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Economic Analysis and Livelihood Improvement Strategies for Vegetable Cultivators in Svay Rieng and Svay Chrum Districts, Cambodia

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ABSTRACT
Smallholder farmers in Svay Rieng Province, Cambodia, play a crucial role in the country's agricultural sector, particularly in vegetable production. Despite facing numerous challenges such as limited access to resources, climate change, and market uncertainties, these farmers contribute significantly to the national food security. This study aims to explore the technical knowledge, technical adaptation and practices of vegetable cultivation, and to analyze the economic efficiency of vegetable cultivation of farmers in Svay Rieng and Svay Chrum districts, Svay Rieng province, Cambodia. The household survey was conducted on 92 farmers in ten target communities, with at least three types of vegetables planted by each household. The result revealed that nearly two-thirds of farmers have over nine years of experience in vegetable cultivation, with most receiving technical training from the HEQCIP Project team. Nearly 70% of non-target farmers received training from government agencies and NGOs. A high percentage of survey farmers (90% target farmers and 75% non-target farmers) share their technical knowledge and experiences on vegetable cultivation with their relatives, neighbors, and other farmers in their communities. At least three different types of vegetables were planted by each household in target communities, including onion leaf, cucumber, wax gourd, gourd, cabbage, luffa gourd, herbs, morning glory, eggplant, pumpkin, spiny, and long-bean. The percentage of farmers who applied techniques provided by the project to integrate with their experiences was high (76% target farmers and 52% non-target farmers). However, only 17% target and 11% non-target farmers adapted the full technical packages provided by the project. The survey found that 75% of target and 50% non-target farmers improved their livelihood status, with 50% using their incomes from vegetable selling for income generation activities, 80% for purchasing household materials and equipment, and 10% for repaying in-debts.

1. INTRODUCTION

Smallholder farmers in Svay Rieng Province, Cambodia, play a vital role in the nation's agricultural landscape, particularly in vegetable production. Despite facing numerous challenges such as limited access to resources, climate change, and market uncertainties, these farmers contribute significantly to the national food security. Vegetable cultivation in Svay Rieng is primarily a rain-fed activity, with farmers relying heavily on seasonal rainfall. However, the increasing unpredictability of the monsoon season due to climate change poses significant risks to crop production. Additionally, smallholder farmers often lack access to modern agricultural technologies, high-quality inputs, and adequate irrigation facilities. Consequently, their yields are often low, and their livelihoods are vulnerable to fluctuations in weather patterns and market prices.

To address these challenges, various interventions have been implemented to support smallholder vegetable farmers in Svay Rieng. These include the promotion of climate-smart agricultural practices, such as conservation agriculture and water-saving irrigation techniques. Additionally, efforts have been made to improve access to agricultural inputs, including high-quality seeds, fertilizers, and pesticides. Furthermore, initiatives have been undertaken to strengthen market linkages and enhance farmers' bargaining power. By providing training and

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technical assistance, farmers are empowered to adopt sustainable agricultural practices, improve their productivity, and increase their incomes.

However, significant challenges remain. The lack of infrastructure, such as roads and storage facilities, hinders the timely transportation and marketing of agricultural products. Furthermore, the limited access to credit and financial services limits farmers' ability to invest in their farms and adopt new technologies. To ensure the sustainability of vegetable cultivation in Svay Rieng, it is essential to address these challenges through a multi-faceted approach that involves government support, private sector investment, and community-based initiatives.

This study aims to explore the technical knowledge, technical adaptation and practices of vegetable cultivation, and to analyze the economic efficiency of vegetable cultivation of farmers in Svay Rieng and Svay Chrum districts, Svay Rieng province, Cambodia.

2. METHOD

Survey method was used in this study. Ninety two farmers in ten target communities were selected for conducting household survey (forty six farmers for each type—target and non-target). Sangkat Chek in Svay Rieng town and three communes (Kampong Chamlang, Tasous, and Chhoeu Teal communes) in Svay Chrum district are the research site. In total, twelve types of vegetables were cultivated by both target and non- target farmers, and at least three types of vegetable were planted by each household. Questionnaire was designed for interviewing the vegetable cultivators and focus-group discussion was organzied to discuss about the technical knowledge, knowledge sharing, technical adaptation and vegetable technique practices among farmers in target and non-target communities.

3. RESULT AND DISCUSSION

3.1 Technical Knowledge and Sharing

The survey found that 100% of targeted farmer used to obtain the training on vegetable growing technic while only 67% of non-targeted farmer used to obtain such training from government and NGOs. There are three main institutions provided this technical training, those are Svay Rieng University, Provincial Department of Agriculture (PDA), and other projects supported by different NGOs.

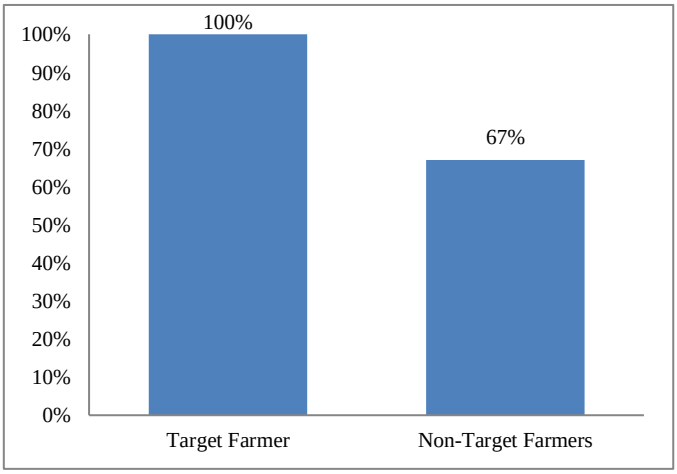

Figure 1. Percentage of farmers used to obtained training

Even some farmers do not received any technical training, the majority of them (almost 70% of each type of farmer ‘targeted and non-target’) have quite long experiences in growing vegetable, to say more than 9 years, 10% of both targeted and non-targeted farmer have experience from 6 to 9 years and about 20% of both targeted and non-targeted farmer have less than 6 years experiences.

It is significantly found that almost of target farmers have shared their knowledge and experiences on vegetable cultivation techniques (95%) while 75% for non-target farmers. Among those who shared to others, 44% & 39% of target farmers shared to family/relatives and neighbors/villagers relatively and 37% of non-target farmers shared to each family/relatives and neighbors/villagers.

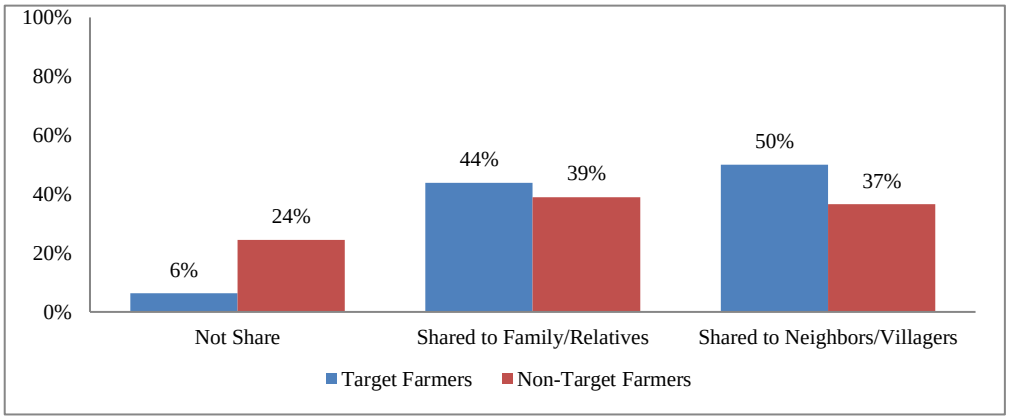

Figure 2. Percentage of farmers shared knowledge and experiences to others

The important topics they shared include varieties choosing, soil preparation, cultivation technic, fertilizer and pesticide usage, and taking care of the plant.

3.2 Technical Adaptation and Practices

3.2.1 Types of Vegetable Planted

There are twelve types of vegetable planted by interviewed farmers and at least each household selected three types of vegetable for planting. Table 1 below shows different types of vegetable cultivated by farmers.

Table 1. Types of Vegetable Planted by Farmers

Type of vegetable	Targeted Farmer			Non-Targeted Farmer		
	# of HHs	Dry season	Rainy season	# of HHs	Dry season	Rainy season
Onion leaf	22	95%	50%	12	100%	33%
Cucumber	35	97%	49%	32	91%	59%
Wax gourd	11	82%	55%	14	100%	57%
Gourd	8	88%	38%	8	100%	38%
Cabbage species	32	100%	25%	17	94%	24%
Luffa gourd	28	100%	54%	26	92%	50%
Herb	6	83%	83%	8	88%	57%
Morning glory	24	96%	63%	18	78%	61%
Eggplant	1	0%	100%	3	100%	33%
Pumpkin	6	100%	17%	9	78%	67%
Spiny	12	92%	75%	12	100%	50%
Long bean	26	53%	58%	23	98%	43%

The vegetables that were planted by most farmers (both target and non-target) are cucumber, cabbage species, job tears (Nor Norng), long-bean, morning glory, onion leaf. Both targeted and non-targeted farmers prefer to do cultivation in the dry season than the rainy season, given the reason that in the dry season they were easier to manage for example water management (not too much water), take care (grass clearing, adding fertilizer), easies to harvest and get better yield than rainy season.

3.2.2 Land Size for Planting Vegetable

About the land size, the survey found that mostly of both (target and non-target farmers) planted vegetable on the land size less than 500 square meters (40%) while there is only 2%-5% each planted on the land between 3000-4000 square meters.

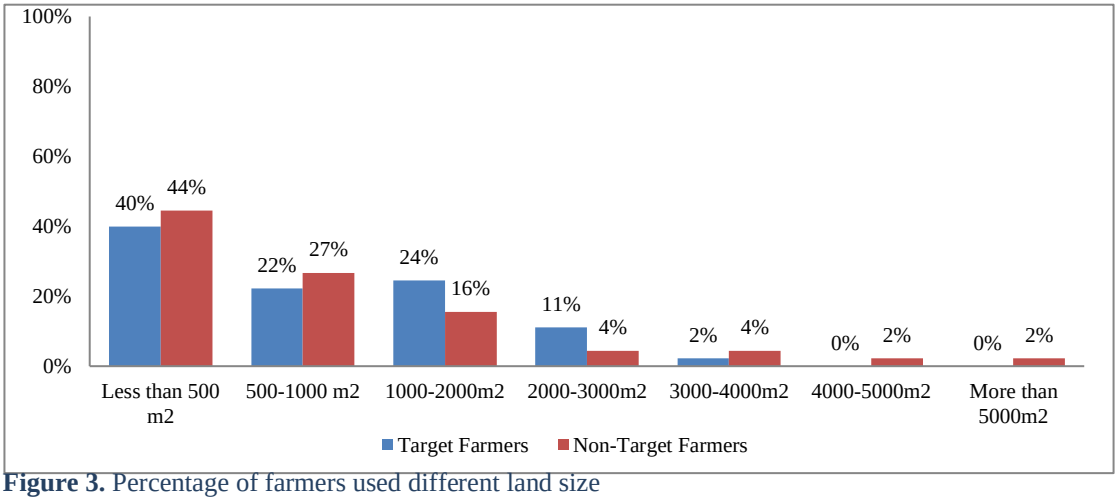

Figure 3. Percentage of farmers used different land size

Among interviewed farmers, almost 60% of target and 70% of non-target farmers plant vegetable on village land while about 40% of targeted and 30% of non-targeted plant on rice farming land (rice field).

3.2.3 Technical Adaption

The majority of targeted farmers adapted techniques that they have learnt to practice in their vegetable cultivation (17% adapted full techniques and 76% adapted partial while there was only 7% who still used traditional practices). For non-targeted farmers, the rate of who practiced with their traditional experiences is pretty high 37% while 52% practiced partial and other 11% practiced full techniques. The adaptation of full techniques is referring to since seed selection, soil preparation, fertilizer and pesticide usage, and planting techniques.

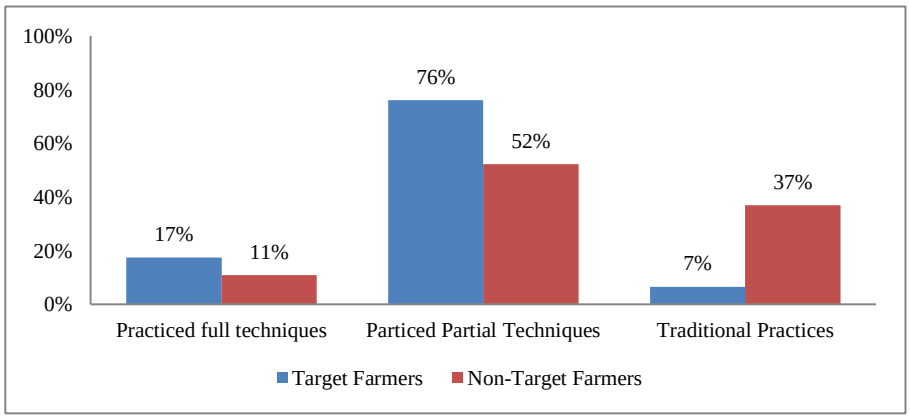

Figure 4. Percentage of farmers applied different techniques and experiences

There are some main reasons given why they did not practice, those included complexity of the techniques, raw material not available in community, required spending much more money and less profit.

3.2.3.1 Seed Selection

According to the result of the survey, 91% of targeted farmer have selected the quality seed before growing the vegetable while 80% of non-targeted farmer have done so for their vegetable cultivation. Deeper analysis proves that, 27% of targeted farmers have chosen vegetable seed based on the technical training they have attended, 37% of them have chosen based on their own experiences and personal understanding, 11% of them have chosen by discussing with neighbors and other farmers, and 25% of them have chosen base on the advices of the agricultural technical officers. On the other hand, the survey also found that only 18% of non-targeted farmers chosen the vegetable seeds based on the technical trainings they have attended, and only 14% of them have chosen based on the advices of the agricultural technical officers while the rest of them have chosen based on their own

experiences and personal understanding, by discussing with neighbors and other farmers and other methods with the proportion of 51%, 14% and 4% respectively.

The respondents have also described about the sources where they get the vegetable's seed, the result shows that 6% of targeted farmers got the seed from their neighbors or other farmers, 17% of them have kept the seed by their own self, 35% of them have bought the seed from the market, 20% of them have bought is from professional institutions or officers and 22% of them get from other sources. Similarly non-targeted farmers also got the vegetable's seeds from the same source as the targeted farmers with the proportion of 11%, 34%, 41%, 9% and 5% respectively.

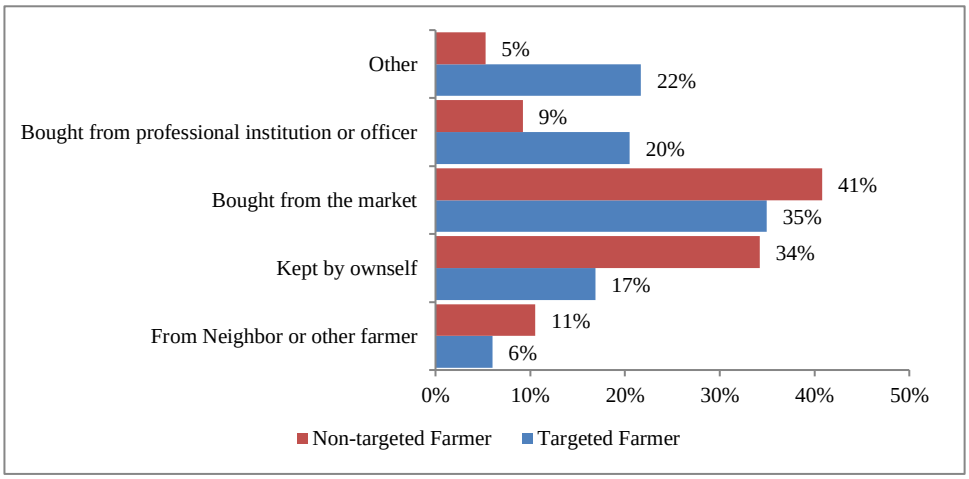

Figure 5. Percentage of farmers received seed from different sources

3.2.3.2 Soil Preparation

Furthermore the study also proves that all interviewed targeted and non-targeted farmers have prepare the soil before growing the vegetable and the respondents have added that the soil prepare are including some phases such us dry the soil, break the soil, create the ridge in the field, clean the grass and others.

3.2.3.3 Fertilizer Using

The project also wants to be aware about the fertilizer usage among respondents, no doubt the survey found all respondents (both targeted and non-targeted farmer) have use the fertilizers for their vegetable growing. Indeed, 100% of targeted farmers have used organic fertilizers or composts while 61% among them also used chemical fertilizers. No significantly different, all of non-targeted farmers also use organize fertilizers or composts of their vegetable growing while 76% among them also used chemical fertilizers. Table below presents the proportion of respondents who use the fertilizers for each type of vegetables which we can see that both targeted and non-target farmers prefer to use organic fertilizers than chemical fertilizers for their vegetable cultivation. In particularly, targeted farmers have greater proportion of using organic fertilizers than non-targeted farmers.

Table 2. Proportion of Fertilizer Usage on Vegetable Cultivation

Type of vegetable	Targeted farmer		Non-targeted farmer	
	Organic fertilizer	Chemical fertilizer	Organic fertilizer	Chemical fertilizer
Onion leaf	67%	33%	75%	25%
Cucumber	76%	24%	61%	39%
Was gourd	100%	0%	67%	33%
Gourd	100%	0%	100%	0%
Cabbage species	65%	35%	64%	36%
Luffa gourd	100%	0%	100%	0%
Herbs	100%	0%	100%	0%
Morning glory	100%	0%	67%	33%
Eggplant	100%	0%	100%	0%
Pumpkin	100%	0%	100%	0%
Spiny	67%	33%	75%	25%

Long bean	73%	27%	65%	35%

3.2.3.4 Pesticide Usage

At the meantime the survey also reveals that more than half of interviewed farmers (51% of targeted and 54% of non-targeted farmers) have used pesticide for their vegetable production. Indeed, 16% among targeted farmers who used pesticide have used it in flour form, 84% of them have used it in liquid form and 4% of them have used it in the other form. For the non-targeted farmers who used pesticide, 21% among them have used it in flour form, 79% of them have used it in liquid form.The respondents then have been asked about their feeling on the effective of the pesticide they have used, the study indicates that chemical pesticide have more effective than the natural one.

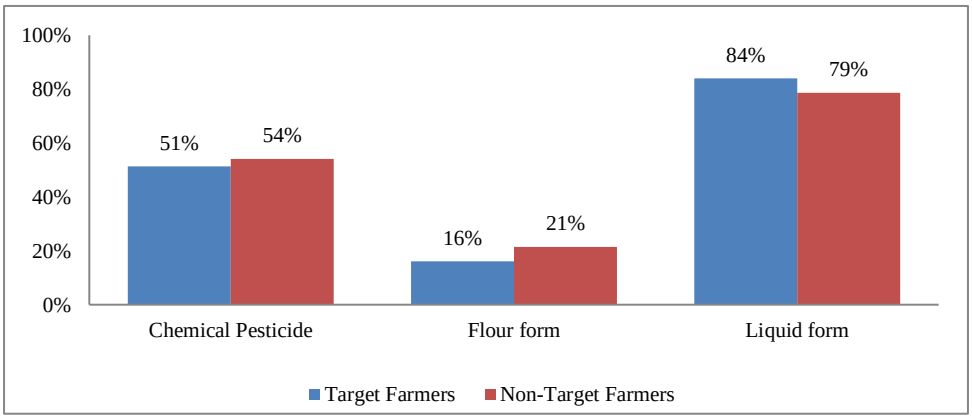

Figure 6. Percentage of farmers used pesticides on their vegetable cultivation

3.2.4 Problem Encountered

Doing farming activities always face various problems that could lead to partially and fully damages in some cases. According to the interviewed farmers, the main problems encountered for vegetable production are diseases, insects, lack of water, lack of capitals, poor technical, lack of labors, low price at the harvesting period and so forth. Table below presents the proportion of targeted and non-targeted farmers who face the problems with their vegetable production:

Table 3. Problems encountered by respondents

Problems encountered	Targeted farmer		Non-targeted farmer	
	Yes	No	Yes	No
Insect	93%	7%	93%	7%
Lack of water	16%	84%	7%	93%
Lack of capital	21%	79%	13%	87%
Disease	65%	35%	56%	44%
Lack of technical	28%	72%	24%	76%
Lack of labor	17%	83%	13%	87%
Lack of seed	16%	84%	13%	87%
Low price at harvesting period	42%	58%	40%	60%
Others	4%	96%	0%	100%

According to the table below, there are three main problems that both targeted and non-targeted farmers have mentioned that have occurred very often and strongly affect to the profit of their vegetable cultivation, including insect (worm, louse, ants and etc.,), diseases and low price at the harvesting period.

3.3 Family Economic Analysis and Livelihood Improvement

3.3.1 Expense on Vegetable Cultivation

Deeper analysis proves that respondents have spent their capitals on various things such as chemical fertilizers, organic fertilizers, seeds, gasoline, pesticide/insecticide, materials to make the vegetable garden and so forth. Figure below presents the percentage of targeted and non-targeted farmer spent their capitals on different things in vegetable cultivation.

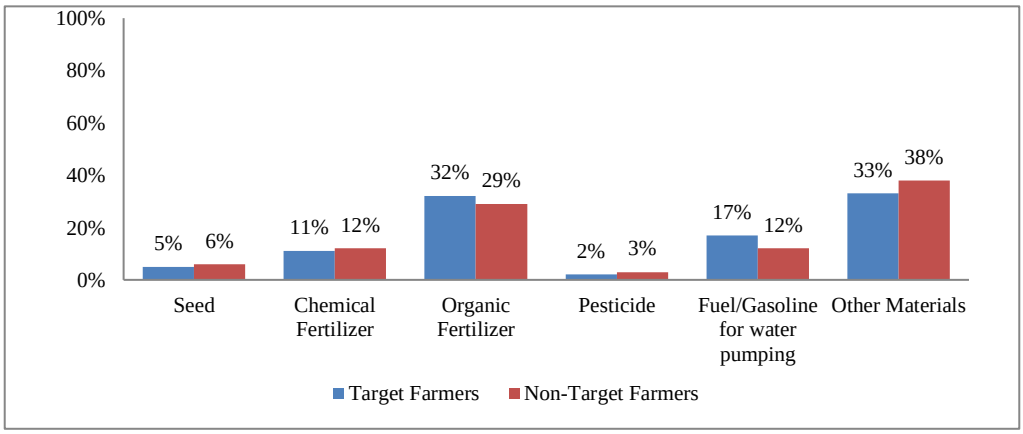

Figure 7. Percentage of expense items on vegetable cultivation

3.3.2 Profit Analysis

The average profits for target farmers per season is 379,608 Riels which is equal to 60%, compared with the expense, or 40% compared with the total income while the non-target farmers profits is only 40% (280,341 Riels). Table below presents the average profits of the targeted and non-targeted farmers.

Table 4. Profits gained compared to the expenses and incomes

Type of Farmers	Expense (Riels)	Income (Riels)	Profit (Riels)	% Profit vs Expense	% Profit vs Income
Target	627,125	1,006,733	379,608	60%	40%
Non-Target	710,342	738,683	280,341	40%	40%

In average, the profits gained from vegetable on farming land of less than 500 square meters is between 200 000-400 000 Riels (almost half of all farmers) while 65% of farmers (planted 500-1000m2) gained profits of more than 600 000 Riels, 72% of farmers (used the land size of 1000-2000 m2) gained more than 600 000 Riels and 57% for farmers using farming land of about 2000-3000 m2. Farmers who used farming land more than 3000m2 gain profits for more than 400 000 Riels.

Comparing the profits with the vegetable cultivated areas: in a general assumption, we could say the profits will be increased when the farmer has more cultivated land areas. To verify this assumption, we have cross-checked the profits with of the interviewed farmer and the result shows in figure 7 that the assumption is correct since most farmer (92%) have profit less than KHR 600,000 for those who have 500m2 of vegetable cultivated areas while up to 64% of those who have between 500 – 1,000m2 and 72% of those who have between 1,000-2,000m2 can make profit more than KHR 600,000.

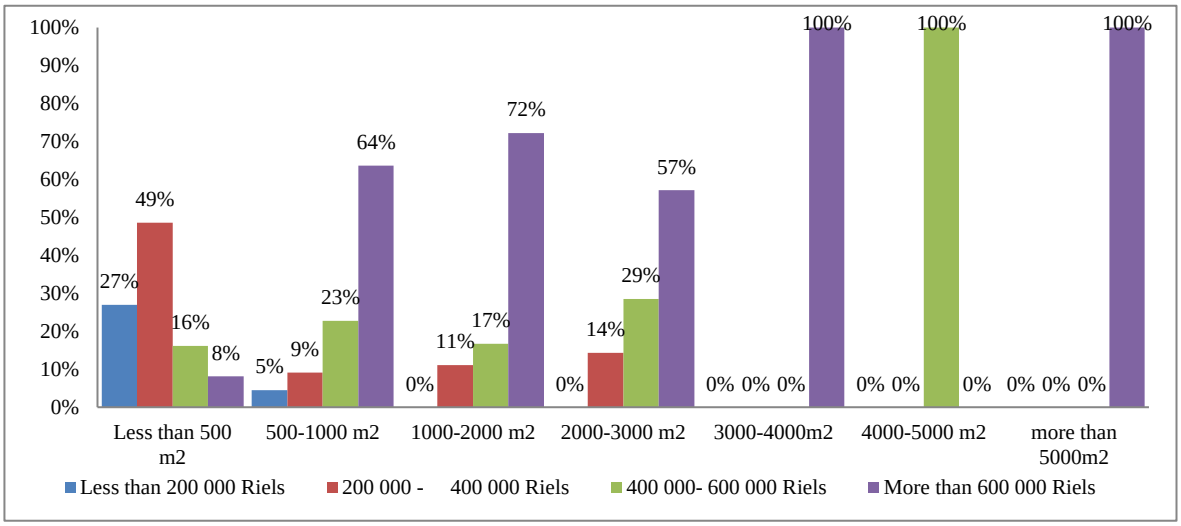

Figure 8. Profit against cultivated area

Comparing profits with the new technical applied: the study also wants to depict which technical practices that produce more profits for farmers on vegetable growing. Thus, we have cross-checked between the profits and technical practices of farmers which include full technical practices, partially technical practices (integrated between new technic and traditional technics) and traditional technics, the result shows that the integrated techniques (between techniques and traditional) provide highest profits for farmers, followed by full techniques practices in the second rank and traditional practice in the third ranked.

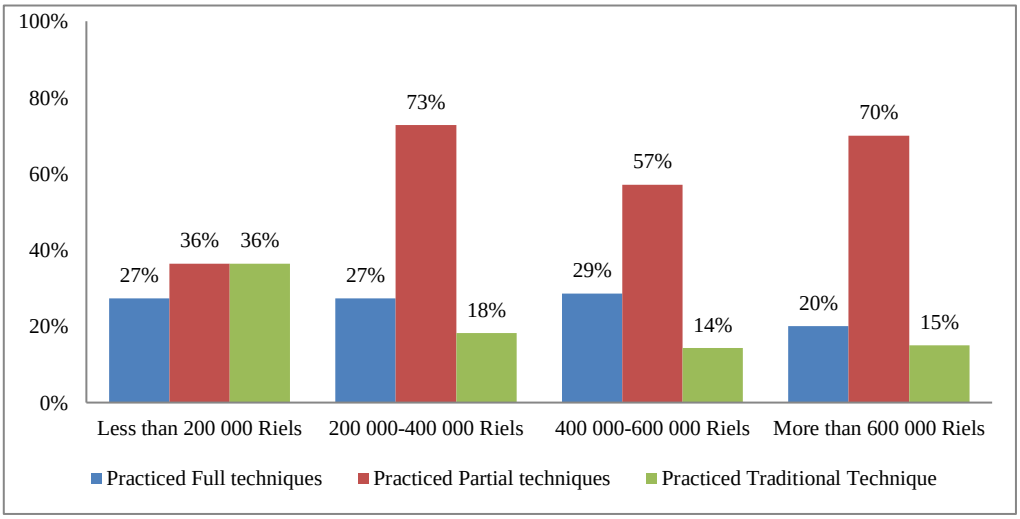

Figure 9. Profit against technical practices

3.3.3 Livelihood improvement

Finally, respondents have been asked to express on their family living standards by comparing before and after cultivating vegetables. As a result, all targeted farmers have mentioned that their families living standard are better than before (74% said that it's much better and 26% raised that it's better), while 98% of non-targeted farmers also mention that their family livelihoods are better than before (48% said that it's much better and 50% said it's better) and another 2% of them express that it is the same as before.

There are six purposes in income utilizations from vegetable selling. 100% of both targeted and non-targeted farmers use incomes to buy foods for their families, while about 85% use their incomes for household materials/equipment, 75% use for health cares, between 50%-55% use for business expansion and 9%-11% use for repayment of their loan.

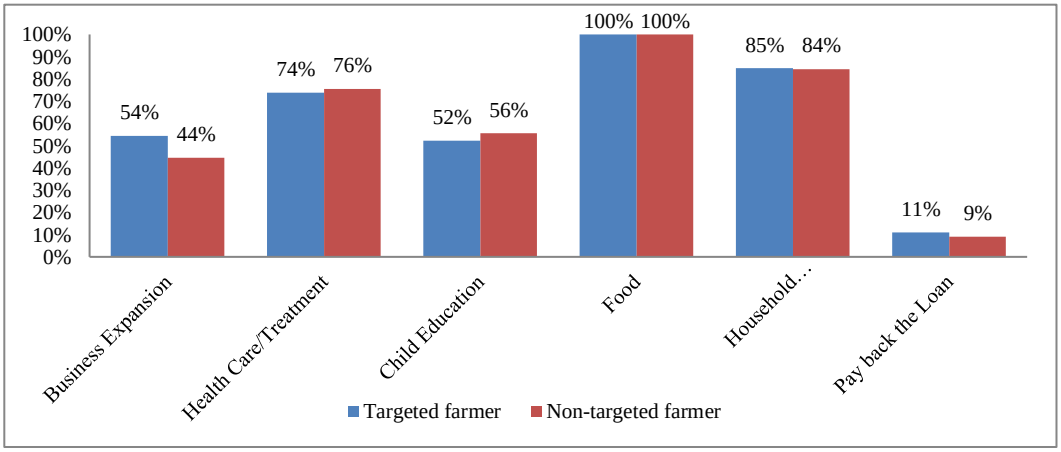

Figure 10. Percentage of Income Utilization

4. CONCLUSION

Through the findings from survey on vegetable cultivation in Svay Rieng and Svay Chrum districts, Svay Rieng province, we can conclude that the sharing of technical knowledge and experiences made by targeted farmers is more widely than non-targeted farmers in which may cause the targeted farmers receive more trainings both technical and spirit of sharing. The appropriate practice that brings higher profits for farmers in cultivating vegetable is mixing up between technics provided by training and experiences of the farmers. Even though all farmers used natural/organic fertilizers on their vegetable farms, the percentage of farmers used chemical fertilizers and pesticides remains high. Generally, non-targeted farmers spent higher than targeted farmers in their farming production in vegetable production, especially spending on chemical fertilizers, pesticides, and other farming materials. The higher expenditures contribute to non-targeted farmers gained lower profits than targeted farmers.

It is highly recommended that for future project, the research team should motivate the knowledge and experiences sharing among farmers more widely through conducting farmer exposure visits, field days, or farmer forums to allow all interested farmers (both targeted and non-targeted farmers) to learn from and sharing among each other. The project should define together with farmers the appropriate techniques and experiences based on the real geography situation, weather and climate change status, species of soil, and marketing in different target communities. Farmers in community should be encouraged in using natural/organic fertilizers as much as possible. In case they cannot to reduce or stop using chemical fertilizer and pesticides, the project should also focus on building knowledge of the farmers on how to use those chemical inputs more appropriately within technical advice and must avoid in using high poisonous chemical products that were banned by technical departments. It would be helpful if the project can support to link the targeted farmers (who received technical training) with other farmer groups or networks or corporative in the same or nearby targeted communities in order to strengthen and expand more profitable and advantages opportunities for farmers, particularly on market process for selling their products and easy accessibility to get loans with lower interest rates. Quality seeds and markets to sell their products are main factor to contribute to sustainability among farmers who grow vegetables and mushrooms. It is highly recommended that the project should build knowledge and capacity on how to select and keep quality seeds, and empower them to negotiate the prices for selling their products at the market. In addition, to link them to the technical persons or technical departments nearest in their communities for them to be able to reach out the quality seeds and other technical advices when they face problems.

5. ACKNOWLEDGE

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6. REFERENCES

Acharya, K. S., Chap, S., & Meach, Y. (2003). Off-farm and non-farm employment: A perspective on job creation in Cambodia (Working paper No. 26). Cambodia Development Resource Institute. Retrieved from https://cdri.org.kh/storage/pdf/wp26e_1617794728.pdf

Diepart, J. C. (2015). The fragmentation of land tenure systems in Cambodia: Peasants and the formalization of land rights (County Profile No. 6: Cambodia). Foncier et Développement. Retrieved from https://www.foncier-developpement.fr/wp-content/uploads/Country-profile-6_Cambodia_VF.pdf

Hamano, M., Matsumoto, T., & Ito, K. (2013). Technical modifications for the quality improvement of rice liquor (Sraa Sar) in Cambodia. Tropical Agriculture and Development, 57(4), 126-137. https://doi.org/10.11248/jsta.57.126

Itagaki, K. (2010). Production and distribution of vegetables in Cambodia [In Japanese].

Kawahara, S., & Yoshida, Y. (2006). Current status of vegetable production, distribution and trade in Cambodia [In Japanese]. Vegetable Information, 26, 43-55.

Olney, K. D., Talukder, A., Lannotti, L. L., Ruel, M. T., & Quinn, V. (2009). Assessing impact and impact pathways of a homestead food production program on household and child nutrition in Cambodia. Food and Nutrition Bulletin, 30(4), 355-369. https://doi.org/10.1177/156482650903000407

Royal Government of Cambodia (RGC). (2013). Census of agriculture in Cambodia 2013. Retrieved from http://www.fao.org/3/I9465EN/i9465en.pdf

Taylor, J. (2011). Food security, climate change and natural resources management in Cambodia: An overview of the literature and sourcebook. Learning Institute and IDRC.

World Bank. (2013). Where have all the poor gone? Cambodia poverty assessment 2013. Washington, D.C., USA. Retrieved from https://documents1.worldbank.org/curated/en/824341468017405577/pdf/ACS45450REVISE00English0260May02014.pdf

World Bank. (2015). Cambodian agriculture in transition: Opportunities and risks. Washington, D.C., USA. Retrieved from http://documents1.worldbank.org/curated/en/805091467993504209/pdf/96308-ESW-KH-White-cover-P145838-PUBLIC-Cambodian-Agriculture-in-Transition.pdf

World Bank. (2023). World Bank Open Data. Retrieved from URL https://data.worldbank.org/indicator/NY.GNP.PCAP.KD?end2021&locations=KH&start=1995&view=char