

## **Development of Model for Efficient Reuse of Abandoned Sericultural Facilities in Korea**

**Kang Sun Ryu\*, Pil Don Kang, I Yeon Jung, Kee Young Kim, Kwang Gil Lee,  
Bong Hee Sohn and Yong Soon Kim**

*Department of Agricultural Biology, National Institute of Agricultural Science and Technology, RDA, Suwon 441 - 100, Korea*

*(Received 12 July 2008; Accepted 19 August 2008)*

Recently, there has been the gradual growth of the public in rural amenities, hobby farming works, much more urbanities, and especially near-retirees. However, in spite of popular preference to ruralities, little has been known about their demand on retired rural life. Therefore, this study examined urbanites' attitude to preparatory works for out-migration, preferred residential site condition and life styles in the countryside. For the purpose, data were collected from the survey with the sample of 62 urban trainees who were studying farming technology in department of training on agricultural technology of Korea National Agricultural College, RDA. We carried out the experience farming to candidate with using the abandoned sericultural facilities which are the silkworm rearing house and mulberry fields. The 71% of urban trainees, who answered in this survey, hoped to move into countryside after retirement and to make a monthly income of \$1,000 from agriculture. The age distribution of sericultural farmers is about 79% more than that of 60 years old. In the experience farming works. The two candidates made 1,977\$ with net income through 32 days worked in spring season. In autumn season, the couple candidates made 1,317\$ with net income through 23 days worked. Knowledge of these results will be important to policy-makers and to understand the role that retirement in-migration play in stimulating economic growth of rural agricultural farmers.

**Key words:** Sericulture, Silkworm, Retiree, Experience farming, Sericultural facilities

### **Introduction**

According to the South Korea's National Statistical office, the rate of senior population over 65 years old is increasing rapidly in farm village from 14.7% in 2000 to 18.6% in 2005. In 2006, 30.8% of the population in the villages was the people whose age was over 65. By contrary, the general population of farm villages has decreased continuously 25.9% in 1990, 20% in 2000 and 18.5% in 2005. This tendency raises a concern that South Korea could maintain its agriculture and farm villages after few years. In the meantime, as the result of average life increase, where to live and how to live after retirement become important factors to decide the quality of retired life.

In western countries like America and Canada, the migration of retired people in the cities to the farm villages has got attention from 1990's. Many studies show that the retired people bring many positive results with them like increase of local household profit, decline of unemployment rate, or creation of public service (Day & Barlett, 2000, Deller, 1995, Hodge, 1991, Reeder, 1998). With this viewpoint, Ryu K. S. (2003) who suggested importance of silver agriculture at first in the world, called silver agriculture the hobby of senior people after they retired. He also introduced the model of silver agriculture, which is producing high profitable products with little dependence on farmland and labors like mushrooms, bee-keeping, rearing of silkworm and insects, cultivation of plants, and herbs. Thus, agriculture part was selected one of the activation of old-friendly strategies that Presidential Committee on Ageing and Future Society built in 2004. They discussed supporting of old-friendly agriculture theme town and education of the people who return to the

---

\*To whom the correspondence addressed

Department of Agricultural Biology, National Institute of Agricultural Science and Technology, RDA, Suwon 441 - 100, Republic of Korea. Tel: +82-31-290-8518; E-mail: ryuks@rda.go.kr

**Table 1.** General characteristics of 62 trainees

Variable	Questionnaire and rate(%)							
Sex	Men		38(61.3)		Women		24(38.7)	
Birth place	Urban		33(53.2)		Rural		29(46.8)	
House type	Single		25(40.3)		Complex		37(59.7)	
Age	-49	14.5	50-59	58.1	60-69	25.8	70-79	1.6

1) The complex of house type is such as apartment.

**Table 2.** Hoping of the rental farming and rural moving

Variable	Questionnaire and rate(%)					
Rental farming	desire	27.4	after check	64.5	no concern	8.1
Repair facilities	government	58.1	loaner	30.6	renter	11.3

farm for core tasks of the agriculture part. However, the more urgent problem is a declination of farmers because of natural increase of aged farmers. Although agriculture management facilities increase, there are no enough successors to run the facilities.

Silver agriculture provides solutions of the current problems in farm villages and creates beneficial effects for them. It gives opportunities people who retire and return to the farm to learn farming skills and how to use agricultural facilities. Additionally, retired people still need to make profits annually, although they are small, after they retire. Finally, farm villages expect to solve the problem of lack of labor and enhance their economy by returning people.

## Materials and Methods

### Survey for the abandoned sericulture facilities lease

This is divided into three parts. The first, survey of the trainees who were studying farming technology in department of training on agricultural technology of Korea National Agricultural College, RDA was conducted in May 15, 2007. It surveyed 62 trainees, 38 males and 24 females, and asked about migration to the farm, prospective incomes, or difficulty of agriculture lives.

### Actual condition investigation of Sericulture households

This is conducted in major sericulture counties in South Korea, such as Seosan, Gongju, or Namone. Investigation parts are age distribution, labor, successor existence, or possible lease facilities.

### Field test of experience farming in sericulture farm

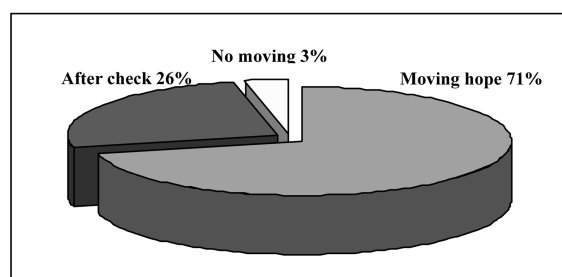
It was conducted in Asan city renting 1ha mulberry fields. The participants was collected from the web site of our department and returning campaign department. Two candidates reared five boxes of silkworm every certain season.

## Results and Discussions

### Survey for the abandoned sericulture facilities lease

This is conducted in May 15, 2007 and asked 62 students in education class with explanation of the survey motivation. General characters of the participants were male 61.3% and female 38.7%. The birth places were farm villages 46.8% and city 53.2% (Table 1). The survey of abandoned sericulture facilities management, unconditional desire was 27.4%, desire after check was 64.5%, and no interest was 8.1%. The survey for the subject to repair facilities was government 58.1%, loaner 30.6% and renter 11.3% (Table 2). This shows dependence on government is still high. According to the survey about the hope of rural moving, certainly move was 71%, after check was 26% and no moving was 3% (Fig. 1). Although the participants prepare their retired lives, the survey shows that they don't decide easily to move. The facts that people from the cities hope to move and desire more are true. However, there is no clear increasing or indication of retired moving, so the participants suspect they will move as they hope after they retire (Yoon. 2005). As Fig. 2 shows, \$1,000 is the highest, \$2,000 is 31%, \$1500 is 19% and, \$500 is 15% for the hope of monthly income among the answers of the participants.

Next chart is the investigation of rental charge, desiring income and difficulties of rural life. According to the

**Fig. 1.** The hope of rural moving.

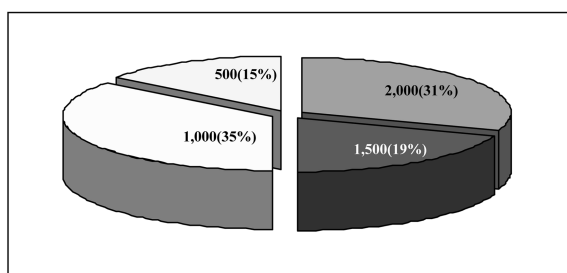


Fig. 2. The hope of monthly income (\$).

chart, \$100 through \$500 was adequate for managing 1ha mulberry fields, and the most anticipated difficulty of renting farming was a marketable problem. The second highest expected problem was the relationship with the

local neighborhood. The expected difficulties of living in farm villages were low income and hard labors, each 41.9% and 40.3% (Table 3). Also, Kang G. H. *et al.* (2007) indicated that the deficiency of agricultural skills and knowledge are considered as problems for many retired people. In addition, while men desire highly to move to farm villages, women hope less (Table 4-1, 2). Men expect marketable problems would be difficult for them, women suggest insects or civilized lives could be problems. Birth places were also related to the responds. People from rural places have more willingness to do rental farming and move after experience (Table 5). Lee K. S. (1997) studies indicate that the people who had childhood in rural cities or get no pensions after retirement have more possibility to choose rural cities for their

Table 3. The investigation of rental charge, desiring income and difficulties of rural life(money unit : \$)

Variable	Questionnaire and rate (%)							
	Rental of mulberry field	500	19.4	300	30.6	100	38.7	50
Worry about experience	harmony	30.6	funds	12.9	marketing	43.5	machines	12.9
Rural life	low income	41.9	works	40.3	insects	4.8	cultures	12.9

Table 4-1. The interaction analysis with sex (M: man, W: woman)

Variable	Questionnaire and rate(%)						
	Old age in rural	M	hoping	73.7	conditionally	23.7	no moving
	W		66.7		29.2		4.2
Hoping of rental farming	M	hoping	28.9	after check	65.8	no cern	5.3
	W		25.0		62.5		12.5
Rural moving after experience	M	moving	73.7	farming season	23.7	no moving	2.6
	W		62.5		33.3		4.2

1) There was no significant difference with sex.

Table 4-2. The interaction analysis with sex (M: man, W: woman)

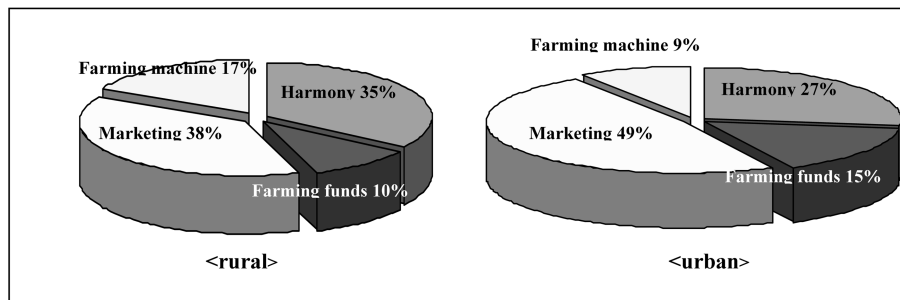
Variable	Questionnaire and rate(%)								
	Worry about experience	M	harmony	34.2	funds	7.9	marketing	50.0	machines
Worry about experience	W	harmony	25.0	funds	20.8	marketing	23.3	machines	20.8
Difficulties of rural life	M	low income	42.1	hard works	44.7	insects	2.6	cultures	10.5
Difficulties of rural life	W	low income	41.7	hard works	33.3	insects	8.3	cultures	16.7

1) There was no significant difference with sex.

Table 5. The interaction analysis with birth place (U: urban, R: rural)

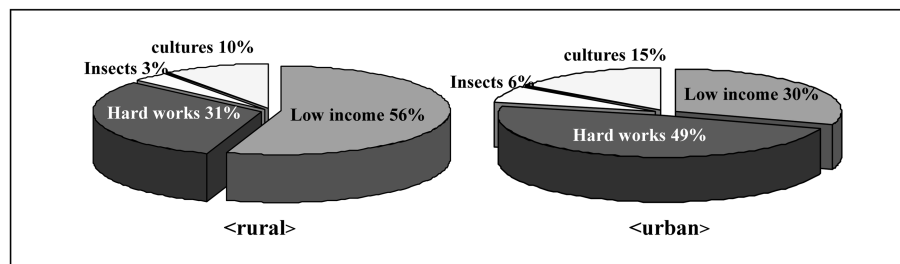
Variable	Questionnaire and rate (%)						
	Old age in rural	U	hoping	66.7	conditionally	30.3	no moving
Old age in rural	R	hoping	75.9	conditionally	20.7	no moving	3.4
Hoping of rental farming	U	hoping	21.2	after check	66.7	no cern	12.1
Hoping of rental farming	R	hoping	34.5	after check	62.1	no cern	3.4
Rural moving after experience	U	moving	63.6	farming season	33.3	no moving	3.0
Rural moving after experience	R	moving	75.9	farming season	20.7	no moving	3.4

1) There was no significant difference with birth place.



1) The rural and urban are birth places

**Fig. 3.** Worry about experience farming.



1) The rural and urban are birth places

**Fig. 4.** Expected difficulties in rural life.

homes in their future. The time of rural moving after experience and expected difficulties in the rural areas were also different depending on birth place. In Fig. 3, both of groups concern about marketable problems. They are considered as a big problem currently in rural areas. Fig. 4 suggests that low incomes are struggles for the people from rural cities, and experiences and hard works make people from the cities hesitate. However, Kim S. S. (2004) proposes that initial problem are purchase of land and animals (16.3%), transportation of farming money (30.5%), and initial invest money, funds to maintain farming (46.8%).

#### Actual condition investigation of sericulture farms

Actual condition investigation of sericulture farms were conducted in major 8 sericulture areas, such as, Seosan, Gongju, Chongup, Namwon, Hamyang, Youngchon, San-chong, Yechon. It mainly asked age distribution and availability of successors. After searching unused sericulture facilities, the investigation shows 79.5% of total farmers are over 60, so there are no human resources to maintain farms after 5 or 10 years. Few successors make the situation worse (Table 6). In the table 7, farmers are not willing to answer honestly about unused facilities, and neighbor area farmers usually use rent farming and there are 4 unused facilities in 4 areas. They expect unused facilities will increase more as the farmers are getting order.

#### Actual test of experience farming in sericulture farm

After choosing two candidates who desire rural moving, sericulture experience and actual test in Asan city, which is capable of renting sericulture facilities and mulberry fields. They inputted \$1,047 for farming expenditure and produced dry silkworm 25.7 kg (Table 9). Total farming work duration is 32 days and 15 days among these period worked with commute from downtown (Table 8). Total selling profits were \$1,977 was net income. The participants were coworkers in the bank as branch managers and finished experience without any problems. Two candidates selected the experience applicant which the couple is possible in autumn silkworm rearing season. As the table 10, Total farming work duration is 23 days and autumn season was shortened 9days than spring season. The husband has reared silkworm until 3rd instars with alone and received the help of wife from 4th instars. They inputted \$937 for farming expenditure and produced dry silkworm 41.0 kg more than 25.7 kg of spring season. The dry silkworm got the income of \$2,255 in order in the sericultural cooperative association to sell with wholesale. The net income was lower at the spring season which is with 1,317\$ (Table 11). The dry silkworm has been produced the end products in spring and directness sold got in the consumer and a high income. To the other side autumn season delivered the dry silkworm which is a materials product with wholesale and was made to get a low-end

**Table 6.** The Situation of sericultural farmers

Places	Age				%(60~)	labor power			Successor exist
	70~	60~69	50~59	~49		one	two	three~	Successor exist
Seosan(32)	12	11	8		71.8	9	22		1
Gongju(32)	10	12	6		68.8	1	31		2
Jungup(68)	27	19	21	1	67.8	18	50		1
Namwon(115)	71	32	10	2	90.4	-	-		1
Hamyang(13)	-	8	4	1	61.5	-	13		2
Youngchun(43)	18	11	10	4	67.4	1	42		7
Sanchung(70)	26	27	15	2	75.7	11	56	3	-
Yechun(325)	92	175	50	8	82.2	13	311	1	1

1) These places are major sericulture counties

**Table 7.** The Sericultural facilities of rentable for experience farming

Places	Farmer	Rearing house	Mulberry field
Seosan Daesan	Mr. Shin	2(3,000 m <sup>2</sup> )	90,000 m <sup>2</sup>
Seosan Jigog	Mr. Jang	1(1,500 m <sup>2</sup> )	30,000 m <sup>2</sup>
Yechun Yongmun	Mr. Lee	1(3,000 m <sup>2</sup> )	90,000 m <sup>2</sup>
Asan Songak	Mr. Lee	3(2,100 m <sup>2</sup> )	150,000 m <sup>2</sup>

1) These farmers were confirmed with visiting.

**Table 8.** The contents of experience farming in spring season

Contents	Before rearing	During rearing	After rearing
Days of working	12days (4.18~5.28)	17days (5.29~6.14)	3days (6.15~6.17)
Contents of working	Mulberry field management, Cleaning of rearing house	Rearing from 2nd instar to 5th instar 3th day	Dry of silkworm, Manufacturing of silkworm powder, Cleaning of house

1) The duration of before and after of silkworm rearing worked with commute from house to farm.

2) The duration for silkworm rearing worked with stay in farm.

**Table 9.** The simplicity analysis of income in spring season

Investment		Income	
Contents	Amounts	Contents	Amounts
○ Silkworm eggs (10boxes)	247	○ Produce of raw silkworm	190 kg
○ Farming tools	239	○ Dry silkworm	25.7 kg
○ Manufacturing of silkworm powder		○ Pills of silkworm for anti-diabetes	55 bottles/500 g
- Dry process			
- Freezing silkworm	561		
- Making Pills		○ Income	3,025
- Packing			
Sub total	1,047	Net income	:3,025 - 1,047 = 1,977 \$

1) Official assistances were supported repair cost of silkworm rearing house and fertilizer from research fund.

2) No involved the own labor.

income. This when general agricultural products directness does not sell in the consumer, the possibility of getting a many income is not the thing was given proof. Even though this test limits in sericulture relation farming in agriculture experience. If a sericulture and the other crops

cultivates together, the agriculture income will increase. Yoon (2006) reported preferred the vegetable culture, the wild flower potting plant cultivating, the traditional foodstuffs making in the farming village from after retire work. If like this the regular income is guaranteed, the

**Table 10.** The contents of experience farming in autumn season

Contents	Before rearing	During rearing	After rearing
Days of working	6 days (7.11 ~ 8.17)	16 days (8.30 ~ 9.14)	1 day (9.15)
Contents of working	Mulberry field management, Cleaning of rearing house	Rearing from 2nd instar to 5th instar 3th day	Dry of silkworm, Manufacturing of silkworm powder, Cleaning of house

1) The duration of before and after of silkworm rearing worked with commute from house to farm.

2) The duration for silkworm rearing worked with stay in farm

**Table 11.** The simplicity analysis of income in autumn season

Investment		Income	
Contents	Amounts	Contents	Amounts
○ Silkworm eggs (10 boxes)	247	○ Produce of raw silkworm	340 kg
○ Farming tools	104	○ Dry silkworm	41.0 kg
○ Manufacturing of silkworm powder		○ Semi-manufactured of silkworm for anti-diabetes	41.0 kg (55 KW/kg)
- Dry process	586		
- Freezing silkworm		○ Income	2,255
- Labor hire			
Sub total	937	Net income	:2,255 - 937 = 1,317 \$

1) Official assistances were supported repair cost of silkworm rearing house and fertilizer from research fund.

2) No involved the own labor.

actual condition of returning farm after retirement will become accomplished continuously. Park (2006) reported doing couple and family returning to the farm where is not independent returning to the farm. And Yoon (2006) suggested that the retiree immigration influx is an affirmative relation to this rural percentage of employment increase and county tax increase. there is an effect even to area economic activity. These results will be important to policy makers and to understand the role that retirement immigration play in stimulating economic growth of rural agricultural farmers.

## References

- Day, F. A. and J. M. Barlett (2000) Economic Impact of Retirement Migration on the Texas Hill Country. *Journal of Applied Gerontology* **19**(1), 78-94.
- Deller, S. C. (1995) Economic Impact of Retirement Migration, *Economic Development Quarterly* **9**(1), 25-38
- Hodge, G. (1991) The Economic Impact of Retirees on Smaller Communities; concepts and Findings from Three Canadian Studies. *Research on Aging* **13**(1), 39-54
- Reeder, R. J. (1998) Retiree-Attraction Policies for Rural Development, Food and Rural Economic division, Economic Research Service, U. S. Department of Agriculture. *Agriculture Information Bulletin* No. 741 : 1-22
- Kang, K. H., S. D. Yoon and J. K. Kang (2007) Classification of silver farming types and investigation of proper crop for silver farmers. *Journal of Agricultural Extension & Community Development* **14**(2), 301-328.
- Kim, S. S., J. W. Chenng, H. B. Lim, W. M. Koh, J. T. Kim and S. Lee (2004) Direction of Program Development for Supporting U-turn Farmers' Rural Settlement. *Journal of Agricultural Extension & Community Development* **11**(1), 53-65.
- Ryu, K. S. (2003) The Establishment of Model about Silver Agriculture. *Symposium of RDA*. 9-22
- Park, G. J., S. D. Yoon and K. H. Kang (2006) Factors Effecting on the Rural Life Satisfation of Returners to the farm After retirement. *Journal of Korean Society of Rural Planning* **12**(4), 63-76.
- Yoon, S. D., K. H. Kang, G. J. Park and J. H. Lee ( 2005) Determination of Migration Intention to Rural Area after retirement among Urban Residents in Korea. *Journal of the Korean gerontological Society* **25**(3), 139-153.
- Yoon, S. D. and G. J. Park (2006) A Demand Analysis on Urbanites Retired Life in the Countryside. *Journal of Korean Society of Rural Planning* **12**(2), 37-47.
- Yoon, S. D. and G. J. Park (2007) Relationship between Retirement Migration and Economic development of Rural Communities in Korea. *Korean J. Community Living Science* **18**(3), 455-467.
- Lee, K. S. (1997) Preferences of Urban Population on Rural Areas As Resort and Residence Places. *Journal of Korea Agricultural Economics* **38**(1), 35-46