

Appendix

Appendix 1 Retail prices of some agriculture products in study sites

-- VND/kg--

Item	Thai Nguyen			Phu Tho		
	1999	2000	2001	1999	2000	2001
Paddy rice	1810	2302	2150	2430	2027	1907
Glutinous rice	6807	6868	5700	5587	5270	4953
Cassava				929	914	945
Pork	19214	19930	19777	19583	20115	18740
Beef	35500	34791	34430	28916	28752	29986
Soybean	5413	5513	5222	5891	5409	5231
Processed tea						
Conv.	30466	34835	35111	24905	21164	21638
Org.	45000	48000	55000	35000	38000	40000

Source: Thai Nguyen Statistical Departments, 2001; and Phu Tho Statistical Departments, 2001.

Appendix 2 Comparison input and output means (per farm) between systems

	Unit	Difference mean ^a	t- computed ^b	Rejection of H ₀
Yield of fresh tea	<i>kg</i>	-84.2	1.75	at 0.10 level
Tea land size	<i>m²</i>	-281.7	1.68	at 0.10 level
Manure	<i>kg</i>	-346.4	1.22	ns
Labor	<i>man-day</i>	46.0	3.47	at 0.01 level
Age	<i>years</i>	-1.8	1.63	at 0.10 level
Edu	<i>school years</i>	2.0	4.9	at 0.01 level
Persons/family		-0.30	1.65	at 0.10 level
Labors/family		0.3	1.82	at 0.10 level
Training	<i>times</i>	3.22	10.94	at 0.01 level
TE index		0.06	2.12	at 0.05 level

Source: results from STATISTIX software, 2002.

Note: ^a mean values of output and inputs used in organic tea farm minus these respective value of conventional tea farms.

^b t calculated by STATISTIX software when two samples were compared.

Hypothesis: H₀: $\mu_1 = \mu_2$, H₁: $\mu_1 \neq \mu_2$

N₁= 56, N₂= 54. df = 56+54 -2, in which, N₁=number of conventional farms, N₂=number of organic farms.

t critical (108, .01) = 2.62

t critical (108, .05) = 1.98

t critical (108, .10) = 1.62

Appendix 3 Estimated TE of conventional and organic tea farm

	Conventional				Organic			
	No farm	TE-est	No farm	TE-est	No farm	TE-est	No farm	TE-est
1		0.71	29	0.96	1	0.97	29	0.86
2		0.56	30	0.96	2	0.83	30	0.98
3		0.63	31	0.67	3	0.86	31	0.95
4		0.58	32	0.96	4	0.98	32	0.99
5		0.97	33	0.88	5	0.81	33	0.83
6		0.78	34	0.80	6	0.80	34	0.51
7		0.48	35	0.96	7	0.85	35	0.71
8		0.69	36	0.79	8	0.99	36	0.80
9		0.41	37	0.88	9	0.92	37	0.86
10		0.59	38	0.80	10	0.81	38	0.88
11		0.85	39	0.75	11	0.85	39	0.83
12		0.70	40	0.93	12	0.84	40	0.99
13		0.58	41	0.92	13	0.92	41	0.92
14		0.71	42	0.98	14	0.98	42	0.98
15		0.67	43	0.91	15	0.96	43	0.83
16		0.96	44	0.87	16	0.99	44	0.47
17		0.73	45	0.92	17	0.77	45	0.69
18		0.43	46	0.82	18	0.76	46	0.79
19		0.96	47	0.92	19	0.99	47	0.87
20		0.97	48	0.70	20	0.99	48	0.85
21		0.63	49	0.73	21	0.88	49	0.84
22		0.80	50	0.74	22	0.81	50	0.98
23		0.69	51	0.92	23	0.81	51	0.95
24		0.57	52	0.88	24	0.50	52	0.98
25		0.80	53	0.73	25	0.70	53	0.85
26		0.76	54	0.94	26	0.80	54	0.49
27		0.93	55	0.86	27	0.86		
28		0.89	56	0.78	28	0.77		
Mean TE=		0.786			Mean TE=	0.846		

Appendix 4 Results of stochastic frontier and technical inefficiency model

for conventional tea farms.

Output from the program FRONTIER (Version 4.1c)

instruction file = contea1.ins

data file = contea1.dta

Tech. Eff. Effects Frontier (see B&C 1993)

The model is a production function

The dependent variable is logged

the ols estimates are :

	coefficient	standard-error	t-ratio
beta 0	0.42543042E+00	0.55404573E+00	0.76786157E+00
beta 1	0.29305773E+00	0.60045500E-01	0.48805943E+01
beta 2	0.22931815E+00	0.48523186E-01	0.47259499E+01
beta 3	0.32593447E-01	0.27252840E-01	0.11959652E+01
beta 4	-0.64980152E-01	0.37755290E-01	-0.17210873E+01
beta 5	0.13117414E+00	0.98784008E-01	0.13278884E+01
beta 6	-0.36290015E-03	0.11983499E-01	-0.30283322E-01
beta 7	0.51392344E+00	0.79410478E-01	0.64717334E+01
beta 8	-0.13345489E-01	0.64743637E-01	-0.20612819E+00
sigma squared	0.43771466E-01		

log likelihood function = 0.13050806E+02

the estimates after the grid search were :

beta 0	0.60175138E+00
beta 1	0.29305773E+00
beta 2	0.22931815E+00
beta 3	0.32593447E-01
beta 4	-0.64980152E-01
beta 5	0.13117414E+00
beta 6	-0.36290015E-03
beta 7	0.51392344E+00
beta 8	-0.13345489E-01
delta 0	0.00000000E+00
delta 1	0.00000000E+00
delta 2	0.00000000E+00
delta 3	0.00000000E+00
delta 4	0.00000000E+00
delta 5	0.00000000E+00
delta 6	0.00000000E+00
sigma squared	0.67825845E-01
gamma	0.72000000E+00

(cont'd)

the final mle estimates are :

	coefficient	standard-error	t-ratio
beta 0	0.15396559E+01	0.37297836E+00	0.41280032E+01
beta 1	0.11014232E+00	0.37655892E -01	0.29249692E+01
beta 2	0.25815131E+00	0.32386696E -01	0.79709061E+01
beta 3	0.85946377E-01	0.18788788E -01	0.45743439E+01
beta 4	-0.93723177E-01	0.27439807E -01	-0.34155917E+01
beta 5	0.11156182E+00	0.58339223E -01	0.19122952E+01
beta 6	0.89920018E-02	0.63024267E -02	0.14267523E+01
beta 7	0.59029143E+00	0.43569719E -01	0.13548204E+02
beta 8	-0.13748561E-01	0.45184636E -01	-0.30427512E+00
delta 0	0.15329519E+01	0.25164358E+00	0.60917585E+01
delta 1	-0.18151641E-01	0.51949679E -02	-0.34940814E+01
delta 2	-0.43089505E-01	0.20395012E -01	-0.21127472E+01
delta 3	-0.22239276E-01	0.20450861E -01	-0.10874494E+01
delta 4	-0.16759781E+00	0.66176405E -01	-0.25325917E+01
delta 5	-0.20626161E+00	0.99408006E -01	-0.20748994E+01
delta 6	-0.92529044E-01	0.73202132E -01	-0.12640212E+01
sigma squared	0.22720679E -01	0.70285988E -02	0.32326043E+01
gamma	0.85713529E+00	0.16967481E+00	0.50516353E+01

log likelihood function = 0.39469366E+02

LR test of the one-sided error = 0.52837121E+02

with number of restrictions = 8

[note that this statistic has a mixed chi-square distribution]

number of iterations = 41

(maximum number of iterations set at : 100)

number of cross-sections = 56

number of time periods = 1

total number of observations = 56

thus there are: 0 obsns not in the panel

Appendix 5 Results of stochastic frontier and technical inefficiency model
for organic tea farms.

Output from the program FRONTIER (Version 4.1c)

instruction file = orgtea1.ins
data file = org1.dta

Tech. Eff. Effects Frontier (see B&C 1993)
The model is a production function
The dependent variable is logged

the ols estimates are :

	coefficient	standard-error	t-ratio
beta 0	-0.86801353E+01	0.98067183E+00	-0.88512131E+01
beta 1	0.17456632E+01	0.23912944E+00	0.73000764E+01
beta 2	0.68413733E-01	0.86316091E-01	0.79259536E+00
beta 3	-0.47416509E-02	0.42761803E-01	-0.11088520E+00
beta 4	0.26133574E+00	0.99913263E-01	0.26156261E+01
beta 5	0.88021348E-01	0.11143961E+00	0.78985694E+00
beta 6	0.20285478E-01	0.65289242E-01	0.31070169E+00
sigma squared	0.36505469E-01		

log likelihood function = 0.16503821E+02

the estimates after the grid search were :

beta 0	-0.84865670E+01
beta 1	0.17456632E+01
beta 2	0.68413733E-01
beta 3	-0.47416509E-02
beta 4	0.26133574E+00
beta 5	0.88021348E-01
beta 6	0.20285478E-01
delta 0	0.00000000E+00
delta 1	0.00000000E+00
delta 2	0.00000000E+00
delta 3	0.00000000E+00
delta 4	0.00000000E+00
delta 5	0.00000000E+00
delta 6	0.00000000E+00
sigma squared	0.69241962E-01
gamma	0.85000000E+00

(cont'd)

the final mle estimates are :

	coefficient	standard-error	t-ratio
beta 0	-0.77723348E+01	0.34034013E+00	-0.22836963E+02
beta 1	0.16596730E+01	0.44878554E -01	0.36981429E+02
beta 2	0.67198748E-01	0.24187875E -01	0.27781997E+01
beta 3	0.28642649E-02	0.67945298E -02	0.42155455E+00
beta 4	0.22949671E+00	0.49182740E -01	0.46662042E+01
beta 5	0.96036491E-01	0.52123310E -01	0.18424864E+01
beta 6	0.23868174E-01	0.22653757E -01	0.10536078E+01
delta 0	0.15902805E+01	0.15491016E+00	0.10265824E+02
delta 1	-0.93943226E-02	0.37735681E -02	-0.24895066E+01
delta 2	-0.65869709E-01	0.24264275E -01	-0.27146787E+01
delta 3	-0.87262512E-01	0.25570426E -01	-0.34126343E+01
delta 4	0.22837424E-01	0.12999538E+00	0.17567873E+00
delta 5	-0.26147607E+00	0.15548031E+00	-0.16817311E+01
delta 6	-0.22874455E-01	0.98135018E -01	-0.23309167E+00
sigma.squared	0.20221106E -01	0.66065695E -02	0.30607573E+01
gamma	0.95269451E+00	0.75655939E -02	0.12592462E+03

log likelihood function = 0.57681852E+02

LR test of the one-sided error = 0.82356062E+02

with number of restrictions = 8

[note that this statistic has a mixed chi-square distribution]

number of iterations = 67

(maximum number of iterations set at : 100)

number of cross-sections = 54

number of time periods = 1

total number of observations = 54

thus there are: 0 obsns not in the panel

Appendix 6 Photos of systems in selected study sites.

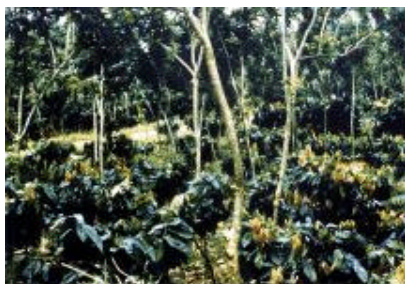


Photo 1 Shading tree



Photo 2 Tea processing in family



Photo 3 Tea plucking



Photo 4 Visit tea grower



Photo 5 Tea manufacture



Photo 6 Tea transport



Photo 7 Tea plucking



Photo 8 Tea packaging, storing



Photo 9 Tea packaging



Photo 10 Tea products



Photo 11 Tea fields (a) in Phu Tho



(b) in Thai Nguyen

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright © by Chiang Mai University
All rights reserved

Curriculum Vitae

Name: Mr. Nguyen Chi Trung

Birth date: October 17, 1969

Place of birth: Ha Tay province, Vietnam

Education background:

1986 - 1990 B.A. Economics
National Economic University, Hanoi, Vietnam

2001 - 2003 M.S. (Agriculture) in Agricultural Systems
Faculty of Agriculture
Chiang Mai University, Chiang Mai, Thailand

Scholarship:

2001 – 2003 The Ford Foundation

Working experience:

1990 - to date Agricultural Researcher, National Institute of Agricultural
Planning and Projection (NIAPP), Hang Chuoi, Hanoi, Vietnam

Office address:

National Institute of Agricultural Planning and Projection
(NIAPP), 61 Hang Chuoi, Hanoi, Vietnam

Tel. 84 - 4 – 8214921

Fax. 84 - 4 – 8214163

Home tel. 84 - 4 - 5760674

e-mail Ngtruang@yahoo.com