

# PRACTICAL VALUE OF THE SYSTEMS-BASED EVOLUTIONARY LEARNING LABORATORY IN SOLVING COMPLEX COMMUNITY PROBLEMS IN VIETNAM

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## ABSTRACT

This paper provides initial reflections on the practical value of the systems-based Evolutionary Learning Laboratory (ELLab) through a case study on improving the quality of life for women smallholder farmers in rural Haiphong, northern Vietnam. The first five steps were implemented during 2013-2014 providing valuable results that have made both practical and theoretical contributions with substantial implications to community development. The approach and framework helped to identify and engaged right stakeholders in problem analyses and decision making activities. Fuzzy problems within the complex web of life of the women and rural households were uncovered using relevant systems tools through a guided ELLab process. The ELLab helped to build capacity of local people for taking ownership of the process and outcomes to guarantee sustainability and long-term impacts. It also facilitated true participation and co-learning amongst stakeholders, making transformative learning occur. Contributions to action research are discussed.

**Keywords:** Action research; Co-learning; Stakeholders; Systems approaches; Transformative learning; True participation.

## I. INTRODUCTION

Many community development efforts around the world have been focused on supporting resource-poor communities in developing countries where agriculture provides major livelihoods for the rural poor (Garcia *et al.*, 2006; Herren, 2011). People in these regions, mainly small farmers, have to face various challenges which involve multiple stakeholders, are multidimensional and interconnected. Those include, for instance, production risks, capital shortage, poor access to productive resources and services, limited access to lucrative markets, low literacy level, discrimination against women, and other cultural barriers (Bosch *et al.*, 2015; Trinh *et al.*, 2015).

Development efforts through the traditional approach of linear thinking, which tends to solve immediate (visible) problems in isolation without an understanding of the local contexts and participation of direct beneficiaries and related stakeholders that have posed many flaws, leading to various failures and even counterproductive outcomes (e.g. Ha *et al.*, 2015a;

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Khavul & Bruton, 2013; Lanchman, 1997; Paris & Chi, 2005). Consequently, chronic poverty, malnutrition, health problems and gender gap issues, etc. still persist in these regions, particularly in Sub-Saharan Africa and South East Asia (Bosch *et al.*, 2015).

Sustainable development entails the need for addressing all economic, social and environmental facets in an integrated way (Midgley & Reynolds, 2004) since one can lend strength to another and vice versa (Roseland, 2000). Such complex problems should be rather resolved through a more holistic approach. In which, an issue is analysed within its “interrelationships” with others and within a system where different factors are interdependent and many actors are involved (Ahsan & Gunawan, 2010; Ha *et al.*, 2015e, 2015f). The root causes of a perceived problem need to be determined to define systemic interventions, while unintended consequences can be envisaged and thus avoided by using a systems approach and systems thinking.

The failures of the so called “reductionist” approach have led to wider adoption of systems thinking around the world (e.g. Bosch *et al.*, 2014a; Bosch *et al.*, 2007; Ison, 2008; Jackson, 2003; Maani & Canava, 2007; Midgley, 2003, 2006; Nguyen & Bosch, 2012; Wilby, 2005). The approach provides a “*new way of thinking*” towards understanding and managing complex problems (Bosch *et al.*, 2013a; Cabrera *et al.*, 2008).

In this light, the systems-based Evolutionary Learning Laboratory (ELLab) has been developed and successfully applied in a number of contexts around the world (Banson *et al.*, 2015; Bosch *et al.*, 2014a; Bosch *et al.*, 2014b; Kiura *et al.*, 2013; Kiura *et al.*, 2014), particularly in development fields in Vietnam (Bosch *et al.*, 2013b; Ha *et al.*, 2014a, 2015a; Nguyen *et al.*, 2009; Nguyen *et al.*, 2011; Nguyen *et al.*, 2014).

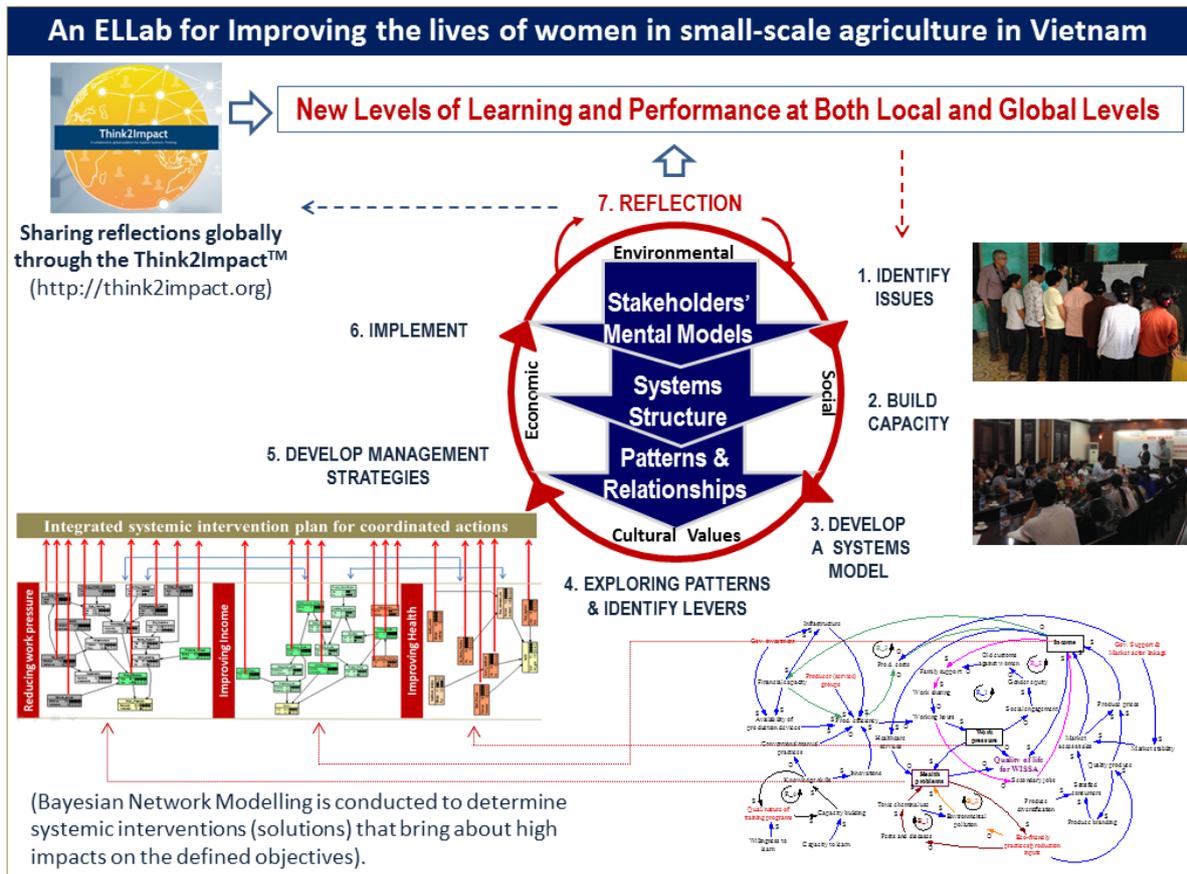
The purpose of this paper is to provide initial reflections on the practical value of the ELLab through a case study on improving the quality of life for women small farmers in rural Haiphong, northern Vietnam.

## II. THE ELLAB APPROACH, PROCESS STEPS AND KEY FINDINGS

### 2.1. The systems-based ELLab framework and process steps carried out in Haiphong

Under the auspices of the Bill and Melinda Gates Foundation through the Grand Challenge Exploration Grant, the project was initially conducted in 2013 with an “*original goal*” to seek labour saving strategies and innovations for women smallholder farmers in rural Haiphong (Gates-Foundation, 2013; Ha *et al.*, 2014a). A seven-step ELLab and its built-in systems tools (Vensim<sup>®</sup> and Netica<sup>™</sup>) were employed through the first five steps (Figure 1) to define the real challenges and needs of the target group and to formulate a systemic management plan to address the defined difficulties the women are facing.

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**Figure 1:** Applying an ELLab for improving the lives of women in small-scale agriculture in Vietnam – A case study for sharing reflections at both local and global levels (Modified from Bosch & Nguyen, 2014; Ha *et al.*, 2014b). *Notes:* the red dotted vertical arrow indicates lessons learned at the global level would further enhance approaches and performance at local levels.

The first step (*issue identification*) includes a baseline survey and a number of issue workshops and forums with women small farmers in four rural districts and relevant stakeholders (representatives of government departments and organizations, and input/service providers).

Key representatives of the stakeholders were engaged in practical “*capacity building*” activities (Step 2). Some of the trained members from a previous project in Haiphong (Nguyen *et al.*, 2012) were involved to assist the skills training. The purpose of this step was to improve understanding and to facilitate taking ownership of the process and thus outcomes (Bosch *et al.*, 2013b; Ha *et al.*, 2015a).

Using Vensim® software (Ventana®, 2011) enabled the working group to integrate all inputs (mental models) of the participants from the previous workshops into an interim “*systems model*” (Step 3). By exploring and defining “*patterns of relationships*” amongst variables within the system, potential “*levers for systemic interventions*” were defined (Step 4). Thereafter, the model was presented at a plenary workshop for feedback and modifications and/or validation.

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The refined model was then used to identify “*systemic interventions*” and develop a “*master management plan*” (Step 5) through Bayesian Belief Network (BBN) modelling (Cain *et al.*, 1999) to achieve the defined objectives from the previous steps.

As it turned out *raising income* via improved market access was defined as the most prominent issue of the women farmers. This cannot be addressed if potential agribusinesses are not engaged in the problem structuring and decision making processes (Bosch *et al.*, 2015; Ha *et al.*, 2015a). Therefore, follow-up market surveys and a number of workshops with agribusiness companies and the aforementioned stakeholders were conducted to understand the context in more depth and to redefine systemic interventions, particularly possible actions to facilitate contract farming and to improve production organisation amongst individual farmers.

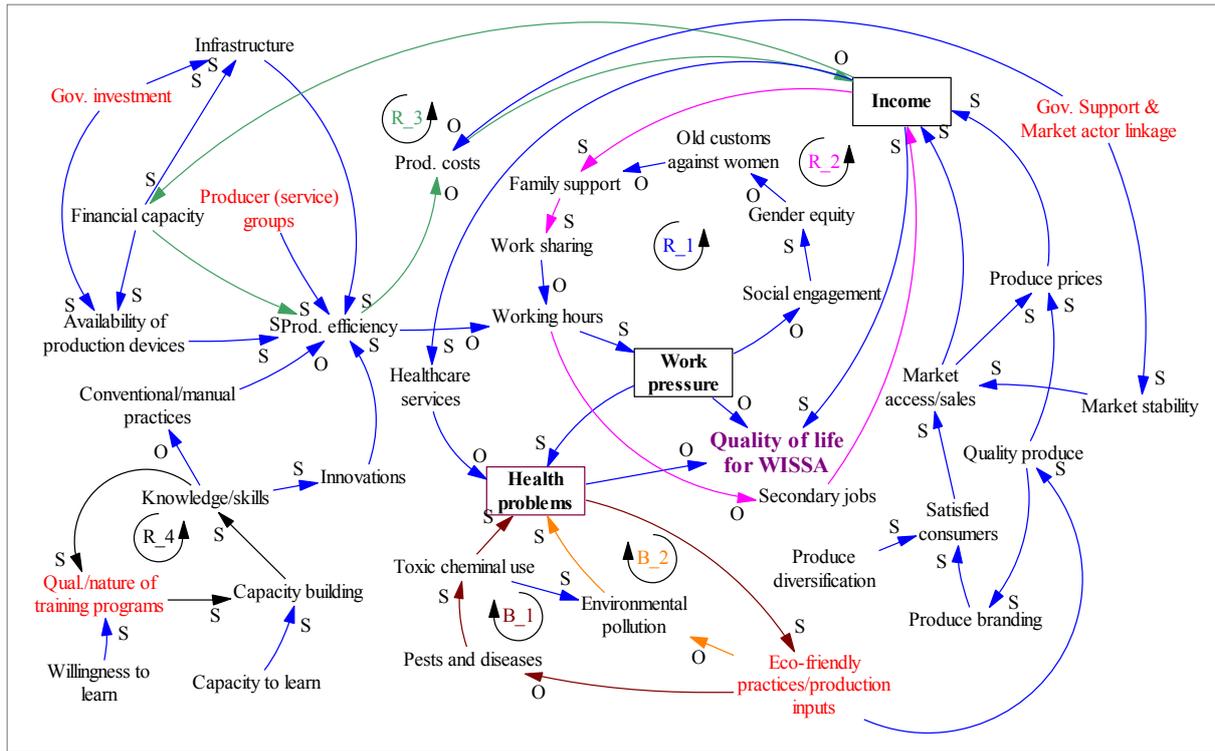
### 2.2. Key findings from implementing the first five steps

The baseline survey (Ha *et al.*, 2015b) showed various difficulties that the women are facing. These include their burdens of housework and production tasks, poor health and a relatively high level of domestic violence. These difficulties were found to be multidimensional and interdependent. The challenges are presented below in order of importance.

1. Poor income as a result of market access constraints and limited capital to invest in production (the women’s main livelihood);
2. Lack of production implements and unsafe working conditions/practices that engender heavy workload and poor health; and
3. Limited production knowledge and skills that influence production efficiency and thus poor income and health due to high labour input.

Issue workshops and follow-up activities of the ELLab process (capacity building and developing systems models) helped to produce a “big picture” of the current situation that reveals different determinants of the women’s lives under causal relationships (Figure 2). Raising income turned out to be the most urgent need, followed by reducing workload and improving health. Variables determining these three factors were found to be interlinked. The developed systems model enabled participants to explore patterns of relationships amongst the variables within the system and to determine leverage points for systemic interventions. Details are described in Ha *et al.* (2015c).

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**Figure 2:** CLD model for improving the lives of women smallholders in rural Haiphong. Red coloured variables represent potential levers for systemic interventions identified by participants during model interpretation. *Legend: S - same direction; O - opposite direction; R - reinforcing (loop); B – Balancing (loop); WISSA = Women in small-scale agriculture (Source: Ha et al., 2015c).*

Bayesian Belief Network (BBN) modelling enabled the participants to define systemic interventions in achieving three objectives, namely, improving income, reducing work pressure and improving health. Details of this step are discussed in Ha et al. (2015c). The BBN modelling comprised sensitivity analyses and testing of future scenarios, which allow the participating members to identify strategic actions for development of an overall systemic management plan. These actions include:

1. *Improve income* through improving market access, reducing production costs, and creating opportunities for secondary jobs;
2. Reduce *work pressure* by enhancing production efficiency through supporting production implements, capacity building, infrastructure, and production service groups.
3. Form and strengthen cooperatives/producer groups for enhanced market linkages, product volume and quality, reduced production costs, and many other benefits. See Ha et al. (2015d) for more details.
4. Improve *health* via reducing work pressure, improving and facilitating wider adoption of eco-friendly production facilities and practices, and enhancing rural hygiene and access to healthcare services.

Separate BBN models for the three component objectives were combined to develop a master systemic management plan (*Step 5, Figure 1*). Specific implementation plans with prioritized

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actions and allocation of responsibilities in each district will be formulated based on each particular context.

### III. PRACTICAL VALUE OF THE ELLAB

#### 3.1. Embracing systems approaches in practice

This study has proven the ELLab to be a powerful systems-based framework in managing such complex problems in rural communities due to its multiple practical applications and value. The systems approach employed does not merely seek solutions to the perceived (visible) problems of the target group, but it provides an opportunity to explore a “bigger picture” of the context (Figure 2). Places of interventions can be defined to improve performance of the whole system (i.e. rural households and communities) rather than the traditional palliative approach, which tends to solve immediate problems in isolation, due to the so called “silo and/or linear thinking” (Bosch *et al.*, 2014a).

By using systems approaches through the ELLab process, the project has identified the real problems that the target group is facing. The “perceived” prominent issue (labour hardship) as assumed by the funding body (Gates-Foundation, 2013) was not identified as the uttermost difficult hurdle for the women to overcome and was ranked second after poor income. The third factor determining their quality of life was health. The factors affecting these three determinants were found to be intrinsically interlinked with each other. These interrelationships and interplays reflect the reality of the women’s lives, which is complex and is influenced by all social, economic, political and cultural factors under the studied (environmental) setting (Figure 2). Therefore, seeking separate solutions to the defined heavy workload of the women cannot warrant their improved quality of life. Rather, a systems-based approach is needed to determine solutions to address the complex challenges and real needs in a coordinated manner.

The outcomes of this study served as feedback and a rationale for reframing the project goal and objectives to address the ‘real issues’, ‘real needs’ and thus appropriate systemic intervention strategies to address the identified challenges of the local women farmers. The findings have not only brought about practical solutions for the women (*social impacts on gender equality and rural lives*), but also formulated context-based recommendations for funding agencies and local governments. Details of the comparison between traditional and systems approaches are presented in Ha *et al.* (2015c).

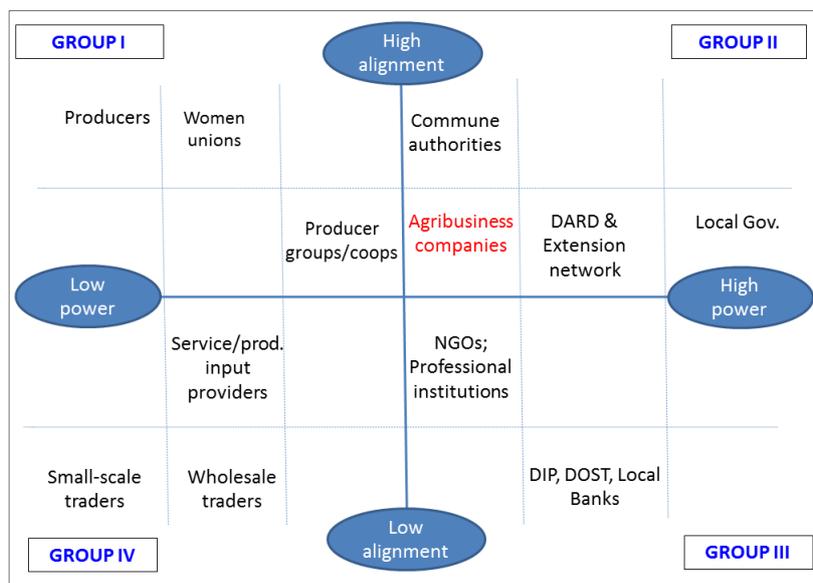
#### 3.2. The generic problem-solving framework with its built-in systems tools and a capacity building component

As a *generic framework*, the ELLab enables a large degree of flexibility to employ other management tools to support analyses of emerging stakeholders during the implementation phase. This helps to engage the right stakeholders for understanding the context in more depth, serving as a basis for defining appropriate interventions.

Since improving market access via enhanced market actor linkages were determined as one of the important preconditions for raised income (Figure 2), follow-up activities were conducted, including a reanalysis of stakeholders (Figure 3), a market survey of main

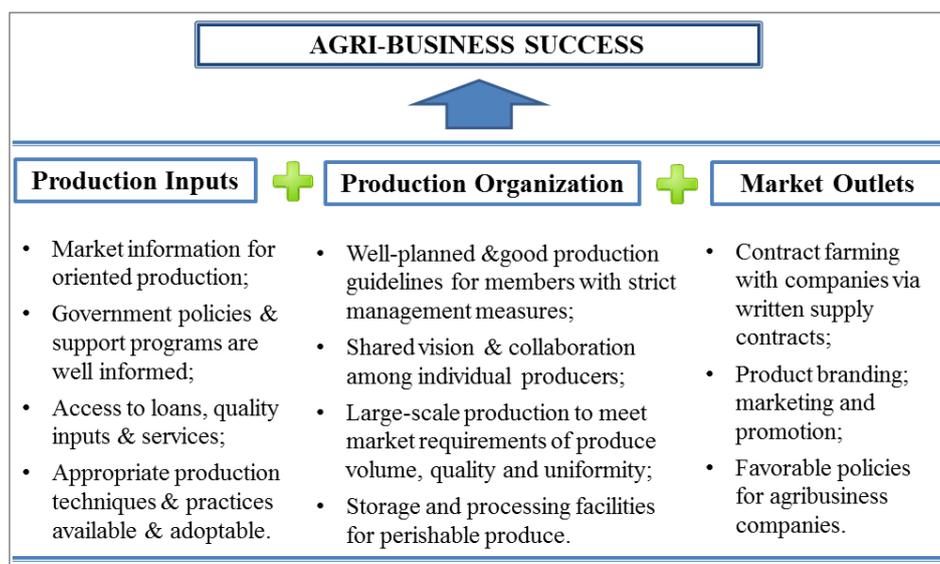
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agricultural produce, and engagement of agribusinesses in problem analyses and decision making processes (Ha *et al.*, 2015a).



**Figure 3:** Stakeholder analysis for improving market access and income for women smallholder farmers in Haiphong (Source: Ha *et al.*, 2015a). Notes: DARD: Department of Agriculture & Rural Development; DIP: Department of Planning & Investment; DOST: Department of Science & Technology.

The involvement of potential agribusinesses provided essential insights of the market potentials and current challenges to agribusiness success. Those consist of fragmented and uncoordinated production, low awareness and short-sighted visions amongst individual small farmers, and unfavourable policies for local agribusinesses (Ha *et al.*, 2015a). Discussions amongst the stakeholders have shaped a bigger picture of the requirements for agribusiness success of the smallholder farmers, which entail coordinated actions amongst the production services, organization and market access (Figure 4) (see details in Ha *et al.* (2015d)).



**Figure 4:** Requirements for agribusiness success in the rural districts of Haiphong – Vietnam (Ha *et al.*, 2015d).

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“*Capacity building*” for key stakeholders does not only occur in Step 2 as shown in Figure 1. It is designed in the form of learning by doing and Training of Trainers (ToT) throughout the entire guided process from problem structuring to systemic decision making and implementation. The purpose of this component is to ensure ownership of the approach, process and outcomes by the local people and thereby sustainability and long-lasting impacts. Thanks to the continued endeavors in embracing and institutionalizing systems thinking in practice in the situated context at both micro (community development) and macro (local government) levels, evident shifts in perspectives and therefore informed actions of the local government, related stakeholders and community members have been reported in Nguyen *et al.* (2014) and Ha *et al.* (2015a, 2015d, 2015e).

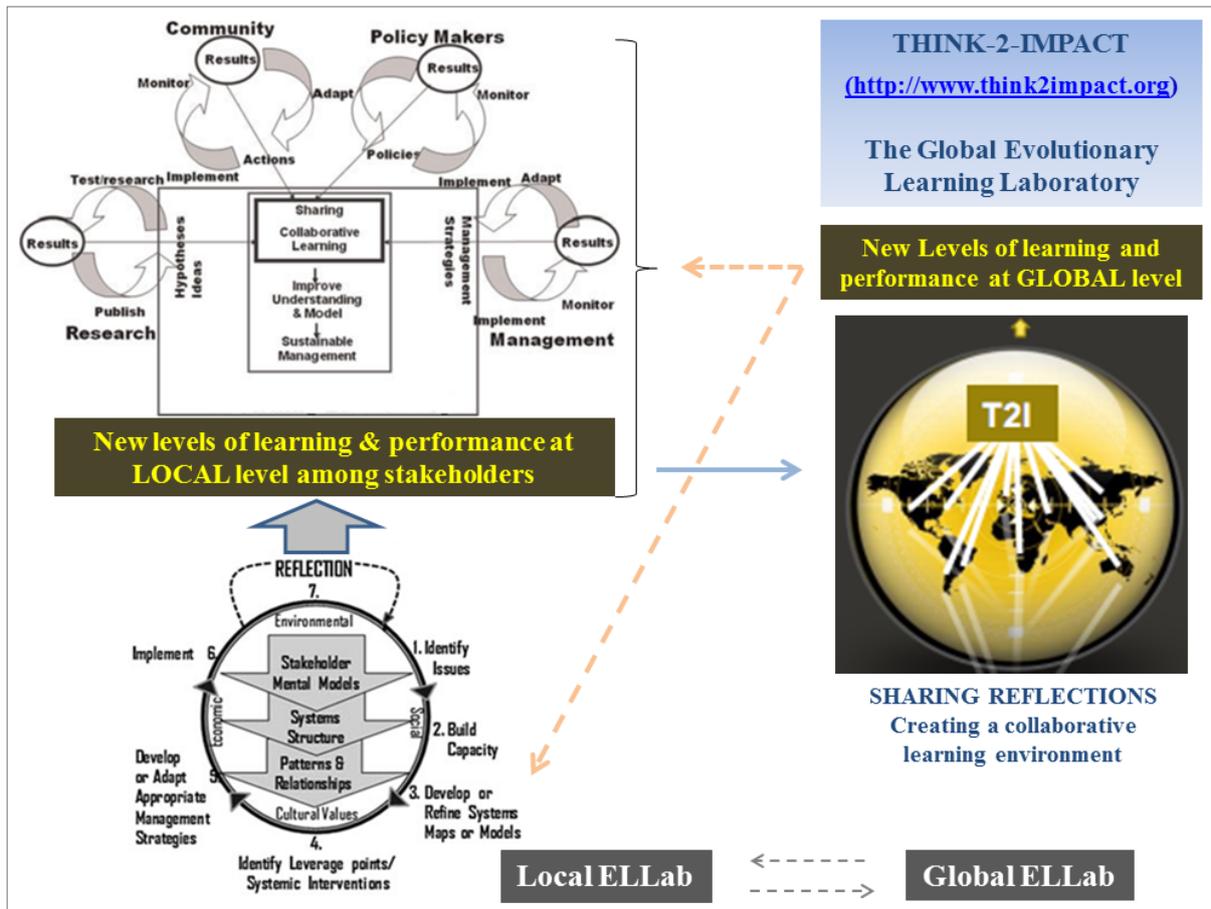
The built-in user-friendly *systems tools* in the ELLab enable all stakeholders to understand different issues and their patterns of relationships for defining leverage points for systemic interventions (Steps 3 & 4, Figure 1), while impacts and possible unintended consequences could be envisaged through scenario testing using the BBN modeling (Step 5, Figure 1). These are clearly more time and cost efficient than traditional problem solving approaches.

### 3.3. Facilitating true participation and co-learning towards joint action through the cyclic ELLab framework

The ELLab framework embraces a “*bottom-up approach*” and “*true participation*” since opinions of disadvantaged groups, local people and all other stakeholders are embedded in the systems models (Figure 2) that reflect their actual issues, concerns and expectations. Drivers and barriers to their defined goals are fully explored in the relationships. The framework ensures the “*inclusiveness*” of not only all relevant stakeholders (Figure 4), but also a holistic view on hierarchical systems relationships (i.e. women farmers, rural households and farming community), and different dimensions of sustainable development (i.e. *economic, environmental, social and cultural*) (Figure 2). The latter is consistent with findings of Midgley and Reynolds (2004) and Flints (2010).

The ELLab creates a “*co-learning environment*” for all stakeholders (Bosch *et al.*, 2013b). This was evident in this case study through triggering *mutual* and *transformative learning* amongst participants and thus appropriate systemically based actions by all the stakeholder groups (policy makers, government staff, agribusinesses and local farmers) towards strong collaboration and joint actions. It also helps to change the mindset of funding agencies (Ha *et al.*, 2015a). Regular reflections and sharing of lessons and experience at both local and global levels through the online knowledge hub Think2Impact™ (<http://www.think2impact.org/>) provide a continuous improvement in learning and performance around the world (Figure 5).

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**Figure 5:** New levels of learning and performance among stakeholders at local and global levels from an adaptive management perspective (Source: Bosch *et al.*, 2015).

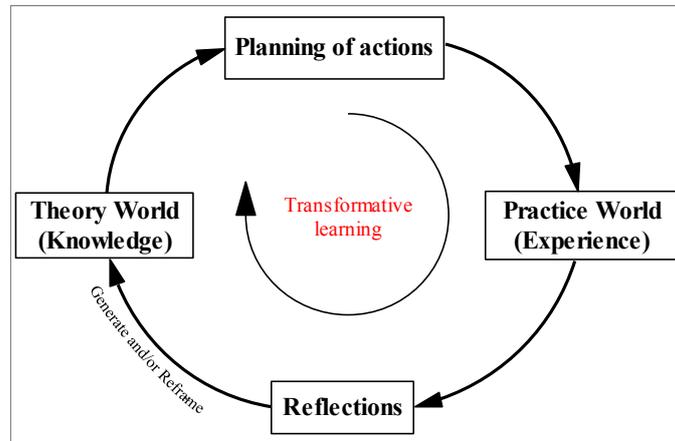
The participatory systems-based ELLab framework also reinforces action research (AR) through reflective activities, making sense of practical experience, and transforming viewpoints of stakeholders, resulting in more informed and justifiable actions. These are consistent with findings of Reason and Bradbury (2001), Coghlan (2002), Kemmis (2009) and Flood (2010).

It is, however, important to point out how the ELLab process differs from the traditional AR process. Sankaran *et al.* (2008) illustrate AR through a general model that links between “action” and “critical reflection”. According to these authors, the latter helps to gain better understanding and thus more knowledgeable action. AR is very often participatory and is conducted through a repeating cyclic or spiral process. The ELLab framework resembles AR in this regard. Nonetheless, due to its integration of systems tools and reflection mechanisms at both local and global levels through the global knowledge platform Think2Impact™, the systems-based ELLab is a powerful tool that further embraces and reinforces AR in dealing with complex problems in a collaborative and *systemic* manner. This is consistent with the statement of Ison (2008) with regards to the role of systems tools, techniques and methods in facilitating AR.

The philosophy behind the AR would be that there is a gap between the theory (knowledge) and practice (experience) worlds (Winter *et al.*, 2006). Reflections are essential to generate and reframe personal knowledge and perspectives about the real world and therefore

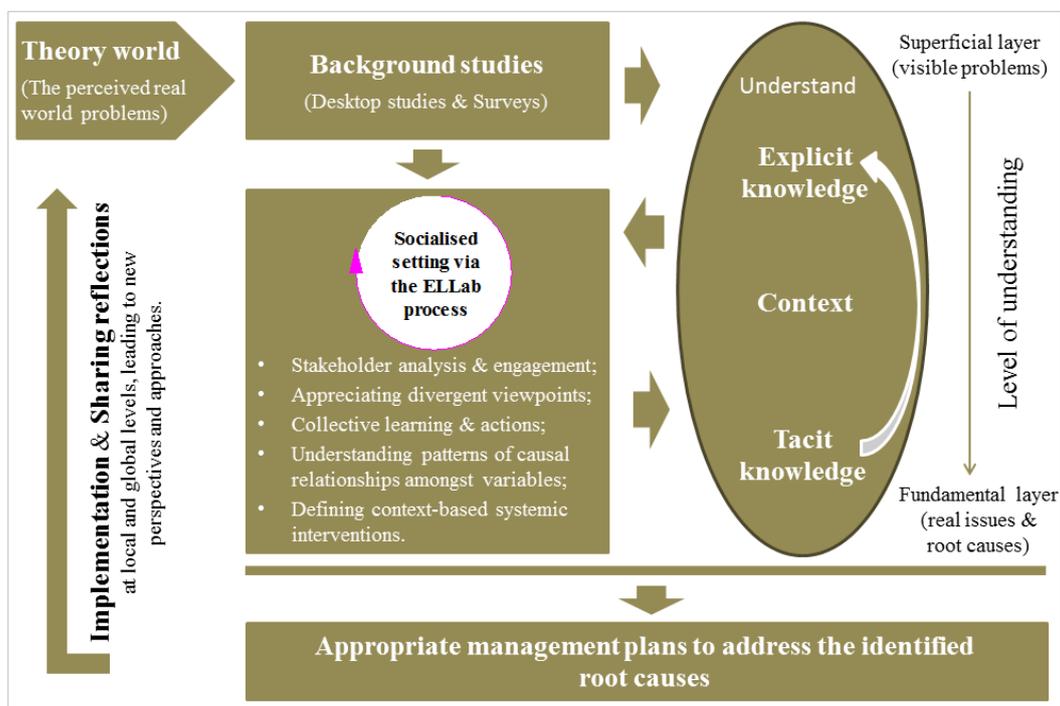
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appropriate approaches and actions (Figure 6). This process facilitates *transformative learning* amongst stakeholders (Ha, 2014a; Ha *et al.*, 2015e).



**Figure 6:** Transformative learning: Bridging the gap between theory & practice in professional fields (Source: Ha *et al.*, 2015e).

Through this case study, *mental models* and/or *tacit knowledge* of relevant stakeholders about the issues under consideration are uncovered and become visible as *emergent (new) knowledge* for sharing through the socialised setting of the ELLab process. The co-creation of knowledge helps to better understand the context and expectations of all stakeholders involved, leading to appropriate actions. The nature of continuous reflections through the ELLab process triggers transformative learning through transforming their perceived worldviews (Figure 7).



**Figure 7:** The knowledge creation process and transformational learning amongst stakeholders through the ELLab process (Source: Ha *et al.*, 2015e).

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The ELLab framework process significantly contributes to organisational learning theory via enhanced reflective changes in perceptions and thus the actions amongst stakeholders (Ha *et al.*, 2015a). Details of its contributions to project stakeholder and knowledge management are discussed in Ha *et al.* (2015e).

In addition to the continuous effort to disseminate systems science at the local government level (Nguyen *et al.*, 2014), this particular project have achieved profound impacts on the target group and stakeholders. Leaders of the local counterpart (Department of Agriculture and Rural Development) showed their high appreciation of the approach and method and initiated the integration of the defined systemic interventions into their future operational plan. Moreover, local farmers became ready to form formal cooperatives to enhance contract farming with potential agribusiness enterprises (Ha, 2014b; Ha *et al.*, 2015a, 2015d). These are clear evidence of perspective change and readiness to take informed actions amongst the stakeholders.

### IV. CONCLUSION

This paper has summarised the key value of the systems-based ELLab in dealing with complex community problems in Vietnam through the reported case study. Outcomes of this study clearly show the validity and advantages of systems approaches employed in the ELLab over the traditional supply-driven approach in solving intricate problems.

The flexibility of its approach has enabled the project team to reanalyse and engage the right stakeholders during the issue identification and decision making process. The built-in systems tools also trigger the process's effectiveness. The ELLab's capacity building component is designed to ensure ownership of the process, outcomes by local people and thereby sustainability and expanding impacts. Due to the nature of its generic process, the ELLab framework could be applied in dealing with complex issues in many professional fields across the world. Successes of its applications have been evident in Australia, Japan, Africa and Vietnam.

This study also confirms that the systems-based ELLab further enriches and reinforces action research through *employing relevant systems tools* and creating a participative co-learning environment amongst stakeholders. This helps to transform their perspectives and actions, making action research a truly "practice-changing practice" as stated by Kemmis (2009).

The further development of the ELLab to Think2Impact™ will expect to bring experience sharing amongst similar applications using systems approaches to a new level of collaborative learning and actions. Lessons learned of good practices and their impacts would be widely disseminated in the foreseeable future.

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