advocate model. The REAL education programme is flexible enough to be applied across numerous schools and local contexts, but it is also designed in a way that allows students to directly investigate unique aspects of their local environments and identify innovative solutions to tackle current problems facing those environments. The basic process in the REAL programme is similar to what is aimed at in this step: the participants identify the areas of focus they believe are significant; they research the context and assess current practices; challenges and obstacles are identified; innovative solutions are conceptualised; and the participants then explain to others the lessons learned and advocate these new solutions to the wider community.

The importance of creating effective learning environments must also be considered in correspondence with this second step. However, in regards to creating communities of practice outside of formal education institutions, there needs to be some adaptation to the approaches towards learning environments from the cases. Since the goal of initiating communities of practice is to achieve practical transitions towards sustainable livelihoods, the desired learning environment should be the real world. The school based learning environments demonstrate the value of using everyday activities as opportunities for investigating

our relationships to the local environment, and this could be applied to an investigation of livelihood practices and their connection to natural assets. From the independent learning centres model, an important lesson is the need for examples of expertise to learn from. In sustainable development, it is not usually a suggestion to focus only on one action or topic, but in regards to demonstrating innovative solutions it is important to have at least one or two really well developed areas to exemplify the types of achievements being worked for across all sectors even if most areas are still under construction. Applied to a communities of practice approach, this could be accomplished by the members selecting a few areas where they are most familiar and confident and then putting a significant amount of their efforts to developing these areas at a much more rapid rate than most areas. Thus establishing valuable examples to both learn from and be inspired by.

The third step of *aligning common understandings and coordination for sustainable development* is the stage of planning and action, which is an important process in the learning cycle as it reifies the knowledge gained throughout the early stages by the transition from conceptualisation to experience. Planning is not a strong part of the formal education cases, but several non-formal cases do incorporate planning frameworks as part of their teaching curriculum. The Forest Agriculture Center provides a strong example of effective planning and action. Though the learning centre teaches many practical skills through experiential education, it also frames all of its learning structure around the establishment of three levels of planning which teaches individuals to develop plans for: 1) oneself and family (household level plan), 2) community plan, and 3) resource management plan. Starting at the household level and considering the ability to meet basic needs, it is easier for individuals to come to terms with the process of sustainable development planning and from this point extend their focus to the wider community and environment.

In consideration of the transition from abstract conceptualisation to concrete experience, unfortunately there are no direct approaches that apply from the case evidence. Nonetheless, one example where we see this movement is as part of both the Eco-School and REAL education models where students develop innovative solutions for projects that end up implemented in the community. Not only does the realisation of their imagined solution create a sense of pride for the students, but the opportunity to reflect on the actual impact is an important stage in the learning cycle as a means to initiate its continuation through another phase. An important part of this process is to ensure that reflection follows action and inputs into future planning phases.

Outside actors engaged in supporting local-level transitions to sustainable development and sustainable livelihoods can utilise this model of initialising ESD communities of practice to strengthen their overall contribution. Programmes for development assistance may be strategically prepared to engage each of these three steps to ensure the formation of a community of practice that engages in a meaningful learning cycle based on the PAR and ELT frameworks. At each step of the proposed process in Figure 7, there is a need for tools and approaches to facilitate the achievement of each learning goal. This work will often take the form of capacity building and human resource development so that the members of the communities of practice have ownership over the knowledge and assets that are needed to successfully manage this process, and thus it is important that this support aims at establishing the appropriate organisation, strategy and capacity for the long-term management of the initiative to be maintained fully from within the local-community. As seen from the case evidence, outside actors can also provide valuable support in the form of financial assistance, networking between communities, good practice sharing, and aiding access to market opportunities.

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Appendix A – Formal Education Cases: Description of Main Features

Case Title:	Klongpittayalongkorn School, Khwang Thakham Khet Bang Khun Thian, Bangkok Municipal Administration School	Summa Sikkha School, Santi Asoke Buddhist Community school, Bangkok	Roong A-Roon School of Dawn, *(Private School)* Bangkhutien, Bangkok	Prem Tinsulanonda Center for International Education, Chiang Mai	The Magic Eyes Barge Program, Bangkok	Thai Eco-School Project, Department of Environmental Quality Promotion, Ministry of Natural Resources and Environment	Mahingsa Youth Leadership Project, Department of Environmental Quality Promotion, Ministry of Natural Resources and Environment	Professor Prasarn Tangsikabuth, Chiang Mai University *(leader of Eco-School Coaching Team for Northern Thailand)*
contact-	Kirtphon Klinhom, Headmaster	Khun KoKo	Ajeen Apidoon	Dr. David Baird, President Ms. Lynda Rolph, Head of Programs (Visiting Schools and Barge)	Lynda Rolph	Khun Nantawan Lourith, Prof. Prasarn is head of Northern Thailand coaching team	DEQP	Team Leader for Coaching Team on Eco-Schools in Northern Thailand
initiation year-	The mangrove project was started in 2005	Community was started 32 years ago; and the school was founded in 1994	1997	2000	Started in 1994 as independent project. In 2005, joined Prem Center.	2007 initiated pilot schools, 41 pilot schools with 2 years to prepare and implement	2003 launched as pilot titled "Youth Environmental Award Program"	2007 initiated pilot schools, 9 schools in 5 provinces in the north of Thailand.
innovation-	Established mangrove project on school land to create learning model for self-reliance. Work to integrate concept of sufficiency economy into lesson plan.	Utilise working stations in community so students can participate in practical action. Students only study in classroom for 2 hours a day. Teaching motto is: 40% for good morals, 35% for being able to work, and 25% for academic.	Holistic education to connect learning to daily life. This aims to create consciousness, morality, and wisdom. Action learning is coupled with in class learning, thus breaking away from passive education.	As a center of excellence providing a range of institutions and programs, the Prem Center is committed to education for global responsibility and the betterment of humanity. Committed to operating in a sustainable and socially responsible way.	Providing high quality outdoor experiential education for Thai and international schools in Thailand, and schools throughout the southeast Asia region and around the world.	Key points are resource management, participation and networking with community, and teaching. This project uses a whole-school approach that incorporate campus and resource management as part of teaching process.	Environmental investigation and conservation project. Youth team with facilitator build project to: 1) Discover, 2) Explore, 3) Conserve, and 4) Share.	The whole school approach is applied in a 4 part framework: 1) Environmental policy and administrative management structure, 2) Environmental education development process, 3) Resource management, and 4) Community participation and networking.
main goal/ objective-	In addition to the 8 National Standard subjects, a "local curriculum" subject is added to the regular teaching. The focus is on integrating across disciplines and demonstrating interrelationships.	The main purpose is to develop people with good hearts. Provides a supportive living and working community based in the 5 practices of Buddhism.	Classroom learning is directly linked to activity centers including: recycling, rice growing, food preparation, health, wood working, pottery, charcoal, biodiesel, medicinal herbs, textiles, and weaving.	International Baccalaureate Program (IBP) standards. Utilises the AtKisson Compass of Sustainability. Self-exploration is limited to extra-curricular.	Facilitate lifelong learning using interdisciplinary, interactive, and cooperative approaches, emphasising the interconnections between physical, cultural, social, and historical aspects of the environment.	This project was inspired by the Green School Project in China, led by the Chinese Ministry of Environmental Protection. The goal is to integrate ESD across the learning environment as a core theme of the curriculum.	To stimulate the youths to develop scientific, social, and problem-solving skills. To gain a respect for the value of natural resources. To take part in development of their community . To feel responsible for conservation activities.	The role of the coaching team is to provide capacity building for school administration and teachers in the implementation of the eco-school project.
staff/ students-	24 teachers, 12 staff ~500 students	62 students, 300 members of community	100 teachers 80 support staff 1,000 students K-12 2 teachers per class, and additional specialty teachers for specific subjects	28 teaching staff 475 students	18 total: captain and 3 crewman; accountant; secretary; 4 Thai teaching staff; 3 international teachers; 3 interns; cleaner; and program head	At DEQP, 10 staff contribute to this project. Each region has coaching team to help schools make transition.	At DEQP, 6 or 7 staff contribute to this project.	1 team leader and 2 associates in Coaching Team
campus-	16 Rai (~2.56 Hectares) is additional to main school campus and is set up with mangrove plantation and several learning stations for practice of local knowledge.	Specific teaching area is small, but the school is closely interlinked with wider community. Students work in 15 different stations as part of their education. For the first year of secondary school, they attend an agriculture school in a partner Santi Asoke community.	50 Rai (~8 Hectares); The school is situated around a small lake with several outdoor learning centres, rice patty, and out-buildings for crafts and music. The main classroom buildings each contain 3 classes of students and operate as a "family unit".	225 Rai (~36 Hectares) contain a large school, boarding houses, gymnasium and farm. The school's facilities are all very high quality and the students are well catered for. Adjacent to the campus is the related housing/ neighborhood development.	The main campus is a converted rice barge taking students on learning trips on the Chao Phraya river and visiting several villages along the way. Teaching occurs both on boat and on land. The boat also has cooking, cleaning and sleeping facilities.	Project run by DEQP, with funding from Provincial Environmental Education Centres (PEEC). Prior to developing the project, the ways in which EE and ESD are taught were investigated across 11,000 schools. Pilot schools receive a grant of 30,000 THB for the first year of implementation.	Most projects involve exploring and researching local environment.	Besides a focus on environmental-friendly management of school campus and resources, the eco-school model also takes a strong interest in students actively participating in the local community and learning from local context and issues.

Appendix B – Non-Formal Education Cases: Description of Main Features

Case Title:	Thai Education Foundation, Bangkok	Community Based Tourism Institute (CBT-I), Chiang Mai	International Sustainable Development Studies Institute (ISDSI), Chiang Mai	Bhumirak Dhamachart Center *(The King's Sufficiency Economy and Farming Capacity learning center)*, Nakor Nayok	Forest Agriculture Center "for Life and Society" & Eastern Forest Conservation Network, Chachoengsao	Pun Pun Sustainable Living & Learning Center and Seed Bank, Chiang Mai	Wongsanit Ashram community, Nakor Nayok	Bangkok Sea Conservation Network, Khwang Thakham Khet Bang Khun Thian, Bangkok
initiation year-	TEF was formed in 1996 (work had begun in 1995). Originally founded in partnership with World Education Foundation	CBT-I was formed in 2006 with support from the Thailand Research Fund. Formed by partnership of 2 previous organisations: REST started in 1994 and the TRF CBT Team started in 2001	Founded in 1999 under a different name in collaboration with Kalamazoo College in the United States.	In 1989, the land was purchased by the King. In 2002, the Center was started. All planting of trees began in 2005.	Wiboon Kemchalerm worked the land on his own for many years. He opened the project to the public in 1983. In 1996, work began on creating a larger forest conservation network.	The land was purchased in 2003. Khun Jo had been running trainings on earthen building throughout Thailand for two years prior.	The community was founded in 1985 by Sulak Sivaraksa and a group of supporters.	The network was launched in 2007. Khun Krudhon had started conservation & networking efforts three years prior. In 2006, they gained the support of the Thai Community Foundation.
contact-	Khun Marut Jatiket	Khun Potjana (Noi) Suansri, Kanaruj Mingmethaporn and Peter Richards	Dr. Mark Ritchie	Ajeen Panya Puliwekin	Khun Chai; founder Wiboon Kemchalerm	Jon Jandai (Jo)	Khun Mol; Mr. Pracha Hutanuwatra and Mr. Somboon Jungprempree	Khun Kruhdhon, community advocate for Klongpittayalongkorn School
general focus-	Promoting sustainable farming and "Integrated Pest Management" in schools for students to become the leaders of change in the environmental practices of rural communities.	Facilitate communities to research and develop community based tourism to strengthen local communities and to support natural resource management. Provide community-based tourism training. Act as an info centre for community based tourism in Thailand. Facilitate cooperation among stakeholders to support CBT.	Provide learning opportunities for American university students to study sustainable development in the context of local/indigenous cultures in Thailand. Provides opportunities to study political, cultural and eco-anthropological aspects of sustainable development.	Demonstration model for sufficiency economy theory. The reason given for the establishment of this center is "to create a learning society for self-reliance in stages, so that people can have practical experience in adopting this philosophy to their lives."	Focusing on securing livelihood from forest: -How to get food (and medicine). -How to get wood. -How to guarantee good living in old age. Since 1996, working to develop a conservation network with villages throughout the region and strengthen community livelihoods from forest protection.	To provide a practical model of seed saving, earthen building, and self-sufficient living. The center also runs courses and internships in seed saving and earthen building.	Buddhist community devoted to developing and promoting an alternative lifestyle that is grounded in dharma, cultural diversity & environmental sustainability. It is home to a number of educators and social activists who lead programmes in grassroots leadership, natural building, and empowering marginalised communities.	Conservation of coastal environment.
target audience-	School students, Farmers, and rural communities. Specifically working to "reduce pesticide usage".	Local/Indigenous communities, Tourism Industry, and Government. As of 2009, CBT-I has worked with over 50 communities throughout Thailand.	American college students ISDSI works with indigenous communities to establish practical learning opportunities, but they purposely work with communities who already have a decent level of self-organising.	Farmers	Youth and Students, Local communities and villagers, and some governors.	Provide a teaching and learning centre for farmers, urban middle class who want to make change, and Westerners.	Many workshops are held at the Ashram including courses related to green politics, social justice, non-violence, and engaged spirituality. These workshops provide a holistic education for students, monks, nuns, and grassroots community leaders.	The local communities and villages with the goal of working together to protect their greater environment. They also target the government when outside help is needed.

Appendix B– ctd.

methodology used-	Students learn through Action Research in Environmental Education and experiential learning.	1 year process (6 months to 2 years) for communities to conduct a holistic analysis of potential tourism activities.	Community-based experiential learning for students. They do some capacity development in communities but this is not the focus of their work.	Demonstrating good practice models from different regions: 3 kinds of forest and 4 benefits (for house, fruit, fuel, soil/water conservation)	Build plans around three types: individual and family plan; community plan; and resources plan. This provides the basis of the learning structure.	Experimental and experiential learning approach.	Participatory, experiential, and holistic to promote cultural empowerment that is spiritually grounded.	They bring together heads of villages to gain support, then staff explain purpose of network to villagers.
teaching model-	Students research local conditions, and they present findings/ recommendations to community to develop action plan.	Provide capacity building for communities to work for CBT. Using PRA, field visits, and holistic analysis of tourism activities and market potential. Training provided on specific skills, and facilitation for decision-making is provided.	ISDSI facilitates a participatory process in each community to design their own course of instruction for the students. They use a PRA model and develop a participatory action plan. The students learn through experitiential and action based research/discovery.	Play + Learn = Plearn Sufficiency Model: Support the self/family first. Share with neighbors second. Sell to the market third. 5 day sufficiency economy curriculum	Self reliance and sufficiency philosophy. Learning Process is divided in three parts: Human; Management and knowledge; Natural Resources and Biodiversity.	Training for farmers on how to think about sustainability and self-sufficiency. Follow four basic needs: Food; Shelter; Clothing; and Medicine. "Make life simpler and it's easy."	"Spirit in Education Movement" principles: 1. Knowing Oneself, 2. Knowing Love, 3. Knowing Society, 4. Knowing Nature, 5. Knowing Beauty, 6. Knowing Knowledge.	No apparent teaching model.
staff-	1 permanent staff and additional staff contracted for specific projects	7 fulltime staff, working with over 50 communities	10-12 fulltime, 7-8 part-time working with 12-15 communities, and 33 host families in Chiang Mai	5 permanent, 10 workers	3 staff for learning centre, and team of village representatives provide regular work	5 permanent residents; 20 people in extended community	25 residents, another 15 staff working with community	1 coordinator, rest is voluntary work
funding-	Received early project support from the Ministry of Education and FAO. Have also reveived support from DANEADA. Contracted to manage specific projects, now both in and outside of Thailand.	Main support from the Thailand Research Fund. Communities get grants from CBT-I through TRF. Have received some funding from the EU.	Full operation cost come from the students' tuition fees transferred from their home universities in the USA.	The land was purchased privately by King, and the project was funded as royal initiative. Local governments will pay for farmers to attend courses at the center.	Established a community-funded grant system for the conservation network with interest paying for work at the centre. However, this currently does not cover full cost and they receive outside funding.	The land was purchased by Khun Jo with the support of some friends. They now make money from charging Western people on courses, but for Thai and other Asians courses are free.	Course fees cover the running costs for the courses. For projects run outside of the community, they have received grant funding. The community itself lives a self-sufficient lifestyle.	Major support (funding and human resources) has been received from the Thai Community Foundation.