CHAPTER VI

POLICY ANALYSIS MATRIX FOR RICE PRODUCTION IN BHUTAN

The focus of this chapter is to assess the impact of present government policies on rice production in the country. To arrive into the assessment of the policies, this chapter first gives a brief discussion on the data assumptions used in computing the social prices for the output and the inputs. It then goes on to the computation of the social prices and finally the PAM analysis leading to discussions based on the results of the PAM. Bhutan imports almost 50 percent of its rice requirements, as rice production in the country is mostly subsistence oriented. The analysis that follows in this chapter is therefore based on the import parity price of outputs and tradable inputs. Import parity price is a price charged for a domestically produced good that is set equal to the domestic price of an equivalent imported good, that is the world price plus transport, handling, and commission. The results from the analysis are compared to the import price and do not compare the rice production in Bhutan with the rest of the world.

6.1 Data assumptions for social prices

The most difficult part in constructing a PAM is the estimation of social prices and the decomposition of inputs into their tradable and their non-tradable components. The social prices of tradable outputs and inputs are the border prices of commodities adjusted for transportation, marketing and processing cost to bring such commodities down (either buy or sell) to the operator level (Ekasingh, et.al., 1999). Border price can be defined as the price at which suppliers from the exporting country would deliver the goods to the domestic market or the price that consumers in the importing country would be willing to pay domestic suppliers to deliver the goods into their markets. When the goods are imported, the prices are called as social import parity price and if the goods are exported then the prices are called social export parity price.

6.1.1 Output social price

To calculate social price of rice the average free on board (f.o.b.) Bangkok price of January to November 2004, for 15 percent broken rice was used, as Thailand is the largest exporter of rice in the world and world prices are more or less dictated by Thai prices. Discussions were held with the Metro Shipping Company in Bangkok on the freight and insurance cost. According to this freight forwarder, the freight and insurance cost for a 40 cubic feet container with 23 tons of rice is US$3300. The insurance is till the border town of Phuentsholing. However, an inland transportation cost of Nu.50,000 would also have to be paid per container for transporting it from the Indian port of Kolkata to Phuenstholing in Bhutan.

The equilibrium exchange instead of the real exchange rate has been used in this study for the import parity price of output. The equilibrium exchange rate was calculated based on exchange rate premium. The exchange rate premium on the other hand was calculated based on the differences between the official exchange rate of the Central Bank (Royal Monetary Authority) and the unofficial exchange rate prevalent in the market. The difference between the official and the unofficial rate has been assumed to be three percent.

Once the consignment reaches Phuenstholing it is handled by the Food Corporation of Bhutan (FCB) as it is responsible for the procurement and distribution of essential food items in the country. They levy 10 per cent on the value as handling and storage charges. The FCB transports officially imported rice to different parts of the country. The transportation rate fixed by FCB for the year 2004 has been used for the analysis. This transportation rate is a competitive rate as it is arrived at through tenders and often offered to the lowest bidder. The rate of transporting goods from Phuenstsholing to all hill stations was Nu.3.62 per Km/ton while to all plain stations it was Nu.2.20/Km/ton in the year 2004. The average costs of transporting a ton of rice to the three different study locations in 2004 are as shown in Table 6.1.

Table 6.1. Average transport cost by location

Location	Average Distance from dry port	Cost	Total Cost
	-----Km-----	---Nu/Km/t---	---Nu/t---
Samtse	130	2.20	286.00
Lobesa	233	3.62	843.50
Paro	175	3.62	633.50

The government shoulders the cost of transporting imported rice throughout the country so that imported rice is affordable even by the poorer sections of the society. Rice imported through FCB is sold to consumers through the Fair Price Shops and these shops sell with a five per cent margin. Table 6.2 shows the import parity price of rice for the different study locations.

Table 6.2. Import parity price of rice by locations

	Samtse	Lobesa	Paro
F.o.b Bangkok ($/Ton)	238	238	238
Freight and insurance cost ($/ton)	132	132	132
C.i.f. price at Bhutanese port ($/Ton)	370	370	370
Exchange rate (Nu/$)	44.5	44.5	44.5
Exchange rate premium (%)	3%	3%	3%
Equilibrium exchange rate (Nu/Rs)	45.8	45.8	45.8
C.i.f. in domestic currency (Nu/Ton)	16959	16959	16959
Weight conversion factor (Kg/ton)	1000	1000	1000
c.i.f. in domestic currency and weight units (Nu/Kg)	16.96	16.96	16.96
Transportation cost from Kolkata to P/Ling (Nu/Kg)	2	2	2
In land transportation cost (Nu/Kg)	0.3	0.8	0.6
Handling cost (Nu/Kg)	1.70	1.70	1.70
Value before processing (Nu/kg)	20.9	21.5	21.3
Import parity value at wholesale (Nu/kg)	20.9	21.5	21.3
Profit margin of Fair Price Shops (Nu/kg)	1.05	1.07	1.06
Import parity value at FCB outlets (Nu/Kg)	22.00	22.52	22.32

Price source: USDA, 2005
Average price of 2004/2005

6.1.2 Social prices of inputs

Given the geographical setting of Bhutan border prices can be interpreted in two ways, especially for the import substituting goods. In accordance to the theory a world parity price can be arrived at by deriving such a price from the main international supply point for that commodity and then adjusting it for the quality and transport and handling charges right up to the relevant market. The real border price, however, faced by the Bhutanese farmers, is the price of the Indian good at the border. This price is real and of relevance and works out to be much lower than the theoretical border price. However, the relevant Indian border prices for the inputs only have been selected as the more appropriate border price in this study.

The transportation cost used by Druk Seed Corporation (DSC) for the transportation of inorganic fertilizers and weedicide has been assumed to be the same as that of the Food Corporation of Bhutan. The 10 percent commission offered to the commission agents by the government on the value of the goods sold has also been added to arrive at the social price of inorganic fertilizers and weedicide. Just as is the case in the transportation of imported rice, the transportation cost in distributing these inputs into different parts of the country is also shouldered by the government.

The State Trading Corporation of Bhutan (STCB) imports inorganic fertilizers from India and weedicides are imported by *Karma Tshongkhang*, a private business enterprise. The quantity of fertilizers and weedicide to be imported depends on the demand placed by Druk Seed Corporation (DSC). Upon procuring the inorganic fertilizers and weedicide from STCB and Karma Tshongkhang, the DSC levies 11 percent of the value as handling and storage charges. These inputs are sold to the farmers through Commission Agents. The Commission Agents deposit money for the required quantity of inputs either to the District Agricultural Officers (DAO) or to the regional Offices of the DSC. The DAOs then send the requisition for the inputs along with the Bank Draft to Druk Seed Corporation. Upon receipt of the payment, the DSC dispatches the inputs and pays for the cost of transportation. However, the Ministry of Agriculture reimburses the cost of transporting inorganic fertilizers and

weedicide to the DSC. On top of that, the Commission Agents are paid a commission of 10 per cent on the value of all inputs sold to the farmers. The payment is done through the office of the District Agriculture officer. The social value of inorganic fertilizer and weedicide are therefore much higher than the actual cost paid by the farmers. Table 6.3 shows the import parity prices of fertilizers and weedicide by the different study locations.

Table 6.3. Social price of tradable inputs (Nu/kg)

Variables	Samtse			Lobesa			Paro		
	U	S	W	U	S	W	U	S	W
	----------------------------Nu/kg----------------------------								
DSC's selling rate	5.6	8.9	22.2	5.6	8.9	22.2	5.9	8.9	22.2
Transport charges	0.3	0.3	0.3	0.8	0.8	0.8	0.6	0.6	0.6
Commission	0.6	0.9	2.2	0.6	0.9	2.2	0.6	0.9	2.2
Import parity value at farm gate	6.5	10.1	24.8	6.9	10.6	25.3	6.7	10.4	25.1

U=Urea, S=Suphala, W=Weedicide

6.1.3 Prices of non-tradables

Labour, land, draught animals, and the use of farm machines have been treated as non-tradables in the analysis. The wage rate paid to the National Work Force (NWF) employed to work on the road sides or the state run research farms is Nu.100 per day. The opportunity cost of labour for Samtse has been assumed to be the same as that of the national work force. The prevailing wage rate in Lobesa and Paro are higher than the wage rate paid to the national work force and so the opportunity cost of labour has been kept at the prevailing private wages. The reason for keeping the opportunity cost of labour the same as that of private wage is because of the fact that no farmers would be willing to work on the roadsides as casual labourers when the wage rate is higher by working at the farms. Moreover, farmers from these two areas are hardly found working as roadside labourers as majority of the labourers working on the roads are hired from India. The cost of land has been assumed to be Nu.7,400

per hectare, which is the rate that Druk Seed Corporation normally pays for leasing in land for seed multiplication. The social prices for the use of bullocks and farm machines have been assumed to be the same as that of private prices. The reason being that even if they are hired or rented in and out the rental rate would be the same.

6.2 Social profitability

A social budget (Annex Table 5) was constructed using the quantity of the inputs and outputs and multiplying with their corresponding social prices. The private and the social budget form the basis for filling in the PAM framework (Table 6.4) for further analysis.

Table 6.4. Rice PAM by locations

| | Revenue | Costs | | Profit |
		Tradable Input	Domestic Factors	
-----------------------Nu/ha-----------------------------				
Samtse				
Private prices	22,880	2,739.8	17,799.2	2,341
Social prices	25,168	2,999.6	21,499	669.4
Divergence	-2,288	-259.8	-3699.8	1,671.6
Lobesa				
Private prices	64,550	4,415.36	31,870.8	28,263.84
Social prices	58,095	4,982.4	31,870.8	21,241.80
Divergence	6,455	-567.04	0	7,022.04
Paro				
Private prices	62,725.00	2,121.80	33,488.63	27,114.58
Social prices	55,950.70	2,300.90	33,488.63	20,161.18
Divergence	6,774.30	-179.10	0.00	6,953.4

Looking in to the results from the PAM framework, rice is a privately profitable enterprise in all the three locations. Profit in the table reflects returns to

management and land. Rice farmers in Lobesa earned the highest profit. The profit was as much as 11 times higher than it was earned by the farmers in Samtse . When compared to Paro, the profit was just higher by three percent. The reason for such vast difference in profit between Samtse and the other two locations could be attributed to the difference in yield and the price of the output.   Rice was also socially profitable in the three locations indicating that rice systems would be profitable even in the absence of policy interventions from the government. The divergence in social and private revenues evolved mainly from the rice prices and the prices of tradable inputs.

In Samtse, the private output price of rice was lower than the social price. The reason could be due to market imperfections as the institutes to provide competitive services and full information are not yet fully developed or are inadequate. Another reason for the lower private prices for the output is because the consumers from the area have easy access to the Indian markets where rice can be bought at a cheaper rate. Moreover, the Indian traders and farmers bring their outputs to sell in the local markets especially during the weekends. Farmers in Samtse therefore face stiff competition from the Indian farmers and thus land up getting low prices for their outputs. This is not only the case in Samtse but in all the places along the border with India.   It can therefore be said that because of the common border with India along the southern border, the private price of rice on the Indian side has kept the private price of rice in Bhutan lower as compared to the import parity price.

Even though the social prices were high in all the three locations, it was lower than the private prices in Lobesa and Paro. The reasons for higher private prices in Lobesa and Paro are due to the location's closeness to urban centers where there is demand for local rice from the consumers but then the supply from the farmers in the market is limited. Moreover, the government feels that it is best to let the demand and supply forces to determine the price of local rice in the market.

Social prices of outputs were about 51 percent higher than the f.o.b. price and this can be attributed to the high freight and insurance cost and high land

transportation cost. It however differed among locations because of the different transportation rates for plain terrains and hilly terrains as explained earlier. Social profitability was positive in all the three locations, indicating that rice systems can be profitable even without policy interventions. It however differed among the locations because of differences in the yield of output and the differences in the social price of the inputs. Social profitability was lowest in Samtse and highest in Lobesa. The social profit of Samtse stood at just Nu.669.4/ha and such marginal profit may not encourage the farmers to venture further into rice production. The high positive social profitability in Lobesa and Paro indicates that rice system is efficient in these two locations and thus contributing to the growth of national income. It also shows an incentive in the expansion of paddy cultivation in these two locations provided more land could be converted into paddy land.

Analysis of output transfer showed negative divergence for Samtse suggesting a case of the farmers being taxed on rice production or transfer of resources away from the system. However, it is a clear indication that the farmers received less for their product than what it should have been if they were evaluated at social prices. The farmers received less for their product because of Bhutan's open border with India and with consumers from Bhutan having easy access to the Indian markets while at the same time traders and farmers from the Indian side do sell their rice in the Bhutanese markets especially on weekends. The negative output transfer also do suggest that higher prices for the output could be offered to farmers if rice from these areas (Samtse) with proper domestic distribution and marketing. Locally grown rice could be distributed and marketed in those areas of the country where rice is not grown and that consumers prefer it. Also, if the government had chosen to restrict the supply of imported rice, the private price of the domestically grown rice would have increased to a price equivalent to that of the social price. At that price, domestic production would have increased, import would have decreased and the welfare of the farmers improved through higher earnings from the sale of rice.

On the other hand, the output transfer was positive for Lobesa and Paro. It resulted from the higher private prices for the output as compared to the social price

of the output. The higher private price could be the result of higher demand for local rice in the supply short market. Supply cannot meet demand because rice is more or less grown as a subsistence crop and it is most likely that farmers consume what they grow. Some farmers sell local rice in the market so that additional household necessities could be met. The high private prices enable the farmers not only to meet household necessities but also household food sufficiency by purchasing imported rice. Positive output transfers create subsidies for an agricultural system because they lead to higher revenues.

The negative divergence in the tradable inputs strongly suggests that the inputs supplied to the farmers were subsidized. Though the policy of the government is not to provide subsidy to the farmers, yet the analysis has shown the presence of subsidies being provided to the farmers in terms of tradable inputs. Farmers are not paying the full social costs of the inputs and the divergence represents the cost to the government. Distorting policies like free transportation of the inputs till the location of the Commission Agents (CAs) and the commission paid to the CAs caused the observed market prices of tradable inputs to differ from the comparable world prices. The negative divergence shows the subsidy provided by the government (representing the cost to the government) for a hectare of paddy in the different study locations (Nu.260, Nu.567 and Nu. 179.10 for Samtse, Lobesa and Paro respectively). The government followed the policy of indirect subsidy so that the cost of inputs would be uniform throughout the country and that farmers would use those inputs to increase the yield and production of rice.

The amount of subsidy differed among the locations because of the distance and the transportation cost. Samtse being closer to Phuentsholing (the main port) and being categorized under the plain road had a lesser over all transportation cost and no cost for weedicide as farmers did not report using any. In the case of Paro the low amount of subsidy can be traced back to the lesser quantity of inorganic fertilizers and weedicide used as compared to that of Lobesa. Like wise it was highest for Lobesa because the quantity used was the highest and at the same time the transportation cost was the highest owing to the distance. Therefore, it can be said that the longer the

distance to the destination from the border town, the more the subsidy that would have to be provided for by the government.

Without government intervention, the farmers would have to pay for the inputs, (inorganic fertilizers and weedicide) a price equivalent to that of the social price and the farmers that are further away from the main port would be hit the hardest. Farmers who are located in the remote corners of the country would not be able to purchase any sort of inorganic fertilizers and weedicide without government intervention and the policy of attaining 60 percent self sufficiency in rice would rather seem difficult.

The negative divergences in the non-tradable input for Samtse resulted from the difference in the private and social wage rate. The private wage rate for Samtse was Nu.80 per day while the social cost (opportunity cost of working off the farm; wage rate paid to National Work Force across the country) was Nu.100 per day. Even though the wage rate paid to the National Work Force is same across the country, the opportunity cost of labour in Lobesa and Paro have been assumed to be the same as that of the private wage rate. The reason for keeping it the same is due to the fact that a rational farmer would not be willing to go and work as a National Work Force during the peak agricultural season if the wage rate would be lower than the one prevalent in the village.

Net transfer is the effect of the divergences between the private and the social valuations or sum of all the divergences that cause private profits to differ from social profits (Monke and Pearson, 1989). Looking in to the net transfer, it was positive for all the three locations though it varied among the locations. Positive net transfer indicates that the overall effects of policies and/or market failures on input and output prices are favouring the producers. The policy of the government in keeping the price of tradable inputs uniform throughout the country by providing free transportation has favored the rice farmers in all the three locations. It was lowest in Samtse because the private price of the output was lower than the social price and the social cost of the non-tradable higher than the its private value. The reason being that the daily wage

rate paid for hired labour was Nu.80 per day while the opportunity cost of labour was Nu.100 per day. Moreover such small divergences can be traced back to the yield also. Lower yield results into lower net transfers. Yield in Samtse was low because of a number of factors like:

- Crop damage by wild life
- Poor irrigation facilities
- Unavailability of higher yielding varieties

The positive net transfer in Lobesa and Paro resulted from higher private prices of the output as compared to the social price. The reasons for higher private prices are that consumers with higher income prefer locally grown rice while the supplies of such rice are short in the market. The internal marketing of rice is weak in the country and locally grown rice is available for sale in the market mostly during the weekend while imported rice can be bought from any grocery. Positive social profit in all the three locations indicated that the production of rice could have operated profitably without any policy transfers from the government. The net transfer increased the profits actually received by the farmers. The net transfer of Nu. 1671.6, Nu.7022 and Nu. 6953 per hectare of paddy increased the profits of the farmers from Nu. 669.4, Nu.19631.8, and Nu.18583 to Nu.2341, Nu.28263.84 and Nu.27114.58 for Samtse, Lobesa and Paro respectively.

The world price of rice is much lower than the production cost in Bhutan. However, the import of rice from the world market would be expensive due to high ocean freight and the inland transportation cost from Indian port of Kolkata to the Bhutanese border town of Phuentsholing. Based on the import price, farmers in all the three study locations are earning positive social profit indicating that there is scope for the expansion of this enterprise.