

## **SOCIO-CULTURAL AND ECONOMIC ASSESSMENT OF CTBS (COMMUNITY TRAP BARRIER SYSTEM) ADOPTION IN SOUTH VIETNAM**

**Florencia G. Palis<sup>1</sup>, Stephen Morin<sup>2</sup>, Ho Van Chien<sup>3</sup>, and Truong Ngoc Chi<sup>4</sup>**

<sup>1</sup>International Rice Research Institute, DAPO Box 7777, Metro Manila, Philippines

<sup>2</sup>USAID, Washington DC

<sup>3</sup>South Plant Protection Department, Tien Giang, South Vietnam

<sup>4</sup>Cuu Long Rice Research Institute, Cantho, South Vietnam

### **ABSTRACT**

*Assessment of CTBS (Community Trap Barrier System) adoption in South Vietnam shows that the adoption can be gleaned from the technical, economic, social and cultural angles. Farmers perceived that CTBS is an effective rodent control method. It reduced rat damage after CTBS implementation. The benefit due to CTBS adoption is the sum of the value of yield difference between TBS and non-TBS users, reduction on rodenticide costs including the cost of baiting and labor, and the value of rats caught from the traps in TBS. The profitability of CTBS assuming the cost is shared among the members within the halo. CTBS requires the community participation. However, the major constraints to farmer adoption of CTBS are high initial investment or expenditure and farmers acknowledge the difficulty in getting farmers share the costs. It is therefore suggested that government should subsidize farmers by providing them TBS materials to insure large-scale adoption of CTBS in South Vietnam.*

### **INTRODUCTION**

A farmers' choice of action adoption of a new technology is mainly influenced by his evaluation of the new technology. His evaluation is largely influenced by his perceptions on the effectiveness of the technology and the feasibility of the technology for farmer practice. This technological feasibility may include economic profitability, technological simplicity, social and cultural acceptability. A technology is likely to be adopted if the economic advantage is superior to the existing and other alternative technologies. Likewise, to insure that the technology be likely accepted by the target users the rice farmers it should be simple to implement and compatible with their culture such as their norms, beliefs, and practices.

This paper aims to explore factors for CTBS adoption and correspondingly, constraints to its adoption. This study is part of the collaborative project of CSIRO-AUSAID-IRRI and South Vietnam Department of Agriculture, particularly, South Plant Protection Department (SPPD), Institute of

Animal Sciences (IAS), and Cuu Long Rice Research Institute (CLRRI).

### **METHODS**

The study has two treatments: with CTBS and without CTBS. There were a total of 24 TBSs established. One TBS was established in each of the 6 hamlets in the districts of Cai Be and Cai Lay from the province of Tien Giang and districts of My Tu and Long Phu from the province of Soc Trang. Another two hamlets each from the said two provinces were chosen to serve as the control group. Key informant interviews, Focus Group Discussions (FGD), and a partial input-output survey on rice production using semi-structured questionnaires with personal interviews were conducted to elicit information on farmers' rodent pest management practices, farmers' perceptions on rodents as a constraint to rice production, profitability of CTBS, and to assess on the potential factors and constraints to farmer adoption of CTBS. A total of 233 farmer respondents were interviewed: 114 from the 12 treatment hamlets (six from each province), and 119 from the control hamlets.

The establishment of TBSs in the treatment sites was financed by the project. These include materials for TBSs like fence, rat traps, and seeds for the planting of trap crop, labor for pumping water because the trap crop will be planted early, and the labor for the establishment of CTBS. Farmers' equity was in the form of labor that is checking the rat traps daily and keeping record of the total rats caught. The maintenance and management of each CTBS were given to the members of each TBSs, those within the halo of effectiveness. Different dynamics and institutional arrangements in the CTBS management were noted. Basic statistical tests such as t-tests, frequency distribution, and graphical presentations were employed. Cases were also presented.

## RESULTS

### *Farmers' Perceptions on Technical Effectiveness of CTBS*

Adoption of CTBS among South Vietnam farmers can be gleaned from the following angles: technical, economic, social and cultural. In terms of technical acceptability, it should be perceived as an effective rodent control method. Table 1 shows farmer ranking on the effectiveness of different rodent control methods, as well as ranking on other attributes such as labor and cost requirements and others. Farmers perceived CTBS as the most effective control method, and that it requires low labor, and its use can be sustained in all three cropping seasons. However, the establishment of a TBS is perceived as most costly because it requires high initial investment in terms of the plastic fence, rat traps, labor, and land preparation.

Table 1: Farmers' rodent control methods and perceptions, Tien Giang, South Vietnam.

Control Methods	Effec- tiveness	Consume	Costs	Labor	Season			Community/ Individual
					1	2	3	
Trap	5	Y	M	H	Y	Y	Y	I
Rodenticide	6	N	H	H	Y	N	N	I
Catch by hand	6	Y	L	H	Y	Y	Y	C
Hunting by dog	3	Y	L	H	Y	Y	Y	C
Smoking the holes	8	Y	L	H	Y	Y	N	C
Sound of machinery, then digging	4	Y	M	H	Y	Y	N	C
Wood trap	2	Y	M	M	N	N	Y	C
Circling with grass	4	Y	L	H	N	N	Y	C
Sling Shot	7	Y	M	M	N	Y	Y	C
Long pole at night	3	Y	M	M	N	Y	Y	C
CTBS	1	Y	H	L	Y	Y	Y	C

(note: Y= yes; N = No; H= high; M= medium; L= low; C= community; I= Individual, season 1 = Winter –Spring, season 2 = Spring summer, season 3= Summer -Autumn)

Farmers further perceived CTBS as an effective rodent control method in terms of % rodent damage as shown in Table 2. Farmers observed a remarkable % damage reduction before and after CTBS implementation: from 12% to 4% in My Tu, and from 21.4% to 16.5% in Cai Be. In contrast to the control farmers, they perceived that rat damage has

increased or remained the same. CTBS farmers from the other two districts however perceived that damage due to rats remained the same. It is surmised that the technical effectiveness would be more apparent if TBS are established in known high rodent damaged areas.

Table 2. Perceived rodent damage (%) before and after CTBS, 2001 Summer-Autumn season

Village	With TBS*		Without TBS (control)	
	Before	After	Before	After
Tien Giang				
- Cai Be	21.44 <sup>a</sup>	16.55 <sup>b**</sup>	12.87 <sup>a</sup>	15.57 <sup>a</sup>
- Cai Lay	14.95 <sup>a</sup>	17.06 <sup>a</sup>	12.87 <sup>a</sup>	15.57 <sup>a</sup>
Soc Trang				
- My Tu	11.86 <sup>a</sup>	3.59 <sup>b***</sup>	11.79 <sup>a</sup>	7.56 <sup>a</sup>
- Long Phu	18.74 <sup>a</sup>	19.82 <sup>a</sup>	9.28 <sup>a</sup>	11.03 <sup>a</sup>

\*Means of the same letter in a row are not significantly different at the 0.05 level of significance.

\*\*Significant at 0.10 level of significance

\*\*\*Significant at 0.01 level of significance.

### ***Economic viability***

One measure of assessing the economic viability of TBS is through the marginal benefit cost ratio (MBCR). It is the ratio of additional benefit due to adopting TBS and additional costs due to adopting TBS. Table 3 shows that additional benefits due to TBS adoption is the sum of the value of yield difference between TBS and non-TBS users, reduction in rodenticide costs including the cost of baiting and labor, and the value of rats caught from the traps in TBS. Most of TBS farmers are no longer using rodenticides (70-97%) while most of control farmers are still using them (70-80%). The additional costs of adopting TBS is estimated to be at VND135,000 which largely include material costs and labor.

From the four villages, three had positive MBCR ranging from 2-6. This implies, that a farmer participating in a TBS would incur a minimum additional return of 2 and a maximum additional return of 6 VD for every one VD invested. There was one village which had a negative MBCR implying negative return. One of the reasons here is that some of the TBS participating farmers had planted late and were attacked by pests causing lower yield. Perhaps, synchrony was not properly followed yet in this village because the CTBS was just implemented in that season compared to the two villages in Tien Giang where CTBS had been

implemented for three years.

### ***Social and Cultural Practices***

Community action for rodent control is not new to Vietnamese farmers. Eighty percent of the existing rodent control methods are done as a group (Table 1). Only rodenticide use and small traps are done individually. Thus, CTBS, which calls for community participation is therefore viewed as likely feasible for widespread practice in controlling rodents. In Cai Be, the IPM club is well advanced. Checking the rat traps was done by schedules among the members of the club and those within the halo area of a TBS. In addition to, farmers prefer CTBS than rodenticides because the latter is hazardous to both animals and human health.

Rice field rats are both friends and enemies to South Vietnam farmers. Rats are considered enemies because they damaged their rice crops. They are also considered as friends because people in South Vietnam eat them. Rat meat is part of their food culture. Thousands of rats are being caught especially during the months of February, March and April (Khiem et al 2002). They have a particular delicacy for the rat meat. One can buy live rats at VND 6,000 per kg. One can also buy dressed rats in the public market in the amount ranging from VND 8,000-12,000 per kg.

Table 3: Marginal Benefit Cost Ratio of CTBS, South Vietnam.

Village	Yield (kg/ha)		Value of yield difference (VNdong)	Value of rats caught (VNdong)	Rodenti-cide, bait and labor (VNdong)	Additional Benefit (VNdong)	Additional Costs (VNdong)	Marginal Benefit Cost Ratio
	With TBS	Without TBS						
Tien Giang 2000 Winter-Spring								
CaiBe	6969	6882	120060	154500	18416	292976	135000	2
CaiLay	5589	5124	641700	147000	73532	862232	135000	6
Soc Trang 2001 Summer-Autumn								
MyTu	6120	5763	399840	222000	-6050	615790	135000	5
LongPhu	5432	5986	-620480	186000	44870	-389610	135000	-3

### ***Constraints to CTBS adoption***

Constraints to farmer adoption of CTBS are high initial investment and the sustainability of CTBS management. CTBS is expensive for one farmer to bear all the costs, on the average VND 135,000. Farmers acknowledge the difficulty in getting farmers share the costs. It is therefore suggested that government should subsidize farmers by providing TBS materials. In this case, farmers' equity would be the labor for establishing the TBS and the daily monitoring of the rat traps. In terms of managing the TBS, it requires daily checking of the rat traps. But since farmers normally visit their fields everyday, then checking of the rat traps would possibly be sustained. One way to mitigate this problem is to place the trap crop where the houses of the trap crop owner and members of the TBS are near to the trap crop (Morin et al. 2002). Another pathway is to place the trap crop where farm owners within the halo are relatives.

### ***Farmers suggestions for improving CTBS***

As of now, the TBS materials are replaced every season. So that they can still re-use them the following season, they suggested that the plastic should be thicker to insure durability. One way to reduce TBS investment is to reduce the height of plastic fence and use smaller traps compared to the present. Furthermore, they suggested that there will also be traps placed inside the trap crop, so that whenever some rats have in any chance entered inside the TBS fence, they will still be

trapped inside and the damage done in the trap crop be minimized or avoided.

### **CONCLUSION**

CTBS is likely to be adopted by South Vietnam farmers basing from four criteria: farmers' perceptions on the technical effectiveness of CTBS as a rodent control method, the profitability of CTBS assuming the cost is shared among the members within the halo, and considering their social and cultural practices. Major constraint to farmer adoption of CTBS is high initial investment or expenditure and farmers acknowledge the difficulty in getting farmers share the costs. It is therefore suggested that government should subsidize farmers by providing them TBS materials to insure large-scale adoption of CTBS in South Vietnam.

### **REFERENCES**

- Khiem NT, LQ Cuong, HV Chien. 2002. Report on the market study of field rat meat in the province of the Mekong Delta. Paper presented in the workshop on Rodent Management Using non-chemical in Mekong Delta, Aug 7-9, 2002. Tien Giang province, South Vietnam.
- Morin Stephen R, G Palis Florenca, HV Chien, TT Ngoc Chi, M Melina, and P Aida. 2002. Status of Anthropological work on CTBS. Paper presented at the HCMC CARD project. March 2002, Tien Giang Province, South Vietnam.

**Đánh giá các khía cạnh kinh tế xã hội đối với sự tiếp nhận bẫy chuột cộng đồng của nông dân ở miền Nam Việt Nam**

Đánh giá sự tiếp nhận bẫy chuột cộng đồng của nông dân ở miền Nam Việt Nam cho thấy sự tiếp nhận kỹ thuật mới này của nông dân dựa trên yếu tố kỹ thuật có thể chấp nhận được, kinh tế và xã hội. Về mặt kỹ thuật, nông dân nhận thấy rằng bẫy chuột cộng đồng là phương pháp phòng trừ chuột hiệu quả. Nó giảm thiệt hại do chuột gây ra. Lợi nhuận từ việc áp dụng bẫy chuột cộng đồng bao gồm năng suất lúa cao hơn, giá trị của chuột vào bẫy, giảm chi phí thuốc chuột, bẫy bã và công lao động đặt bã. Sự lợi ích của bẫy chuột cộng đồng về mặt chi phí là có sự chia sẻ của các nông dân trong vùng ảnh hưởng của bẫy. Bẫy chuột cộng đồng yêu cầu có sự tham gia của tập thể. Tuy nhiên, trở ngại quan trọng trong việc tiếp nhận kỹ thuật này là giá thành lập bẫy ban đầu cao mà không phải nông dân nào cũng có thể đóng góp được. Vì vậy chính quyền nên hỗ trợ nông dân bằng cách cung cấp vật liệu thành lập bẫy để bẫy chuột cộng đồng có thể được tiếp nhận rộng rãi.