Real impulses of transformational learning in Mekong Delta, Vietnam

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To develop and enhance T-learning in the Mekong Delta of Vietnam, it is essential to find out real impulses of T-learning processes in this area. Based on primary and secondary data collected in our 2018 summer study and surveys, some key impulses of T-learning in the Mekong Delta are identified. They are as follows:

1. The first impulse: Economical and economical benefits provided by the VACB model

With the aim of reducing greenhouse gas emissions through the VACB model (V: garden, A; pond, C: livestock, B: biogas), in 2008 the Clean Development Mechanism rural development project (CDM projects) were piloted in over 200 families in My Phung Hamlet, My Khanh Commune, Phong Dien - Can Tho city. At present, Can Tho province has more than 400 farmers participating in the project effectively. "The more this model is multiplied, the more benefits the farmers receive. Each month they do not have to spend money on gas, electricity in cooking, lighting because of the closed model garden, fish ponds, Biogas pigsty. In addition, their income is increased by selling fish (one per year), selling pigs (2 times / year), selling fruit or vegetables" Assoc. Prof. Dr. Nguyen Huu Chiem[1] analyzed.

The CDM project installed 1,000 more biogas bags in Cai Rang and Binh Thuy districts in June 2012. With the scale is expanded, each year TP. Can Tho will reduce about 6,000 tons of CO2 emissions, contributing to significant harm reduction to the general environment. According to Dr. Chiem "*The feasibility study of the rural development model based on the clean development mechanism in the Mekong Delta" (CDM) by the Japan Center for International Agricultural Research (JIRCAS) and Can Tho University. Can Tho annually reduces more than 1,000 tons of CO2 emissions by guiding farmers to use biogas instead of traditional firewood*". From the above results, the Project Management Board is compiled a dossier of registration of "emission reduction credits" with the United Nations (UN), proposing the recognition of this clean production model as a basis for granting certificates. CER - Certified by the UN "Carbon Fund".

In the future, " carbon emission credits" will become clean products for sale to developed countries that want to cut down on greenhouse gas. Profits will be reinvested in the production of farm households. This is encouraging farmers to involve more actively in transformative learning in form of instrumental learning & communitative learning for sustainability to climate change adaptation.

With the CDM project's support hundreds of farmer households in Can Tho Province are planning to sell carbon credit from biogas production under a closed cycle of organic farming. Carbon credits will be reinvested to provide clean water systems using solar energy.

Duong Hoang Dung, owner of a pig farm with hundreds of pigs in Dinh Mon commune, Thoi Lai district, Can Tho, said: "Pork raising with hundreds of pigs like me without making biogas smells bad. From animal waste will affect the habitat of neighbors. Biogas help increase the efficiency of home economics, gas for cooking and lighting for pig farms ...".

[1] Lecturer, Faculty of Environment and Natural Resources, Can Tho University, a representative of the CDM project,

Fig.1: Can Tho farmers build biogas systems in their home gardens to develop clean agriculture, reduce greenhouse gas emissions

Mr. Dung's pig farm is designed and built following the VACB model provided by the Clean Development Mechanism (CDM) rural development project funded & jointly implemented by Cantho University and the World Center for Agricultural Research in Japan. (JIRCAS) . This is the first "carbon credit" investment project to be implemented in the Mekong Delta.

According to experts from the CDM project, the process of converting raw materials to carbon dioxide production is quite simple When farmers agree to build a biogas system, depending on the size of the household (ie the number of pigs in a household), it will calculate how much of the produce is produced. As a result, the expert will work with the farmers to convert the equivalent kilogram of firewood and CO2 emissions into the environment.

According to the CDM project, JIRCAS will invest the farmers in gardening with clean methods, minimizing the emission of CO2 into the environment. This emission reduction will be measured and converted to carbon credits. On average, every 1,000 farmers in Can Tho province participate in the program with 1,000 bags, biogas reactors are deployed, each year can generate about 3,000 carbon credits. With a stable carbon credit, in 2015 JIRCAS will market to the world to sell this credit.

"For the sale of carbon credits, we will support households to build water purification systems, use solar energy equipment, support agricultural cultivation .. and regularly hosts workshops with farmers to listen to their reflections, as well as to provide useful suggestions. Because the project included economic and environmental benefits, farmers were very enthusiastic to learn together in order apply and to develop the VACB as a sustainable livelihood solution adapting climate change challenges in Mekong Delta" Dr. Nguyen Huu Chiếm emphasized. .

2. The second Impulse: Undertaking experiential learning to approach and apply successfully the VACB model

Our studies show that experiential learning (learning by doing) is considered as one of the learning styles that local famers participated in the VACB model network in Can Tho City and Tien Giang province in the Mekong Delta of Vietnam most preferred and used most to approach, apply and develop their VACB model. This means that an emergence, existence

and development of the VACB model's that farmers previously did not know is closely tied to local farmer's experiential learning in which "knowledge" (technical and emancipatory) is created through the transformation of experience" (Kolb, 1984, p. 38). To accept, maintain and develop the VACB as a sustainable livelihood instrument, local famers in Can Thơ City and Tien Giang province have to carry out an experiential learning cycle with the four-stages such as *Experiencing*, *Critically reflecting the VACB*, *Choosing to apply the appriciated VACB model and Actively implementing the VACB* (Figure 1).

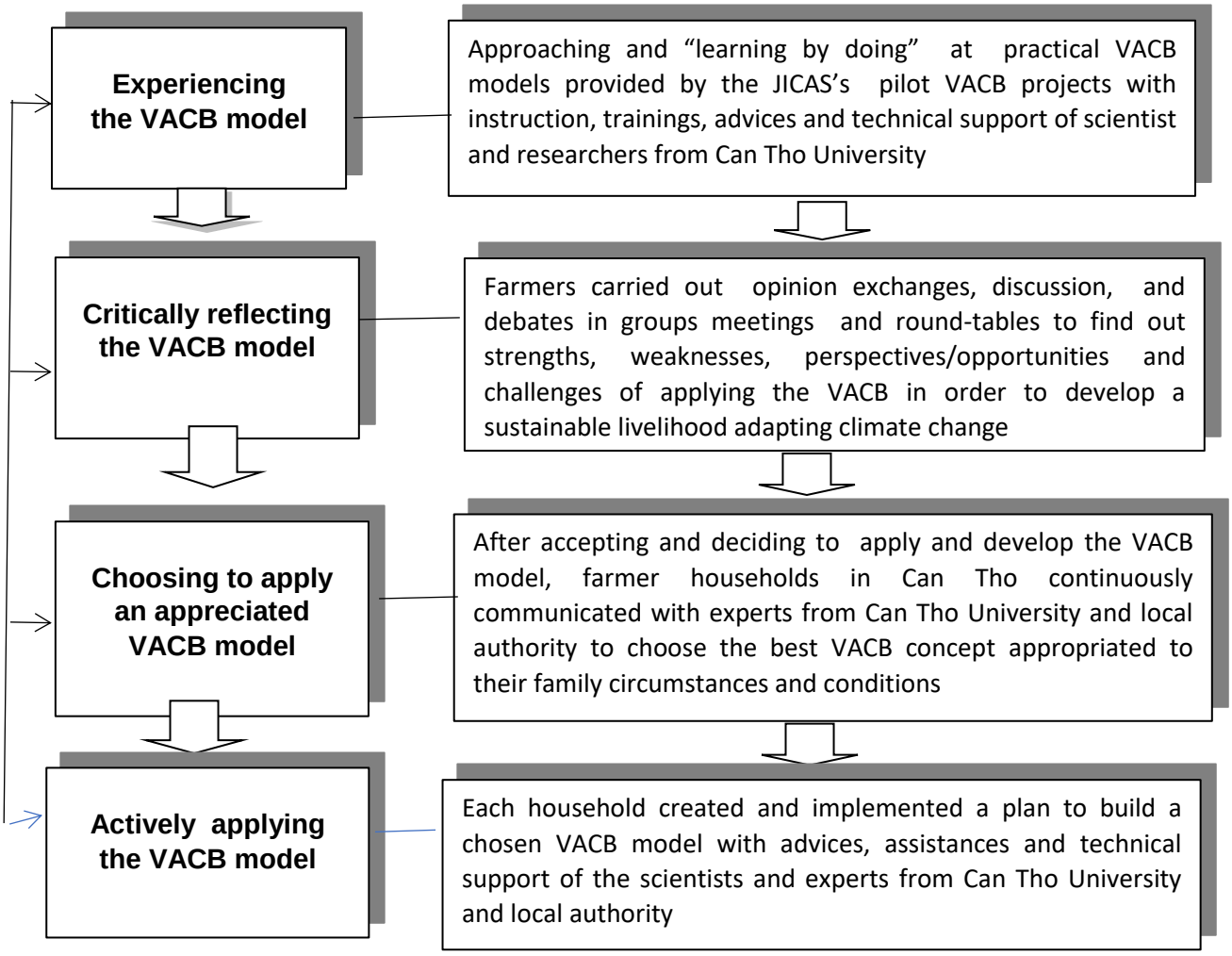

Fig.1: **Experiential learning cycle to approach and apply the VACB in Can Tho**

3. "Soái ca (best farmer)'s storytelling" – an effective transformative, transgressive learning method in Kien Giang Biosphere Reserve, Kien Giang province. Vietnam

Introduction: "**Soái Ca**" is Vietnamese word implying a best farmer who has a great reputation and a strong influence on the local farmer community in a particular agricultural sector This is a title that is granted to a respected farmer or an admired figure in a community or neighborhood. The title is not self-borne. It is voluntarily selected and honored by the community, thus it is not permanent. You can be a **Soái ca** in more than just one field, or you can also be replaced by someone else tomorrow. You get to share your experience in your field with others today, but tomorrow you get to listen to another Soai ca's story

Soái ca have valuable success stories or failure experiences to share with their communities. Storytelling is seen as a way of sharing experience within a community and it is a form of T-learning in a harmonic, democratic and effective learning society for sustainable development. This approach has been implemented in Kien Giang Biosphere Reserve in order to experiment T-learning in the context of climate change in Mekong Delta.

A Soai ca 's experience history is the collection and reflection of adaptation to climate change and sustainable transformation in Kien Giang Biosphere Reserve. The case study is written in accordance with collected materials which stimulates discussion and encourages critical thinking in learners. After that comes the designing phase of learning plans based on lessons learnt, forming concepts and taking actions to stimulate sustainability-oriented transformation. The study of the best farmer's experiences can also produce promotional materials to summarize success and failure stories, such as training materials, policy papers or publications on magazines and textbooks…

Below is one of the stories that has been shared. This is an example of a role model in agriculture:

Table 1: **A case study of a role model in Kien Giang**

Introduction	Mr. Pham Van Liem, 80 years-old, residing in Binh Hoa village, Binh Giang commune, Hon Dat district, Kien Giang province. Owner of a model of Avicennia aquaculture integrated with seafood farming in pond. Self-start up and model development for 20 years. No use of mobile phone.
1998	Cleared the land for constructing a pond culturing black tiger shrimp
1999	Fair harvest due to intensive and semi-intensive prawn farming plus with supplying black tiger shrimp seeds and food to another prawn farmings
2000	Poor harvest due to diseases, polluted water, insufficient tide water exchange, polluted water caused by excessive food, no water exchange making prawns weak and prone to disease.
2003	As hardworking as he was, but the return on investment was not high and the income was barely enough. Therefore, he decided to make a brave decision of reconstructing the pond by planting mangrove palms and mangroves, planting fruit trees and crops on the dikes, and poultry farming.
2004	Started the rice-shrimp farming model, the area of pond was over 2 hectares of which 1.2 hectare was reserved for shrimp

	farming, 0.6 hectare was for mangroves and 0.3 hectare was for fruit plants and crops.
2004-2005	Stable income, 50 million VND (Vietnamese Dong- the currency of Vietnam) per year in equivalent to 30 million VND profit per year, steady life.
	Analysis of success factors and failure causes: **Failure lesson:** Failure causes include subjective and objective ones: the heat was more severe than usual probably due to climate change, and it increased the water temperature. The water was also polluted added up by insufficient water exchange making prawns weak and prone to diseases. There was no sharing of experiences or lessons learnt. He did everything on his own, so the failures were quite extensive. **Success lessons:** Be patient and persistent, learn to adapt, share experience with neighbouring farms, particularly experience in highly effective heat-resistance methods for prawns by planting a vicennia and mangrove palms around the edges of ponds. This led to three income sources out of a 2-hectare area, prawn farming, crops and fruits along the dikes, and restored mangrove forests.

Conclusion: Storytelling of role models provides real experiences told by real people leads to a change in learners' ways of thinking, which is a goal of transgressive learning. The transformation process in the story line is presented in a chronological order making it easy to learn and to implement. This is the core of T-learning in communities where are heavily impacted by climate change and sustainable-development-oriented transformation process.

The history of experiences provided by **Soái ca** (best farmer) illustrates the cause and effect relationships of (a) experience timelines of major events and (b) links of causes and effects in the implementation process. Both outcomes are developed and amended to explain the process. Role models' storytelling method is greatly suitable with local people's traditional customs making T-learning highly effective.