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Global Competitiveness of Nilgiris Tea - A Pam Approach

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ABSTRACT. *In recent years, tea growers and processors of Nilgiris district of India have suffered due to the increasing production cost and decreasing tea price at both domestic and export markets. Tea produced from Kenya and Sri Lanka is popular among importing countries and Indian tea is losing its export share and value. This study aims at examining the global competitiveness of tea produced in Nilgiris district of Tamil Nadu, India. Primary data were collected from 50 tea growers and 10 bought leaf factories. Secondary data were collected from the Tea Board, United Planters Association of Southern India (UPASI), tea exporters and Government of India. Domestic price at Coonoor auction market was compared with international price at Mombosa (Kenya) auction market. Policy Analysis Matrix (PAM) analysis is used to estimate the nominal protection coefficient (NPC), domestic resource coefficient (DRC) and effective protection coefficient (EPC). From this study, NPC, DRC and EPC values were calculated as 0.498, 0.461, and 0.415, respectively. This indicates that the Nilgiris tea is globally competitive and the available resources are utilised efficiently and effectively and there is a vast scope for Nilgiris tea in terms of export to other countries. The EPC value specifies that the government policy and regulations are not in favour of tea export. It also expresses the need of input subsidy and the relaxation of customs duty and export regulations.*

INTRODUCTION

Trade in agricultural produce play a significant role in the economic development of a country (Gulati and Kelly, 2000). Post World Trade Organisation era has witnessed several changes in global agricultural trade necessitated mainly through quality and price. Tea, an important agricultural produce traded in the world market has not been an exception to this rule of law. The present study is an application of Policy Analysis Matrix (PAM) to assess the competitiveness of Nilgiris tea, which is produced under a web of contradictory policies, price supports, and fertilizer, power, irrigation, and credit subsidies. Nilgiris tea contributes a remarkable share in Indian total tea production and export. In the year 2002, Nilgiris produced 62,000 kg of tea, which is about 85% of the total state production and about 23% of the total India production. In Nilgiris, CTC method of tea manufacturing is popular and about 88% of the tea is produced using CTC method and 10% is produced using orthodox method while the rest is green tea production. While Global trade in tea has increased from 859 million kilograms in 1980-81 to 1390 million kilogram in 2001-02,

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India's tea export declined from 224 million kilograms to 180 million kilograms during the corresponding period. Accordingly, India's export share has eroded from 26% to 13%. Nilgiris tea which constitutes about 23% of India's total tea production is characterized by small holdings.

According to the United Planters Association of Southern India (UPASI) report, 56% of the tea produced in Nigiris is consumed domestically and the surplus is exported to over 100 countries. The major importing countries are United Kingdom, Germany, Russia, Poland, USA, UAE, Iron and Saudi Arabia. The price received by Nilgiris tea growers per kg of tea in the year 1998 was Indian Rs. 69 which drastically reduced to Indian Rs. 57 and Rs. 38 per kg in the year 1999 and 2000 respectively. In the year 2002, the price received by the Nilgiris tea growers was Indian Rs. 42. The high cost of production, changes in the government policy, competition from the countries such as Sri Lanka, Kenya and Brazil made tea cultivation less profitable. Above this, tea has to effectively compete with supplementary products like coffee and cocoa. With this in view, an attempt has been made to study the global competitiveness of Nilgiris tea.

MATERIALS AND METHODS

The export competitiveness was examined using Nominal Protection Coefficient (NPC), Domestic Resource Coefficient (DRC) and Effective Protection Coefficient (EPC) as a measure of competitiveness (Yao, 1997). Policy Analysis Matrix (PAM) was used to estimate NPC, DRC and EPC (Gulati and Kelly, 2000).

The policy analysis matrix (PAM) is a computational framework developed by Monke and Pearson (1989) and augmented by Masters and Winter (1995) for measuring comparative advantage, input use efficiency in production and the degree of government interventions. The basic of the PAM is a set of profit and loss identities that are familiar to anyone in business (Nelson and Panggabean, 1991). According to Monke and Pearson (1989), the basic format of the PAM is given in Table 1.

Table. 1 The basic format of the policy analysis matrix

Policy Particulars	Revenues	Cost of tradable inputs	Cost of domestic factors	Profits
Private values	A	B	C	D
Social values	E	F	G	H
Divergences	I	J	K	L

Note: See text for details on A - L

The first row of PAM provides a measure of private profitability (*D*), which is defined as the difference between observed revenue (*A*) and costs (*B* + *C*). Private profitability demonstrates the competitiveness of agricultural system at given current technologies, input and output price, and government policy. The second row of the matrix calculates the social profit which reflects the social opportunity costs. Social profits measure

resource use efficiency and comparative advantage. In addition, comparison of private and social profits provides a measure of resource use efficiency (Mohandy *et al.*, 2002). Positive values for private and social profit indicate that the country uses scarce resources efficiently in a particular sector and has a static comparative advantage in production. Similarly, negative social profits suggest that the sector is wasting resources and that could have been utilized more efficiently in some other sector. In other words, the cost of domestic production exceeds the cost of imports, suggesting that the sector cannot survive without government support at the margin. The third row of the matrix estimates the difference between the first and second rows. The difference between private and social values of revenues, costs, and profits can be explained by policy interventions. The measurements are expressed mathematically as follows.

Private profit (D) = Private revenue (A) – Private cost of tradable input (B) – Private cost of domestic factors (C)
Social profit (H) = Private revenue (E) – Social cost of tradable inputs (F) – Social cost of domestic factors (G)

Output transfers I = A-E
Input Transfers J = B-F
Factor Transfers K =C-G
Net Policy Transfers L = D-H

Nominal protection coefficient (NPC) from PAM

Nominal protection coefficient is a straight forward measure of competitiveness. It is calculated as a ratio between the domestic price of tea to the international price of a comparable grade of tea, adjusted for all the transfer costs such as freight charges, insurance charges, handling costs, marketing margins, losses etc. Nominal Protection Coefficient of tradable output is estimated as,

NPC on tradable outputs = A/E

NPC value of less than one indicates that the product is globally competitive.

Domestic resource coefficient (DRC) from PAM

The DRC ratio measures the relative efficiency of domestic production of tea in terms of its international cost competitiveness. The DRC measures the opportunity cost of using domestic resources like land and labour, and tradable inputs in domestic production to the value added to the products at border price. The DRC indicates whether the use of domestic factors is socially profitable (DRC<1) or not (DRC>1). Domestic Resource Coefficient is measured as,

$$DRC = \frac{G}{E - F}$$

Effective protection coefficient (EPC) from PAM

EPC is an indicator for measuring the trade price and exchange rate related distortions through tradable input and output price of the value added to a particular product (Canosanz, 1987). EPC determines transfers due to distortions in input as well as output price *i. e.* output prices (gross value) less specified (usually variable) traded input costs. An EPC value of greater than one suggests that government policies provide positive incentives to producers while values less than one indicate that producers are not protected through government policy (Ashlatha, 2000). EPC is estimated as,

$$EPC = \frac{A - B}{E - F}$$

The major strength of PAM is that it allows varying degrees of disaggregation (Yao, 1977) and provides a straightforward analysis of policy-induced effects. Despite its strength, PAM approach has been criticized because of its static nature and some do not consider the results in dynamic settings (Nelson and Panggabean 1991). One of the ways to overcome this limitation is to conduct sensitivity analysis under various assumptions (Yao, 1997). For this analysis, primary data on costs and returns were colleted through a survey of 50 tea growers and 10 bought leaf factories in Nilgiris district of Tamil Nadu, India. The international price of tea published by tea statistics were also collected. The freight charges, transportation charges and port clearing charges were collected from tea board, UPASI and tea traders. Tea price at Mombosa (Kenya) market is considered as the world reference price.

As mentioned by Monke and Pearson, (1989), PAM requires private and social value for revenue and tradable and non tradable (domestic factors) inputs. The private revenue value is the farm gate price of Nilgiris tea. The social revenue value is calculated by adding marketing costs to the Freight on Board (FOB) price of Mombosa tea. Above this insurance, freight and other transportation charges are added to FOB price. The price is then converted into Indian currency (conversion factor Rs.1= 1.8 Kenyan shillings).

Tradable inputs such as plant protection chemicals, weedicides, micronutrients and tea processing units, and non tradable inputs such as land and labour (Ravi and Reddy, 1997) are taken into consideration for this analysis. Private tradable input value is calculated by adding the amount spent on each of these inputs by Nilgiris tea growers. Land value is calculated as 5 percent of the total revenue (Gulati, 1987). According to Yao (1997), the most difficult task in constructing PAM is estimating the social prices of inputs and outputs of tradable and non-tradable components. The social value of tradable input is estimated by using world reference price (FOB price at Kenya market) or by adding the amount spent on each of the input at Kenya. Then, the cost is converted to Indian currency.

RESULTS AND DISCUSSION

The results of the PAM are presented in Tables 1 and 2. In Table 1, the private and social value is positive suggesting that the scarce resources are used efficiently in tea production and that Nilgiri tea have the static comparative advantage. According to Table 2, nominal protection coefficient (NPC) value for the year 2002 is 0.498, which is less than

one. It implies the competitiveness of Nilgiris tea. The NPC value under importable and exportable hypothesis analysis is 0.44 and 0.55 respectively, which further assure PAM results (See Annex). These results coincide with Mahesh (2000) findings that reveal Indian tea is competitive with Sri Lankan and Chinese tea. Domestic resource coefficient (DRC) of Nilgiris tea for the year 2002 is 0.461. This indicates that the opportunity cost of domestic resource is smaller than the net foreign exchange gained in export and thus Nilgiris tea is more competitive than Kenya tea. Paradoxically, while measuring the competitiveness of Indian tea with Sri Lankan tea, Mahesh (2000) found that the DRC value is more than one. This shows that, labour and input cost is cheaper in Sri Lanka compared to India. From this it is obvious that Nilgiris tea growers need to spend less than Rs. 1 to earn a rupee equivalent of foreign exchange. Thus, it is profitable for the Nigiris farmers to use available tradable and non-tradable inputs in tea production.

EPC value is a more reliable indicator of the effective incentives than NPC, as the former recognises the full impact of policies such as price enhancing effects (import tariffs) and cost reducing effects (input subsidies) (Mohandy *et al.*, 2003). Effective protection coefficient (EPC) value of Nilgiris tea for the year 2002 is 0.415, which is positive and less than one. It indicates that, the value added to Nilgiris tea at border price is higher than the value added at domestic price, and hence the output is competitive even if supports are removed. Though the positive value of EPC reveals the competitiveness of Nilgiris tea, the value of less than one indicates the failure of government policy and regulations to favour the tea export. The Policy Analysis Matrix, NPC, DRC and EPC results show that the Nilgiris tea is globally competitive and that there is a vast scope for export.

Table 1. Policy Analysis Matrix of Nilgiris Tea

Policy Particulars	Revenues	Cost of tradable inputs	Cost of domestic factors	Profits
Private values	27347.67	5921.00	10745.00	10681.67
Social values	54904.50	3285.98	23821.35	27797.17
Divergences	-27556.80	2635.02	-13076.40	-17115.50

Table 2. Policy Analysis Matrix results

Particulars	Value
NPC	0.498
DRC	0.461
EPC	0.415

CONCLUSIONS

Nilgiris have a comparative advantage in tea production by which it can export the surplus production and earn foreign exchange. NPC, DRC and EPC values show that Nilgiris tea is globally competitive and there is vast scope for the growers to increase export. The reduced production cost coupled with government subsidy makes the Nilgiris tea

globally competitive. The availability of cheaper tradable and non tradable inputs and the lower labour cost facilitate the growers to produce tea at the minimum possible cost. EPC value suggests the need of the government to modify the current policy and regulations to favour Nilgiris tea production and export. The present government policies such as reduction in fertilizer and chemical subsidy, complicated export procedure, increasing tariff, cess and taxes hinder the tea production and export. Under the Globalization and world trade organization (WTO) treaty, the Indian government is forced to reduce the input subsidy and other farm subsidy which in turn may affect the competitiveness of Nilgiris tea. Government can facilitate tea production and export by simplifying export procedures, formulating Agri Export Zones (AEZ) for tea, removing export tariff and improving trade agreement with other countries.

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Annexes

Annex1. Importable hypothesis to measure nominal protection coefficient

Sl.No.	Particulars	2002 (Rs/kg)
1.	FOB at outside port	75.460
2.	Insurance	0.760
3.	Freight charges upto domestic port	0.890
4.	Exchange rate	4 8.630
5.	CIF price at port (1+2+3)	77.110
6.	Port clearance charges	1.350
7.	Landed cost at domestic port (5+6)	78.460
8.	Transportation upto local market	0.946
9.	Marketing margin	1.803
10.	Reference price (7+8+9)	81.209
11.	Domestic price (auction price)	36.080
	NPC (11/10)	0.444

Annex 2. Exportable hypothesis to measure nominal protection coefficient

Sl.No.	Particulars	2002 (Rs/kg)
1.	Price as domestic market	36.080
2.	Transport charges	1.088
3.	Marketing margin (5% of domestic price)	1.804
4.	Port clearing charges	1.350
5.	FOB Price (1+2+3+4)	40.322
6.	Freight charges	0.899
7.	Insurance (1% of price)	0.362
8.	Landed cost (5+6+7)	41.583
9.	Exchange rate	48.625
10.	CIF price	41.583
11.	Reference price	75.460
	NPC (10/11)	0.551