CHAPTER VI

POLICY ANALYSIS

The ultimate purposes of such studies has been to identify cost-effective policy instruments for raising crop yields and income of the farm families which is also a central objective of the Thai agricultural policy. The impact of any policy instruments would have to work through the actions of the farmers and the agronomic characteristics of the crops. Therefore, in order to predict the impact of alternative policy instruments we need to know the quantitative response of farmers to economic incentives introduced by these instruments as well as the response of the crops to changes in input use consequent of the farmers' response to policy instruments (Puapanichya and Panayotou, 1985).

Fifteen policy alternatives are considered: four single instrument policies (fertilizer price, labor price, tractor power price and rice price); six two-instrument combinations; four three-instruments combinations; and, one four-instrument combination. For analysis, we consider the effect of a 10 percent reduction in input prices (i.e., fertilizer, labor subsidies and machinery subsidies) and a 10 percent increase in rice prices (output subsidy) both individually and in combination.

The procedure used to calculate the cost-effectiveness of the policy alternatives were utilized from Puapanichya and Panyotou (1985) : First, based on

the elasticity estimates the percentage change in input use and crop production as a result of these subsidies were calculated (Table 29). Second, using these percentages and the estimated input and production data of the sample (Table 30), the absolute change in input use and crop production were calculated on a *per rai basis* (as a representative for Chiang Mai province as a whole) which were then converted to costs and value, respectively, using the corresponding post-subsidy prices.

Table 29. Effects of selected policies on wet season rice production in Chiang Mai province

Policy	Farmers' response (% effect on input and output)			
	Use of Fertilizer	Use of Labor	Use of Tractor	Rice Output
1. 10 % ↓ in fert. price	8.056	0.154	0.348	0.146
2. 10 % ↓ in wage rate	0.568	6.856	1.723	1.160
3. 10 % ↓ in trac. price	0.860	0.783	3.651	0.678
4. 10 % ↑ in rice price	2.827	4.157	5.008	3.128
5. (1) + (2)	8.624	7.010	2.071	1.306
6. (1) + (3)	8.916	0.937	3.999	0.824
7. (1) + (4)	10.883	4.311	5.356	3.274
8. (2) + (3)	1.428	7.639	5.374	1.838
9. (2) + (4)	3.395	11.013	6.731	4.288
10. (3) + (4)	3.687	4.940	8.659	3.806
11. (1) + (2) + (3)	9.484	7.793	5.722	1.984
12. (1) + (2) + (4)	11.451	11.167	7.079	4.434
13. (1) + (3) + (4)	11.743	5.094	9.007	3.952
14. (2) + (3) + (4)	4.255	11.796	10.382	4.966
15. (1) + (2) + (3) + (4)	12.311	11.950	10.730	5.112

Source: Computed

Table 30. Base-line data used for calculating costs and benefits of alternative inputs and output price policies

Fertilizer quantity (kg/rai)	16.79
Fertilizer price (baht/kg)	5.47
Labor amount (man-day/rai)	6.18
Wage rate (baht/man-day)	72.27
Tractor quantity (unit/rai)	1.00
Tractor rate (baht/rai)	214.38
Rice production (kg/rai)	602.12
Rice price (baht/kg)	3.78

Note: Estimated at the sample means for wet season rice production (varietal differences incorporated).
Source: Computed

The difference between the change in value and the change in costs is the benefit to the farmers from the subsidy-induced increase of production. To arrive at the total net benefit to the farmers from the subsidy, we have to add the savings in input cost and increase in output value from the pre-subsidy level of production (Puapanichya and Panayotou, 1985). The results of these steps are reported in Table A6 in the Appendix. Next step is to calculate the cost of subsidy to the government which equals the unit output subsidy multiplied by the post subsidy output plus the unit subsidy multiplied by the post subsidy input use. Finally, the difference between the total benefit to the farmers and the cost to the government gives the net social benefit of the subsidy (see Table A6). The various policy alternatives are ranked according to the ratio of their net social benefit to their cost on a per rai basis.

Table 31 summarize the results of these calculations. For rice production in Chiang Mai province, the most cost-effective policy appears to be a reduction in tractor power prices. A 22 baht subsidy per rai will give a net benefit of 26 baht per rai to farmer and 4 baht per rai to the country. This amounts to 18.7 percent return on the tractor power subsidy. An output price subsidy of 235 baht per rai, on the other hand, will give a substantially higher net benefit of 274 baht per rai to farmer and 39 baht per rai to the country. The rate of return being 16.7 percent (ranked two). For the combination policies, most cost-effective appears to be a combination of tractor power price and rice price subsidy. A total subsidy of 258 baht per rai would yield a net benefit of 300 baht per rai to farmer and 42 baht per rai to the country. The rate of return being 16.2 percent (ranked three).

It should be noted that, policy-makers do not choose policies based on only a single criterion of cost-effectiveness but also have distribution considerations. The latter criterion often complicates the policy prescriptions. If the government's distributional objectives is targetted to raise the income of the rice farmers, the output price subsidy policy or a combination of both rice price and tractor power price subsidy would yield substantially higher income to farmers. However, the cost-effectiveness of these two policy instruments are about 2 to 2.5 percent lower than the most cost-effective policy, the single tractor power price subsidy, which would generate very low income for the farmers in absolute terms.

Table 31. Cost-effectiveness of alternative policies for rice production

Policy Alternatives	Net benefit to farmers (baht/rai)	Government susidy (baht/rai)	Net impact of policy (baht/rai)	Cost effect-iveness (%)
1. 10% ↓ in fert. price	4.41	9.92	-5.51	-55.52
2. 10% ↓ in labor price	39.30	44.76	- 5.46	-12.20
3. 10% ↓ in trac. price	25.52	21.51	+4.02	+18.70
4. 10% ↑ in rice price	274.00	234.72	+39.28	+16.74
5. (1) + (2)	43.72	54.68	-10.97	-20.06
6. (1) + (3)	29.95	31.44	-1.49	-4.73
7. (1) + (4)	278.42	244.98	+33.44	+13.65
8. (2) + (3)	64.84	66.27	- 1.44	-2.17
9. (2) + (4)	313.30	282.12	+31.18	+11.05
10. (3) + (4)	299.54	257.78	+41.76	+16.20
11. (1) + (2) + (3)	69.25	76.20	-6.95	-9.12
12. (1) + (2) + (4)	317.72	292.38	+25.34	+8.67
13. (1) + (3) + (4)	303.95	268.03	+35.92	+13.40
14. (2) + (3) + (4)	338.84	305.18	+33.66	+11.03
15. (1) + (2) + (3) + (4)	343.25	315.43	+27.82	+ 8.82

Source: Computed

As providing a complete set of policies is beyond the scope of this study, it seems that price policies for raising rice yields and farm incomes in Chiang Mai province should focus on rice prices and tractor power prices. Reducing the cost of tractor in the Chiang Mai province may take two forms. In addition to reducing the rental cost of tractors, the actual cost of tractors could be reduced by encouraging assembling facilities and cutting tax on material imports, sales tax, providing cheap after sales services etc. As tractors and labor are complementary inputs, the reduction in the rental cost of tractors would also generate employment.