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Transformative learning in resilient VACB model adapting to climate change in Phong Dien district, Can Tho city

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ABSTRACT

This study has assessed transformative learning in the VACB (V is orchard, A is pond, C is livestock and B is biogas) livelihood model of Phong Dien district, Can Tho city to propose solutions for maintaining and promoting transformative learning sustainably. Mxed method was used including surveys, interviews, focus group discussions and expert observation and discussion as main data collection. The study has obtained some following results. Firstly, the local livelihood in Phong Dien has changed dramatically. Secondly, there were seven different types in transformative learning in this area consisting of self-learning, and learning through workshop, training, model-observation, community activities, media tools and picking up. Thirdly, transformative learning process in Phong Dien faced a number of difficulties related to residents' aptitude and awareness, local government support, lack of information and learning space. Based on above difficulties and practical observation on the research issues, a number of solutions were proposed to promote transformative learning in Phong Dien including promoting representative farmers' roles, taking advantages of meeting, observing the information from television, internet and social network.

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1 TRANSFORMATIVE LEARNING, LIVELIHOOD AND VACB MODEL

1.1 Transformative learning

Transformative learning is a process of changing social perspectives and actions towards sustainable understanding, beliefs, and lifestyle. According to Mezirow (1997), in the transformative learning process people firstly change their understanding and perceptions, then they intend to change their actions in relation to their living environment. To

change human consciousness and actions, it takes time as people have to obtain knowledge and experience thanks to communicating and cooperating with others (Mezirow and Talor, 2009). Thanks to learning themselves and with other people, the human beings usually deal with their works more effectively. So it can be said that transformative learning needs to rely on both individual and social experience, in which people can learn and improve their lifestyle from not only success but also failure. The most important thing is

that transformative learning only takes place in case people communicate, learn and share with their peers or community in particular environment. Moreover, the transformative learning environment needs to support people to think, choose and make their decision (Taylor and Cranton, 2012). Besides, there are some essential conditions that influence transformative learning consisting of social, cultural and economic perspectives, individual and community understanding and information technology. Among them, transformative learning environment plays a vital role in three different criteria. Firstly, it needs to be a large geographic space. Secondly, learning space should consist of some different and complicated fields. Finally, this has to be a learning space for systematic thinking.

Three main components of transformative learning are transformative teachers, transformative learners, and stakeholders. Each of those components has its own importance that can affect transformative learning results. More specifically, transformative teachers play a main role in providing the community with new knowledge. Transformative learners are those who would acquire their new understanding. There are some transformative learners who are excellent in their learning process can play an essential role in supporting other learners. It is noted that in this learning process, the learners have to be active and in the center of their learning tasks to participate and share their ideas in most learning activities. Stakeholders are also necessary as they can support and encourage transformative learners to join in community learning tasks (Mezirow, 1997; Taylor and Cranton, 2012). Additionally, national and international companies and organizations, universities, vocational education schools and institutes should help both transformative teachers and transformative learners to carry out their roles.

Transformative learning is a process that people can experience their real-life situations consisting of individual and social aspects. In this learning process, they base on their emotion, attitude, perception, and belief about what they can be observed. Especially, they prefer to learn from doing what they have believed rather than seeing or listening. Hence, transformative learning enables mankind to change their perceptions and beliefs in order to improve their community in positive and sustainable ways.

In the agricultural field, farmers can be considered as transformative learners because they need to acquire new and better understanding on changing their livelihood as well as improving their environment. In this study, T-Teachers

(Transformative Teachers) consist of experts and scientists who can provide their community with more reliable and helpful information about environment and economy. Stakeholders are those who are local governments, functional officers in agricultural fields and other local unions. It is stressed that to form and develop transformative learning in a rural economy, people must actively share their knowledge and experience (Percy, 2005) as well as learn from other farmers' practical activities (Taylor and Cranton, 2012).

1.2 The VACB livelihood model

1.2.1 Livelihood

Livelihood is a concept used in many different forms and levels. It can be understood that "Livelihoods include capacity, assets, approaches (reserves, resources, ownership, usage rights) and activities which are necessary for human life" (Robert, 1983). In the DFID's (Department for International Development) Sustainable Livelihood Analysis Framework, "Livelihoods include capabilities, assets (including physical and social resources) and activities that are essential for living" (DFID, 1999). According to Tim et al (2004), a livelihood can be considered as a sustainable model when it is responsive and resilient with other impacts, or it can foster human abilities and assets in developing economy at the present and in the future as well as does not undermine the foundations of natural resources. In other aspect, Koos (2000) explains that a livelihood must depend on the possibilities and possessions (both material and social resources) and activities that are necessary for earning. The livelihood can be sustainable when it is able to support people coping with and recovering from any impact, and it can also accumulate or enhance human possessions as well as does not damage on natural environment (Hanstad *et al.*, 2004).

1.2.2 VACB

In this study, the livelihood of VACB can be considered as a sustainable livelihood model because it basically meets the livelihood needs of Phong Dien community. In other words, VACB model not only helps local communities to respond to climate change but also ensures human income as well as protects living environment. Specifically, this method of cultivation includes V is orchard (fruit, vegetable), A is the pond (freshwater fish), C is livestock (livestock and poultry) and B is Biogas (Gas is used in the family). It can be asserted that VACB livelihood model is understood as ways in which people earn their living in Phong Dien district, Can Tho city. Specifically, farming

activities in Phong Dien include rice and fruit planting, animal husbandry, natural resource exploration, etc.

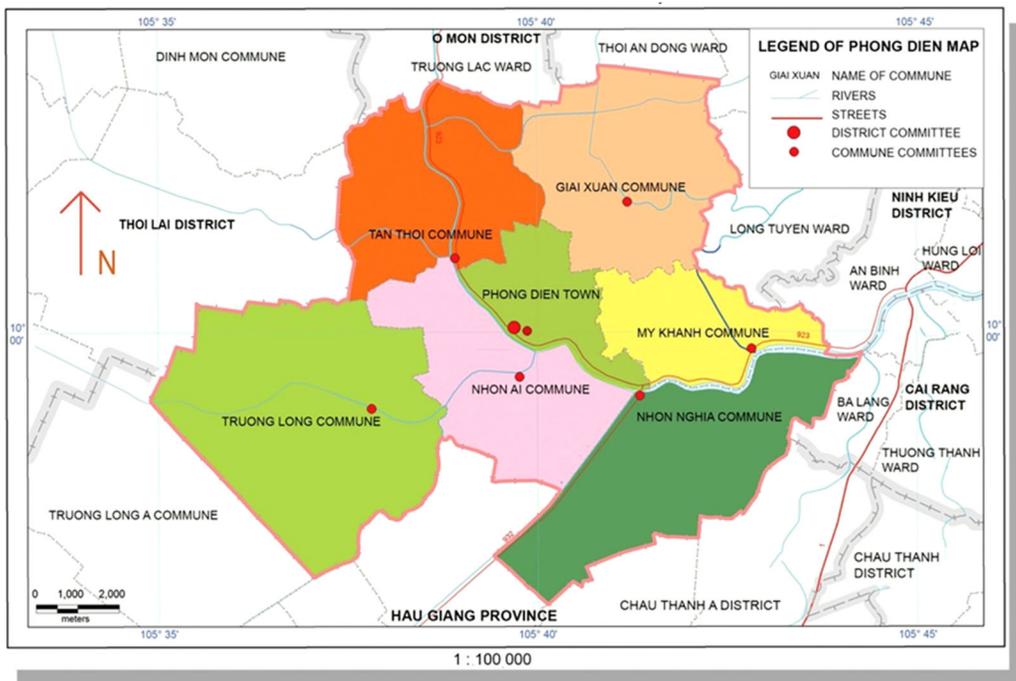
2 THE INTRODUCTION TO PHONG DIEN DISTRICT

Phong Dien is a suburb district belonging to Can Tho city located in the Mekong Delta region of Vietnam. In general, natural resources such as land, water, habitat, and climate provide Phong Dien with special potentials in developing agricultural economy (Nguyen Huu Chiem, 2012).

Environmental conditions in the study area have changed due to many reasons such as farming and living activities. This happened in a long time, so it caused a lot of harmful problems to the local life and economies. Specifically, more agricultural chemicals and wastes have been released into environment directly (Nguyen Huu Chiem, 2012). Based on residents' judgment, climatic variability has created a lot of changes such as erratic precipitation, hot weather, and more droughts. Those cause challenges to farmers in terms of their life and agricultural economics (Bui Thi Nga, 2009) as it is hard for the residents to adapt to huge

changes in climate. Sometimes, the creatures are endangered or grow slowly and abnormally. Therefore, it requires conducting transformative learning in order to provide people with more useful information and experience amongst farming households. Firstly, this supports farmers to obtain more knowledge about the environment and environmental change, especially climate change. Secondly, farming households can share their experiences with other people in developing appropriate livelihood models in their local land.

However, during the time that transformative learning can be employed in Phong Dien, there were a lot of difficulties in maintaining transformative learning forms effectively in relation to residents' awareness and aptitude, local governments' support and information limitation. This makes local farmers confused with choosing the way to continue their transformative learning. Especially, the local people have not satisfied with transformative learning's outcomes. Due to this current situation, clarifying reasons and proposing solutions play an important role in order to develop appropriate climate – resilient livelihood models in Phong Dien district.



ADMINISTRATIVE MAP OF PHONG DIEN DISTRICT, CAN THO

Fig. 1: Administrative map of Phong Dien district

Source: Designed by authors, 2017

3 RESEARCH METHODOLOGY

3.1 Research questions

- a. How was the VACB livelihood model formed?
- b. What were difficulties in implementing transformative learning in climate-resilient VACB model in Phong Dien district?
- c. What were the solutions to maintain and promote transformative learning in climate-resilient VACB model in Phong Dien district?

3.2 Data collection

Truong Long, Nhon Nghia and My Khanh communes were selected as research areas because the VACB model remains popular. In addition, there was different in the number of farmer households who are still implementing VACB model. In other words, current situation in conducting VACB model in these communes were not similar in outcome, technology and devise. With three different areas as above, this has supported the authors to gather reliable and diverse information.

In this study, mix-method was employed because it is believed that this can enable the researchers to obtain a profound research results due to diverse and helpful data. The respondents in this study are farmers, local leaders, university lecturers who used to take part in forming and developing VACB model in Phong Dien district. Thus, it is asserted that those respondents can provide the authors with rich and meaning full information.

3.2.1 Documentary study methods

In order to have a theoretical and practical basis for this research, academic documents in the field were collected and studied. Specifically, the collecting resources related to some different issues such as transformative learning (definition, components, conditions, and typical forms), climate change, (definition, expressions, causes and effects), livelihood and VACB model. The researchers have obtained the basic information about those issues from international and national books, journals, magazines, scientific yearbooks, and online forums which provided the authors with extensive and profound information. It cannot be denied that such understanding helped the researchers to approach research object easier.

3.2.2 Practical research methods Survey

In order to collect data for the study, the author have selected survey as a main data collection type which supported to collect a wide range information from

surveying 40 households in three different communes consisting of Nhon Nghia, My Khanh and Truong Long. It is believed that the survey helped the researchers to gather broad and comprehensive information as the survey subjects were in different ages, races, incomes, academic background, occupations, etc.

Interview

To collect profound information as well as increase the reliability for the research, in-depth interviews have been selected. Through this data collecting way, the study have selected nine different interviewing subjects including experts, leaders and representative farmers in My Khanh commune and Phong Dien district. Those subjects were in different occupations, ages and experience; therefore, they have provided the authors with comprehensive and diverse information. This can support to improve the study results' reliability.

Expert observation and discussion

It is asserted that experts are those who understand very well about the development of VACB model adapting to climate change as well as transformative learning through this model. This explains why expert observation and discussion have considered as an essential data collection in the study. The research group directly worked and discussed with some experts in the field to gather information on the following issues: the climate change and environment in the selected area, formation and existence of VACB model, local residents' reactions to adapt to climate change, and transformative learning in VACB model in Phong Dien district. Through observing and discussing with experts, the authors have obtained a lot of reliable and valuable information in assessing the transformative learning process in climate change – resilient VACB model in Phong Dien district

Focus group discussion

In order to gather deep and highly critical information, the authors have carried out focus a group discussion. In this case, at the same time 34 participants have discussed about specified issues related to research topic. This was organized that 34 participants were divided into small groups of 4 to 6 people in each group. The researchers have moved around to support and orient participants to discuss about mentioned issues. When it was necessary, the researchers have suggested content or questions for participants in order to give their perspectives. After discussing in small groups, they shared their understanding, perspectives as well as experience on the issues. In this focus group discussion, participants

were those who are experts, local leaders and farmers. Thus, the focus group discussion provided the researchers with highly reliable data for this study.

3.3 Data recording

In order to collect, store and prove the research results, a number of data collection tools such as notebooks, recorders, cameras and telephones were used in this study. It is true that the questionnaires and interview questions were important to guide the data collection as well as to assist the authors collecting comprehensive information. Notebooks, cameras, voice recorders and telephones were tools that have helped the researchers to store collected data.

3.4 Data analysis

In order to analyze the collected information, specialized software such as SPSS (Statistical Package for the Social Science), Photoshop (image editing software) and MapInfo (mapping software) have been used. In particular, SPSS supported the authors to revise information systematically, put data into different themes and explain the research results. Photoshop or MapInfo has assisted the researchers in converting collected information into charts, maps, and datasheets. Specifically, the author used the Descriptive Statistics / Frequencies command to import, analyze data, calculate statistics parameters as a percentage description and verify them through Compare Means / Independent - Samples T Test commands. After that, the authors aggregated data

and presented it in a tabular form. The analysis of data from SPSS software has provided the researchers with important and necessary information to create a practical basis for this study.

The researchers based on following process and technique in order to analyze collected data:

Step 1: Prepared and organized the data;

Step 2: Read through all data of interviews;

Step 3: Organized the material into segments of text before interpreting the meaning of data;

Step 4: Coded the data based on the meaningful segments and sort them into some different categories;

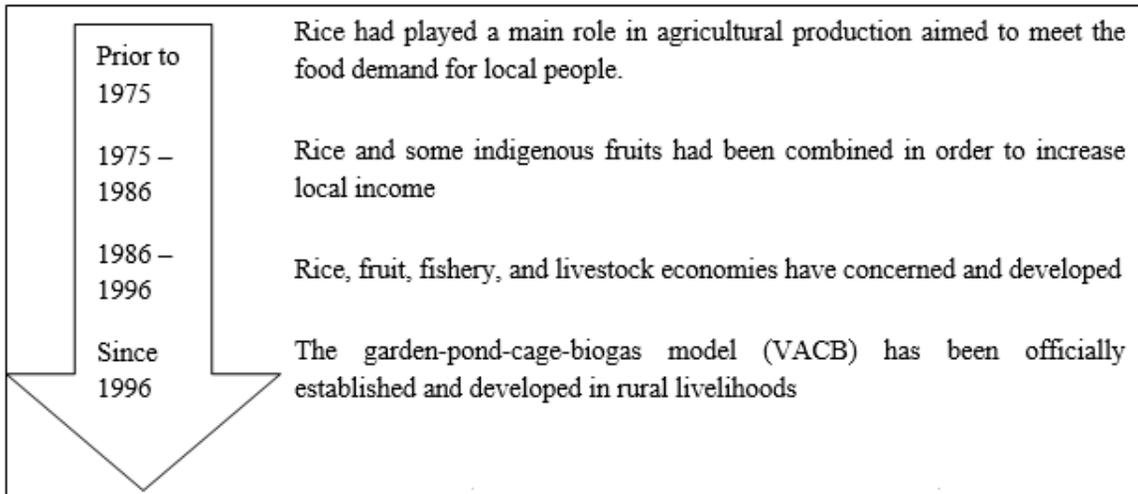
Step 5: Described the theme with typical meaning of each data sort. The researchers have focused on the main message of the category in each description;

Step 6: Analyzed and concluded on the research results.

4 FINDINGS AND DISCUSSIONS

4.1 The process of changing livelihood in Phong Dien

According to data collected from expert observation and discussion, it was found that the livelihood in Phong Dien changed significantly. In general, the livelihood change in Phong Dien is summarized as follows:



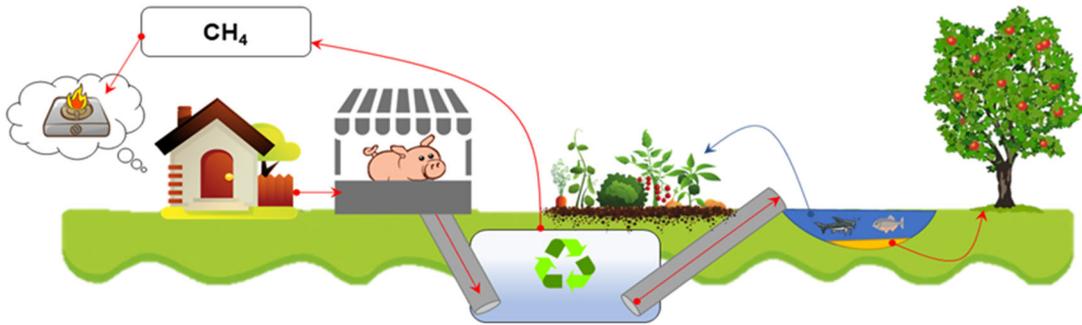


Fig. 2: VACB model

Table 1: Biogas distribution in Phong Dien district in 2016

Commune/town	The number of households with Biogas
Phong Dien	29
My Khanh	31
Nhon Ai	34
Giai Xuan	57
Tan Thoi	61
Nhon Nghia	75
Truong Long	169

Survey results in October 2017

4.2 Forms of transformative learning in Phong Dien

To maintain and develop the sustainable livelihood

model of VACB, some local people gradually changed their way of thinking, living in an open, progressive, practical and creative way. In other words, they have approached information and engaged in a variety of community-based activities to share information and experiences that were accumulated. The research results showed that the transformative learning in Phong Dien was conducted through seven different forms including self-learning, learning through workshops, learning through training, learning through model observation, learning through community activities, learning through media tools and learning through picking up (Figure 3).

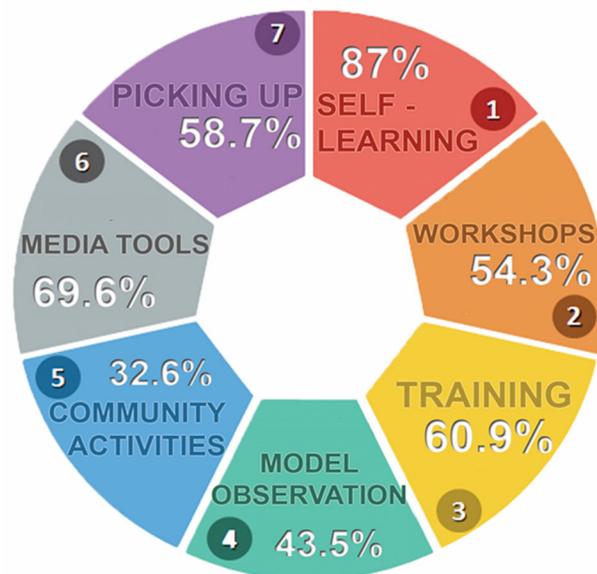


Fig. 3: Some forms of learning transfer in Phong Dien

Survey results of the study, n = 40 (October 2017)

The research results have shown that each form of transformative learning has its own characteristics and role in the local learning and sharing.

4.2.1 Self-learning

In the forms of transformative learning, self-study and self-reflection are more concerned with farmers

(87.0%). Since farmers find it difficult to believe other people and their thinking is less open, they tend to learn through self-observation and self-reflection. The process of self-observation and self-reflection is often based on practicality. In other words, they are hesitant to approach obscure and theoretical knowledge; instead, what can be observed and practiced is attractive to the local community. After the observation period, farmers try to get and check out results with what they have observed. At the workshop on Community Learning and Sustainable Livelihoods to Response to Climate Change in Can Tho City on October 12, 2017, Nguyen Van Hung (a farmer in My Khanh commune) shared *"To earn for our living as well as adapt to climate change, we have to learn from ourselves. We must save ourselves before someone else helps us"*.

It can be said that some farmers in this Phong Dien had a positive and forward thinking in coping with difficult problems. It cannot be denied that self-learning is a habit that is consistent with the cognitive characteristics of farmers in Phong Dien. In addition, rural lifestyles make farmers afraid to come and study in academic environments. This thinking is also appropriate because learning is to develop adaptive farming practices that require Phong Dien farmers to embark on practical things. In previous study, Percy (2005) concluded that in transformative learning process, people need to not only study themselves but also connect with other peer learning in order to exchange information and their practice actively. It can be implied that farmers' self-study activities in Phong Dien should be combined with other forms of learning.

4.2.2 Learning through workshops

In order to supplement knowledge and share experiences accumulated in rural livelihood development, workshops are opened by local authorities with institutes, schools, departments, international organizations, businesses, etc. In these workshops, besides listening, farmers also share and contribute their voices to leaders and businessman. This activity forms information sharing system among farmers and with others in their learning space. The research results indicated that workshops attract farmers to study at a rate of 54.3%. Mr. Nguyen Van Binh (a farmer in My Khanh commune) said, *"Thanks to the cooperation between local governments and other associations, organizations, and experts, we can learn from each other, especially we learn from people who have new knowledgeable and practical experience such as experts and lecturers. So I better understand about what climate change is and how to develop sustainable livelihoods model in order to respond to climate change"*.

According to Taylor and Cranton (2012), seminars and workshops need to be organized to attract stakeholders in the transformative learning process as stakeholders can provide people with useful and practical information. In this circumstance, it is true that opening workshops is to provide local people with basic scientific and necessary information. It is important for farmers to improve their understanding about the natural environment in general and climate change in specific. It can be said that when local people can know about their locality well in terms of natural conditions and potentials, they are able to develop their livelihoods effectively and efficiently.

4.2.3 Learning through training

Similarly, transformative learning through training is also attended by a large number of households (60.9%) due to constraints of local community management and education. In addition, the training is attended by many farmers as it responded well to practical needs of local livelihoods. For instance, training sessions usually introduce new livelihood models, practice advanced cultivation methods or experience which can help farmers to better adapt to climate change. According to Le Hoang Thanh (a farmer in My Khanh commune), *"Learning through training has somewhat escaped vague and abstract knowledge; therefore, I am interested in this learning form"*. So many farmers in Phong Dien appreciate and enthusiastically support to maintain and develop this form of transformative learning.

From survey and interview results, it is asserted that as transformative learning through training is not taking place frequently, so they did not have enough chances to learning and practice in applying new farming models. Besides, those training activities are usually organized in certain locations; therefore, local farmers sometimes find it hard to join in. In the future, it is suggested that local government should pay more attention to how to open more training courses in different localities. However, training will cost a lot of money and effort, so local authorities and agencies need to consider and prepare carefully to achieve the expected effectiveness. Especially, there should be a qualified and experienced workforce in organizing and conducting training (Mezirow and Taylor, 2009).

4.2.4 Learning through model-observation

Transformative learning in Phong Dien is often associated with the introduction of new models to adapt to climate change, so the form of learning through model-observation is also attractive to local human. However, this type of learning is not very common as there are only 43.5% of households who

participate in. Specifically, farmers can visit Biogas or VACB livelihood model which is made by representative farmers. They come to neighboring areas to observe, learn and exchange with other farmers in order to understand how to implement sustainable livelihood models. Combined with training and self-learning information, farmers try to do on their own agricultural economy. Mr. Cao Van Hai (a farmer in Truong Long commune) said that *"There are few models that can support local people to maintain their climate-resilient agricultural activities; however, some of such models have not worked effectively. So I do not have enough opportunities to learn through observing typical models"*.

It is sincere to state that although this form of learning is not common due to complex and inconvenient space and time, it provides people with more chances to learn authentically. In particular, many farmers can see and learn useful methods as well as check out results of typical livelihood models. Thus, this type of learning is helpful and reliable so that some farmers believe in and follow. Although there were no previous studies that demonstrate how model learning is useful, we can also acknowledge that learning through model is one of the most practical forms of learning. Therefore, local authorities need to create more conditions for farmers to study in this form.

4.2.5 Learning through community activities

Learning through community activities is less common due to difficulties of sharing information and changing farmers' perceptions and belief. In particular, there are only 32.6% farmers who usually participate in this study. The reason is that peasants find it hard to accept other perspectives, especially accepting unverified theories. Farmers argue that the contents of community activities are theoretically insufficient and are not attached to the need for livelihood development, so they do not want to participate in. In addition, the dispersion of habitat, the inconvenience of traffic, the difference in leisure time, etc. are major obstacles to this form of learning. Pham Dieu Linh (a member of the Women's Union of My Khanh commune) said *"It is true that Phong Dien district is one of rural areas with difficult conditions, especially about infrastructure and information technology equipment. Therefore, accessing and transferring information to farmers through community activities are limited"*.

According to the study findings, Phong Dien does not have diversified activities in the community learning centers or spaces. Furthermore, community activities take place with lack of practical and up-

dated information to suit real situations in developing livelihoods. They were reasons why some farmers do not want to join in community learning task. To form and promote helpful community activities, it is strongly believed that local authorities should coordinate with other organizations to design and organize activities that can provide local residents with more practical and necessary knowledge and practice. Based on Mezirow and Taylor (2009), the human transformative learning process only takes place when they are exposed and exchanged in their communities. From this point of view, it can be stated that Phong Dien farmers must inevitably participate in community activities to learn from each other and share their experiences in agricultural cultivation. It is true that farmers themselves need to change their thinking and opinions to receive and trust others in a critical way (Mezirow, 1997; Nguyen Duc Ngu, 2008).

4.2.6 Learning through media tools

Learning through media is useful to many farmers at the rate of 69.9%. This type of study is popular because of abundant free time in rural areas and the habit of accessing information associated with television programs is quite common. Mr. Vo Hoang Nam (a farmer in Nhon Nghia commune) said *"Watching television is convenient because it does not have to take time and effort to obtain reliable information, so every day I and my family spend time on watching television"*. Starting from their own needs, people are often interested in reports or programs related to the local livelihood. Thanks to this, they can learn and enrich their understanding in order to develop their family's livelihood.

In fact, because technology equipment such as radio or loudspeaker is limited in many learning activities in the community, the use of television for both entertainment and study is essential. Once the basic information is obtained, the farmer can meet and discuss about what they have acquired in order to better understand. The result is that local farmers can share what they have known about farming works as well as livelihood models. Taylor and Cranton (2012) asserted that one of essential conditions that influence transformative learning is information technology. This implies that improving the media tools in Phong Dien district will support people to learn and share information more effectively. Therefore, the local and national government needs need to pay more attention to this if they want to promote transformative learning process quickly and effectively.

4.2.7 Learning through picking up

It is interesting that many households view learning through picking up as a good and effective way of

learning (58.7%). They have habits in observing and contemplating activities from other families or communities. After that, they try to do on their own economy so that they can build up their beliefs and change their mind. Based on Le Hoang Thanh (a farmer in My Khanh commune), “I learn by this way because I can observe and verify results from other farmers”. This implies that if farmers do not observe in real situations, it will be difficult for them to believe and follow.

The interview results have shown that learning through picking up is carried out purposefully because it just take place when farmers need to learn about livelihoods. Such learning form helps farmers to be self-aware and active in learning flexibly according to their needs, so they save time and are not bored during the learning process. Although no research has concluded that learning through picking up can supports residents to study well in transformative learning, the study showed its role in learning and sharing experiences to farmers in Phong Dien. Therefore, this form of learning should also be maintained but local authorities and stakeholders should supervise and participate in such learning activities in order to support local people. That will help farmers to orient content and learning methods in order to acquire good learning results.

4.3 Obstacles of implementing transformative learning in Phong Dien

4.3.1 Some difficulties on implementing transformative learning in Phong Dien

The research results have shown that there were some difficulties in implementing transformative learning as mentioned in below table:

Table 2: Difficulties on implementing transformative learning in Phong Dien

Difficulties	The rate of households facing difficulties (%)
Farmers improve spontaneously	69.6
Lack of government support	63.0
Lack of awareness	58.7
Distributed learning space	41.0
Lack of access to information	37.0
Limitation of information sharing policy	34.8
Short capacity	30.4

Survey results of the research team in October 2017

Farmers improve spontaneously

The spontaneous improvement of farmers without planning is a limitation for transformative learning

in Phong Dien district, and 69.6% of farmers have such comments. According to Mezirow and Taylor (2009), transformative learning needs cohesion and exchange information and experience between individuals and groups or amongst people in the society. Spontaneity in learning and experiencing livelihood activities makes Phong Dien farmers often difficult and easy to fail. In addition, spontaneity makes it difficult to organize, manage, and deploy. Spontaneity is characteristic of working principles that are ancient and backward in Phong Dien. This also affects learning process as well as livelihood changing in this local community in some negative ways. Thus, it needs to concern about how to make plan to guide local residents.

Lack of government support

There are 63.0% of farmers saying that support from local authorities is still limited, so this becomes a big concern in this case. The study results have shown that farmers do not receive much support from the government and local authorities in learning and exchanging information. Especially, under uncertain market conditions and rapid ecological changes, people cannot do anything in some cases because of lack of scientific and orthodox information. According to Taylor and Taylor (2012), in the process of transformative learning, stakeholders play an important role because they are one of key players in this learning process. Specifically, it is roles of local government, women's union, organizations, enterprises. They need to support people in providing knowledge, directing and organizing, facilitating the connection among scientists, experts and farmers. However, this support is still limited, the transformative learning and maintenance of livelihoods have certain obstacles.

Limitation of awareness

Some farmers argue that their perceptions are limited, so this is a major obstacle to the implementation of transformative learning. In specific, 58.7% of people agree that weak awareness hinders the development of community learning. Local farmers do not have a basic understanding of transformative learning and its roles in improving knowledge and developing farmer livelihoods. When awareness is limited, people do not participate in some learning activities. Mezirow (1997) states that in order to learn effectively, learners need to be more aware of transformative learning, and then they can gradually improve their perceptions of what they need to do. From this point of view, it can be concluded that limited awareness is a real barrier of transformative learning in Phong Dien.

Distributed learning space

The results have indicated that 41.0% of farmers have difficulty because of distributed learning space. It can be seen that living space and scattered cultivation make transformative learning space of the community impossible to concentrate. In other words, when the conditions of travel are more inconvenient, and leisure time is also very different between households, local farmers find it hard to take part in any community work. Space dispersion does not create conditions for people to connect and exchange, so transformative learning is also hard to be took place (Taylor and Cranton, 2012). One of factors influencing transformative learning process is space because even large learning spaces need to be focused. However, these criteria in Phong Dien are incomplete; therefore, this impacts on farmer learning.

Lack of access to information

As indicated, 37.0% of farmers realized the means of accessing information in the area is lacking, so they do not have enough information. Some farmers find that there are no local loudspeakers. Moreover, radio stations in the locality present information that is outdated. In addition, many farmers have a low income, so they cannot buy computers, phones with network connection which can support them to update knowledge. Therefore, in order to obtain this information, people often learn by themselves thanks to watching television, talking with neighbors or taking part in seminars or training. Mezirow and Taylor (2009) mention that in today's era, leveraging the achievements of science and technology in transformative learning is a right move. Thus, it can be deduced that the limitations of media system hinder the process of changing people's perceptions, beliefs and actions.

Limitation of information sharing policy

The information sharing policy is also another issue discussed by some farmers (34.8%). They argue that local authorities do not have good policies to share information properly and effectively. Often, information from the state or university is disseminated to the local government quite quickly and efficiently through workshops, training or official documents. However, local authorities do not have effective ways to bring information to farmers. In some cases, local leaders also have no way to help people sharing information with each other. In some situations, information shared between farmers is outdated, which does not guarantee practical value.

Short capacity

There were 30.4% of farmers complaining about the capacity of representative farmers who play a pivotal role in transformative learning. They argue that some farmers do not have a good knowledge, so information can be shared is not correct or lack of scientific basis. Due to capacity limitations, some representative farmers must rely on their own subjective thinking. On the other hand, sometimes unproven personal experience has been shared broadly. In that case, inaccurate knowledge and experience is spread rapidly among farmers. It can be concluded that the limitations of knowledge or experience impedes the transformative learning in Phong Dien.

4.3.2 Solutions to the problems

To overcome obstacles in learning and sharing information, many farmers actively explore and experiment with many different ways. The research interviews have shown that there were 4 ways that local residents have reacted to learn and share information in the climate change-resilient VACB model as follows:

Look to representative farmers

To overcome their difficulties, many farmers come to other people who are representative in the field in order to learn and improve their livelihoods. They said *"If you do not actively learn, nobody will come and save you. It means that we must save ourselves first"*. It is a totally positive and appropriate perception not only in transformative learning but also in the development of local livelihoods to adapt to climate change. Undeniably, climate change always occurs with different levels and manifestations, so transformative learning and changing livelihood are real needs in this case. Mezirow and Taylor (2009) and Taylor and Cranton (2012) noted that in transformative learning, it is important to realize potential and important learner who is called representative learner as they can support other peer learner in learning process. Therefore, it is useful and encouraging to find representative peasants to learn. Hence, farmers themselves have gone through a process of changing their mind and belief – important process in transformative learning.

Take full advantage of meeting

Some farmers take full advantage of meetings at parties, local markets or even family gatherings to share and talk about their livelihoods. In the culture of Phong Dien district in particular and Can Tho city or the Mekong Delta in general, the exchange of information at meetings is very common. For example, in birthday and wedding parties, farmers meet and discuss about issues in their living and doing

business. Through these activities, information and experience in livelihood development can be shared quickly. There is no doubt that the transmission of such information is appropriate to the actual situation of rural areas as it does not cost and leads to positive results of transformative learning. According to Mezirow and Taylor (2009), transformative learning process only takes place when people exchange and cooperate with others. In other words, those tasks enable them to share information and transfer practical experiences in relation to agricultural cultivation. So, farmers in Phong Dien should take full advantages of any meeting so that they can obtain better understanding in adapting to changing environment and doing their farming works.

Learn through watching television

Watching TV or listening to local radio stations is another way which can help Phong Dien farmers to get more information on climate change and their livelihoods in response to climate change. Le Hoang Thanh (a farmer in My Khanh commune) said *"We all have a television which is an important mean for us to have more information and experience. So, whenever we have free time we just open the television while lying down in order to entertain as well as study"*. It can be said that this is a way that supports local farmers to learn and improve their awareness on the issues. Moreover, information from the media is often censored, so the reliability is high so that people do not need to worry about information source. In transformative learning, information technology supports people to acquire academic knowledge through media tools; therefore, learners need to base on such tools to improve their understanding (Taylor and Cranton, 2012).

Access to the internet and social network

In other perspectives, small number of interviewees said that the Internet and social network also help them to get and exchange information and experience although this is not common practice. Mr. Tran Van Khoi said *"Today, technology is more developed and applied, so I can access to the Internet and get more new things to learn"*. In some cases, farmers are weak at information technology skills or do not know how to use technology equipment; they can rely on the support of other younger people. It is believed that this is a good and open response in thinking that can help farmers to access or share information together. This also means that they can learn more about climate change and how to develop livelihoods in response to climate change.

As such, it can be asserted that transformative learning is an inherent difficulty. The good thing is that

Phong Dien farmers do not stop thinking and working together in order to build up a community with shared information and experience. Although the demand for transformative learning has not really met, with what farmers and local government think and react is a bright spot in this case. It is hoped that Phong Dien community will be more active and positive in improving their understanding in order to respond to climate change as well as develop their livelihoods more effectively.

5 CONCLUSIONS

According to the research results, it can be concluded some main issues as follows:

- Transformative learning has been formed and developed in Phong Dien district for a long time due to the demand of learning and sharing information among local residents. This learning form has supported local people to obtain a lot of information about their livelihood as well as about climate change. Especially, transformative learning enabled Phong Dien's farmers to understanding about the climate change as well as how to change their livelihood in order to adapt to the change of climate and environment.

- In implementing transformative learning in Phong Dien district it still has emerged many difficulties that need to be solved. Such difficulties related to residents' low aptitude and awareness, limited government support, lack of information and learning space. It is noted that those difficult problems hindered transformative learning in Phong Dien.

- From the difficulties that farmers in Phong Dien have faced as well as from residents' understanding, a number of solutions were proposed such as promoting the roles of local representative farmers, taking advantages of meeting amongst farmers or between farmers and other stakeholders, observing the information from television, internet and social network.

To enhance and promote transformative learning, some recommendations are proposed as follows:

- Maintain and improve the representative farmers' capacity so that they can help other farmers in both carrying out local livelihood model and transformative learning activities.

- Organize more seminars and workshops to link and share information and experiences among farmers as well as to express their opinions.

- Improve information sharing system and social network to support local people updating more useful scientific information.

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