

2. FARM SYSTEM MANAGEMENT

2-1. Increase sales amount of farm production

a) Increase yield (Y)

By better variety, more fertilizer or better weather etc.

b) Higher crop price (pc)

By higher market price or price control of government etc.

c) Increase farm scale (A)

d) Financial support for farm

Example: FM-R-Phil-Simulation.xls [Simulation]

		Total profit	
		PR: \$	%
Original		288	0.0
2-1-a	Yield(Y) 10% up	363	26.0
2-1-b	Crop price(pc) 10% up	363	26.0
2-1-c	Farm scale (A) 10% up	331	14.9
2-1-d	Subsidy 10% for machinery purchase	303	5.2

2-2. Saving of machinery cost

Find lower cost of the work

2-2-1. Decrease fixed cost

a) Save machinery purchase price

(1) Develop local machine

(2) Introduce used machine

b) Decrease share

c) Check depreciation, taxes, insurance, interest etc.

d) Introduce subsidy

2-2-2. Decrease variable cost

- a) Increase effective field capacity (EFC)
 - (1) Better skill of operator
 - (2) Field size, shape or farm road
- b) Save fuel cost
- c) Save labor cost
- d) Save material cost
- e) Save repair cost

2-3. Replace the farm work**2-3-1. Select a work**

- a) High Annual cost per ha (TCa)
- b) Work by hand, if labor shortage
- c) Coverage of work (CA_W) is over or limited capacity.
- d) Government policy

Use Cost of rotary tillage: cost-tillage.xls:[tillage cost]

Cost of transplanting: cost-transplant.xls:[transplant cost]

Cost of weeding: cost-weeding.xls:[weeding cost]

Cost of spraying: cost-spray.xls:[spray cost]

Cost of harvest: cost-harvest.xls:[harvest cost]

List up a present work, walking type or riding type machinery.

2-3-2. Compare custom charge (contract fee) [CC] with work cost per ha [TCa_W] at the farm scale.

- a) If $CC < TCa_W$, then ask the work to contractor.
- b) If a work cost per ha is less than other, introduce it to the system.
Attention please on Coverage (CA).

Example: FM-R-Phil-Simulation.xls [Simulation]

Example 2-3-1	Total profit	
	PR: \$	%
Original	288	0.0
a) High Annual cost per ha: tillage: Sp=20%	323	12.2
b) Work by hand: harvest by binder	247	-14.2
ditto A = 1.2ha	338	17.4
c) CA_W is over or limited capacity: weeding		-100.0
d) Government policy: transplanting	248	-13.9
ditto A = 1.2ha	341	18.4

2-4. Discuss total farm work system

2-4-1. Farm scale

Make farm scale large by rental etc.

2-4-2. Co-operative system

- a) Farm association: JA[Japan agriculture cooperative association]
- b) Group ownership of machinery
- c) Group utilization organization: Maschinen Ring:[KIKAI-GINKO]

2-4-3. Regional utilization system

- a) Contract work (by government or private system)
- b) Moving in wider area: [Maika](#) [harvest contractor in China]

2-4-4. Improve cultivation system

- a) Make working hour per year longer
- b) Introduce multi-crop system
- c) Select varieties for longer working period
- d) Improve cultivation method: [rice transplanting to direct seeding]
- e) Improve cultivation style: [crop row distance or hill interval]

2-4-5. Develop and introduce new machinery or technology

- a) Introduce new idea machinery, [precise farming] or [management software]
- b) Develop appropriate machine
- c) Machinery utilization & maintenance system: [workshop etc.]
- d) Introduce used machinery
- e) Financial support, extension work or education
 - (i) Subsidy or low capital interest for investment to machinery
 - (ii) Financial and political support for machinery utilization
 - (iii) General primary education
 - (iv) Extension work
 - (v) Pilot farm

2-5. Investment to machinery

Example: See fm-541.xls : Ex-9 and Simu-E3.xls
Recovery period (Pay-back period)

2-6. Machine renewal (or replacement)

2-6-1. Replacement by average unit accumulated costs

See ASAE-EP496 and fm-542.xls

2-6-2. Annual payment of worth

See fm-542.xls

2-6-3. By decision making method

AHP (Analytic Hierarchy Process)

2-7. Exercise for system analysis

Exercise 5-1. : List up data of your conventional farm system.

- a) Examine the following items, at [Conventional-farm-template.xls]
 - 1. Prerequisite condition
 - 2. Pre-data for system analysis
 - 3. Machinery list
 - 4. Farm Work list
 - 5. Rate of work
 - 6. Material list

- b) Input above data at [FM-System-template.xls],

Exercise 5-2. : Try Simulation on your conventional farm system
(Partial budgeting).
Use the above [FM-System-template.xls]

Exercise 5-3. : Improvement by replacing machinery
Example: Introduce the tillage of
1) Walking type tractor, 2) Riding type tractor

Exercise 5-4. :Simulation
a) Increase farm scale
Example: 1) by land rent, 2) by cooperative or association system
b) Subsidy or financial support

Exercise 5-5. : Try Investment or Budgeting Plan.

- a) Seek optimal investment by simulation

Exercise 5-6. : Show Action Plan as recommendable farm mechanization.