PN-AAW-533

RESEARCH AND PLANNING PAPER SERIES

Number 3 November 1986

FACTORS AFFECTING THE TARAI PADDY MARKET: PRICING POLICY IMPLICATIONS

Manohar Sharma

HMG-USAID-GTZ-IDRC-WINROCK PROJECT

STRENGTHENING INSTITUTIONAL CAPACITY IN THE

FOOD AND AGRICULTURAL SECTOR IN NEPAL

FOREWORD

This Research and Planning Paper Series is funded through the project, "Strengthening Institutional Capacity in the Food and Agricultural Sector in Nepal," a cooperative effort by the Ministry of Agriculture (MOA) of His Majesty's Government of Nepal and the Winrock International Institute for Agricultural Development. This project has been made possible by substantial financial support from the U.S. Agency for International Development (USAID), the German Agency for Technical Cooperation (GTZ), and the Canadian International Development Research Centre (IDRC).

One of the most important activities of this project is funding for problem-oriented research by young professional staff of agricultural agencies of the MOA and related institutions. In particular, funding is provided by the IDRC to support the activities of the Research and Planning Unit (RPU) of the Agricultural Projects Services Centre (APROSC). This research is carried out with the active professional assistance of the Winrock staff.

The purpose of this Research and Planning Paper Series is to make the results of the research activities of APROSC's Research and Planning Unit available to a larger audience, and to acquaint younger staff and students with advanced methods of research and statistical analysis. It is also hoped that publication of the Series will stimulate discussion among policymakers and thereby assist in the formulation of policies which are suitable to the development of Nepal's agriculture.

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Michael B. Wallace
Series Editor

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FACTORS AFFECTING THE TARAI PADDY MARKET:

PRICING POLICY IMPLICATIONS

Manohar Sharma*

OVERVIEW

A basic concern of His Majesty's Government of Nepal (HMG/N) is to raise the nutritional status of the population, which is presently well below prescribed levels. The Central Food Research Laboratory of Nepal recommends a minimum intake of 2456 calories per adult per year in hill and mountain areas, and 2256 calories per adult per year for the Tarai. Foodgrains--rice, wheat, and maize--constitute the main staple of the Nepalese diet and provide 80 to 85 percent of the total caloric intake. Using these figures, the national shortfall in foodgrain consumption has been estimated to be about 15 percent (APROSC, 1982a).

When the national average per capita consumption of foodgrain during 1980/81 was estimated to be around 143.78 kg per year, per capita consumption in the hill and mountains (112-138 kg per year) was much below that in the Tarai (159 kg per year) (Table 1). Reasons for this disparity are twofold: the first relates to the rate of increase and the geographical dispersion of the national population and the resulting employment and income distribution; the other refers to the lack of physical infrastructure linking different parts of the country and the consequential movement of trade, costs, and prices.

Geographical distribution of agricultural land is sharply divergent from that of the national population. While two-thirds of Nepal's people live in the hills, one-third in the Tarai, nearly two-thirds of the agricultural land is in the Tarai and only one-third in the hill areas. Traditionally, the hill and mountain regions produced sufficient foodgrain for the local population. In addition, the prevailing Jagir and Birta systems of land-ownership enabled absentee landlords and the ruling elite residing in the hills to extract part of the foodgrain surplus from the very sparsely populated Tarai. The remaining Tarai surplus was then profitably exported to India.

The rudimentary exchange system that existed between the hill and mountain areas, and the Tarai, through which surplus non-foodgrain items such as livestock and dairy products from the former were exchanged for foodgrain from the latter, was adequate to stave off occasional food shortages in the uplands. Except for the establishment of a system of land revenue collection and a corresponding extractive class of absentee landlords, the economies of these regions were only loosely integrated.

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Table 1. Estimated Per Capita Consumption of Foodgrains in Different Ecological Belts of Nepal, 1980/81 (kg)

	Mountains		Hills		Tarai		Nepal	
	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Rice	23.184	20.0	47.967	34.8	104.514	65.6	67.766	47.1
Maize	51.680	46.1	61.307	44.5	29.058	18.2	47.842	33.3
Wheat	18.624	16.6	14.170	10.3	21.199	13.3	17.320	12.0
Millet	12.703	11.3	12.762	9.3	3.038	1.9	8.962	6.2
Barley	5.997	5.3	1.454	1.1	1.506	1.0	1.890	1.4
Total	112.188	100.0	137.660	100.0	159.315	100.0	143.780	100.0

Source: FAMSD, Food Balance Sheet of Nepal, 1980/81.

The recent rapid population increase in Nepal has rendered the traditional food supply arrangement inadequate. By 1946, the government had to establish a Food Commission to plan and supervise state procurement and provision of Tarai foodgrains for civil servants and the military forces in the hills at reasonable prices (APROSC, 1982b).

The declining food self-sufficiency of the uplands became particularly alarming during the last decade. The population of these regions grew at a rate of 1.6 percent per annum during 1971-1981. Production of foodgrain in the mountain belt, however, actually declined at a rate of 1.26 percent per annum, while the hill belt recorded a meager growth rate of only 0.17 percent per annum. The region's foodgrain deficit, defined as the difference between production and consumption requirement, increased from 69,180 mt during 1974/75 to 233,418 mt during 1980/81, the periods for which data are available. No data exists to show the extent to which these deficits have been met by foodgrain supplies from the Tarai. However, such flows have been clearly inadequate (HMG/N, 1984).

The primary reasons for the increasing foodgrain deficit are negligible growth of cultivated areas, and a decline in yield rates despite a rapidly increasing population. This trend of reduced crop productivity, however, has not brought about a shift to more profitable non-farm enterprises. The same factors causing a decline in per capita foodgrain production also reduced the per capita surplus of non-foodgrain items, primarily agricultural and livestock products, traditionally traded for grain from the Tarai.

A new type of surplus began to emerge--labor. Initially, a substantial chunk of the Tarai was 'frontier' land. Lack of an adequate livelihood in the hills and mountains led to a wave of 'farming families' permanently migrating to the Tarai. These families converted forests into agricultural land. However, the Tarai's capacity to absorb the increasing flow of migrants was limited. The second wave from the hills were, therefore, seasonal migrants who travelled down to the Tarai

to work as farmhands or casual laborers to earn cash and/or food supplies for their families living in the hills. One study estimates the rate of migration from the hills to the Tarai at 0.7 percent per annum.

In addition to low income levels, the ability of the people living in the uplands to import grain from the Tarai is constrained by the lack of physical infrastructure connecting the two regions. Only 41 of the 75 districts in the country are linked by motorable roads. The length of motorable roads in Nepal in 1979/80 totalled 4940 km of which 2785 km (50.7 percent) were in the Tarai. There are 39 airports, including 25 STOL airstrips, in the different parts of the country. Though air service is used mainly for passenger traffic, it is also used to transport grain to the most remote parts of the country, particularly during emergencies.

First, the absence of a physical infrastructure makes moving grain from the Tarai very costly. Transportation is a major cost item because of the difficult terrain in the deficit districts. Grain is moved by vehicles, animals, porters, and planes and, frequently, has to be handled several times before reaching the final market destination. The high prices at which grain is retailed in the hills hampers effective demand. Considering the fact that private traders' allocation of foodgrain sales to the hill and mountain areas is based on their calculation of purchasing power in this region in terms of cost and profit margins involved with moving grain it is evident this region attracts only a small part of the Tarai surplus.

Second, the lack of physical infrastructure has also imposed a constraint on the expansion of non-crop production activities that could augment incomes in the hills and be exchanged for foodgrain from the Tarai. The comparative advantage of the hills in horticultural, livestock and dairy production remains unexploited primarily because the lack of roads forms a formidable barrier to product marketing.

HMG/N has recognized the need to develop a viable exchange system between the uplands and the Tarai. In fact, one of the core elements of HMG/N's Fifth Five Year Plan (1974/75-1980/81) was to initiate development on the basis of regional comparative advantage. The plan emphasized agricultural production on the basis of agro-climatic suitability. While the Tarai belt was earmarked for cereal and foodgrain production, the hills and mountains were to develop a long-term specialization in horticulture, livestock and dairy farming.

This approach was abandoned in the Sixth Plan, which emphasized grain production in the hills as well as the Tarai. The main factor determining the abrupt change was the need to find a shorter-term solution to deteriorating food supplies in the hills. As a result, achievement of regional self-sufficiency still remains a cornerstone of the national food policy. Actual achievement of regional self-sufficiency, however, remains a distant goal.

Even in the Tarai, where the most suitable land for cultivation exists and where considerable investments in building physical infrastructure and establishing agricultural support services have already been made, growth in foodgrain production (1.5 percent per annum) has failed to match that of the population. In spite of this, the Tarai

continues to produce a foodgrain surplus. This surplus is either exported and/or marketed within the country depending on prevailing trade regulations, costs and prices.

EXPORT DEMAND

The market destination of this surplus has a crucial bearing on the welfare of the economy. While this surplus could provide a substantial amount of foreign exchange through exports, the national objective of improving the nutritional status of the domestic population, two-thirds of whom live in the hills cannot be forgotten. Channeling the surplus foodgrain of the Tarai into exports and domestic consumption in appropriate amounts thus forms one important aspect of national food policy.

In the Tarai, an oversupply develops especially during the post-harvest season when market arrivals reach a peak. Effective demand from Nepal's hill and mountain areas is very limited. Export demand, however, is readily forthcoming, particularly from the food-deficit Indian states of West Bengal and Bihar and pockets of Uttar Pradesh where foodgrain prices are usually much higher than in the Tarai. This price differential attracts a movement of foodgrain from the Tarai into India and influences prices in the Tarai.

It is important to note that the close link of the Tarai markets with bordering Indian markets need not be harmful to the national economy. After all, export allows Nepalese producers/ consumers to reap the profit from trade. However, the need to regulate foodgrain trade arises in the larger context. The loose integration between Nepal's two economic regions results in an ironic situation. A substantial volume of foodgrain flows into India not because domestic consumption requirements have been met, but because of the domestic producer's lack of purchasing power and the physical barriers between markets in the uplands and the Tarai. There has been no definitive assessment of the quantity of foodgrain sold across the border because the transactions which take place along the 1,000 km open border are not recorded. Estimates range from 100,000 to 250,000 mt a year (World Bank, 1983).

A blanket ban on exports, however, is hardly an appropriate solution since enlarged domestic supplies of foodgrain are not automatically accompanied by matching increases in effective demand for food. This deficiency in demand can be traced to inadequate growth in purchasing power of low-income groups who spend the bulk of increases in income on food. The constraint of inadequate purchasing power coupled with transportation difficulties limits the consumption of food and is responsible for many of the nutritional problems in the country. The existence of huge surpluses of foodgrain in the Tarai, side-by-side with below-subsistence consumption levels in both the uplands and the Tarai, make this evident.

However, it can still be argued that a curb on exports could effectively reduce prices at home. Policymakers have to face the inherent conflict between providing low-priced foodgrain to consumers and maintaining remunerative prices to producers. Price changes provide a compensatory effect to changes in output. If prices are kept rigidly stable in spite of sizable output decline, a fall in farmers' incomes

might result. If, on the other hand, farmers' incomes are rigidly stabilized, this might be at the expense of consumers' real incomes. Apart from producers' incomes, there is also the question of how farmers respond to changes in foodgrain prices through shifts in acreage devoted to different crops or to the marketed quantity of a particular crop.

There is always the danger that an obsessively consumer-oriented policy, based on rigid control of foodgrain prices and trade movement, might backfire with reduced production and, therefore, less grain to go round than in the initial situation. Consideration of these factors leads to the inescapable conclusion that, in the long run, a match between growth in foodgrain production and effective demand for food is necessary not only to meet nutritional objectives, but also to maintain remunerative prices essential to rapid growth in food production.

MARKETING CHANNELS

Rice is the major foodgrain traded in Tarai markets. It is estimated that only between 15 to 20 percent of the marketable paddy surplus is processed at the farm level.

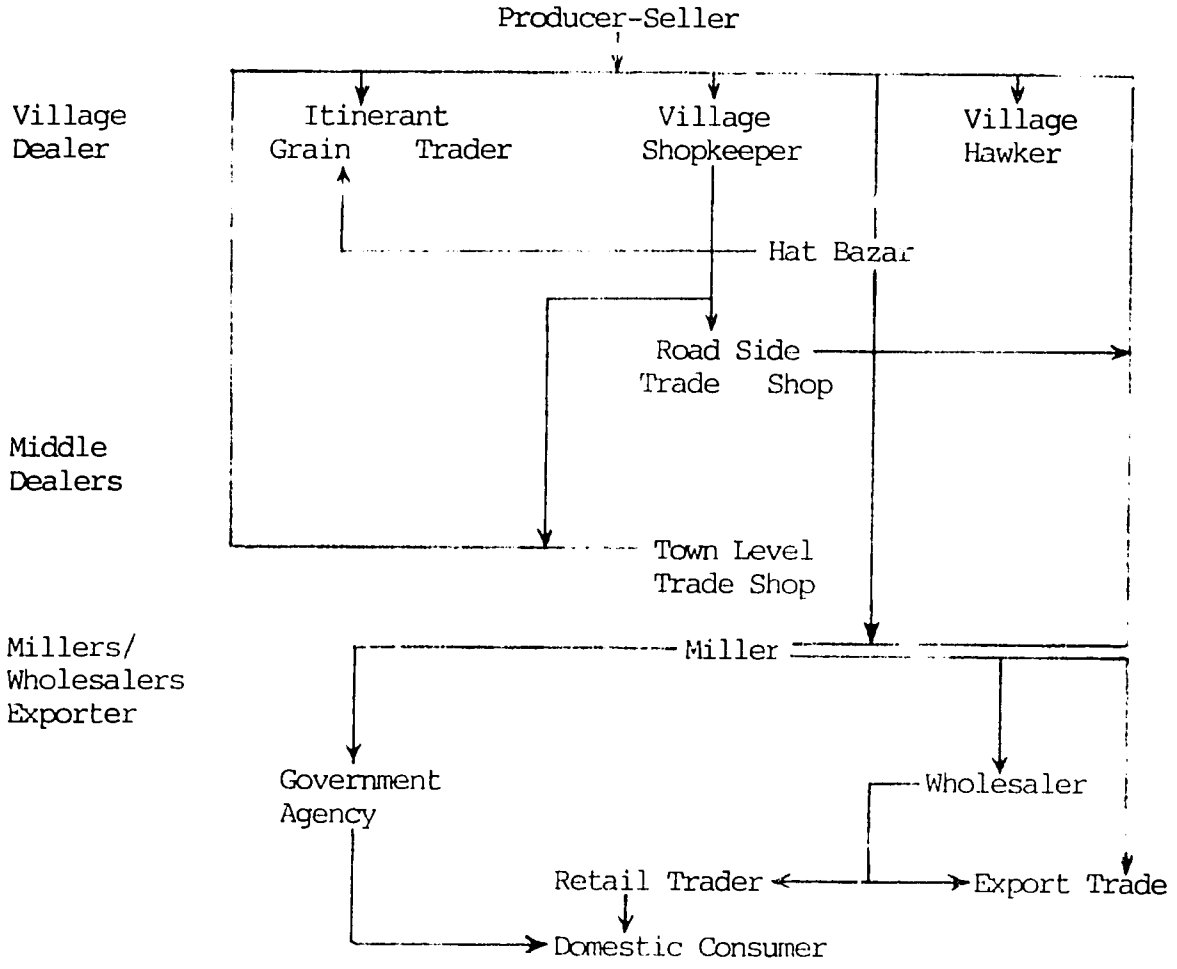
Although paddy harvesting is generally over by mid-January, markets often keep receiving paddy until the middle of March. The large time-spread of the market arrivals is due to market speculation by big farmers and traders, and intermittent sales by small farmers closely responding to their cash needs. Though a number of mills start operation in September, some, especially the smaller ones, delay operation until November, when paddy becomes drier and milling recovery improves. The time chosen to start operation also depends on the announcement of the government purchase policy. However, mills start storing produce as soon as substantial arrivals reach the market.

A three-tier market for paddy exists in the Tarai (Figure 1). At the village level itinerant traders, local shopkeepers and village merchants buy paddy from producers. Village-level markets are the venue for small farmers to sell their foodgrain. Small producers who have meager quantities of marketable surplus and no transport facility, have no option but to sell in these markets.

Middle-level dealers purchase paddy from mobile collectors, village dealers, and small producers who do not have enough volume to sell directly to the millers, since mills usually require a minimum transaction size of a quintal because of the costs of separate handling. Large mills and big wholesalers receive paddy from middle-level dealers, but they also purchase paddy from large farmers. These millers and traders process and either export or sell the paddy within the domestic market.

At this level, there is a high degree of market concentration by a small number of wholesalers (APROSC, 1981). The wholesalers' control of the market is strengthened by extensive vertical integration. These wholesalers own the largest mills in the Tarai, with capacities ranging from 15 to 20 quintals per hour, and thus command a major share of the paddy market (APROSC, 1982b).

Figure 1. Marketing Channels for Paddy in the Tarai



An APROSC study indicates that big millers purchase about 72 percent of their paddy from middle-level dealers. Often paddy is purchased from farmers, middlemen and village traders.

High market concentration assumes significance in relation to effective market areas. Paddy production in the Tarai is segmented into natural markets: eastern, central and western Tarai. Each has a marketing hub and a controlling area determined by the surrounding topography and transportation facilities. Middle-level dealers seldom transport paddy to sell outside their natural markets.

A study by Johl indicates that the price spreads between these natural markets are significantly higher than the level justified by transportation costs indicating "some serious bottlenecks to the flow of commodities and marketing information" (Johl, 1981). The same study suggests that this might be the result of "an informed apportioning of the market in the Tarai area by a few trader magnates." Although there are no formal barriers to operating across areas of influence, the trade magnates seem to have tacitly agreed not to trend on each others' toes. The domination of a few large traders in each market and their control of essential processing capacity thus provide the structural conditions for oligopsonistic power of the paddy market.

Market concentration is relatively low at the middle level, mainly because of the large number of participants, suggesting a structure at least consistent with competitive behavior (APROSC, 1982a).

As only a handful of traders operate in each market on the village level, a higher market concentration than the middle level may be expected. Such markets are often rigidly defined by the cost of transporting grain over the surrounding networks of unpaved roads, where trucks often give way to bullock carts during the rainy season. This situation results in producers receiving a lower price for their paddy.

The extent to which oligopsonistic power can be countered depends, among other things, on the way in which producers respond to price changes. An econometric study on the acreage response of farmers to lagged prices (APROSC, 1981) indicated that for paddy and wheat, the short-term supply schedule is relatively inelastic. Taking the extreme case where producers' elasticity with respect to price approaches zero, the only limit to the power of oligopsonist traders would be the threat of new firms entering the market.

The large traders/exporters have the advantage of their recognized positions in the domestic and the export market. Foreign importers trust them to honor forward contracts. Economies of scale in securing knowledge of the export market as well as domestic markets benefit established large-scale traders. Communication facilities available to them are superior and they are able to participate in a relatively sophisticated and expensive network of market information. Large capitalization would be required of middle-level dealers to realize the benefits of scale enjoyed by the top trading houses. The size of the required investment in inventory alone restricts potential entry.

PRICE FORMATION

The demand curves for paddy at all levels of the market are derived from the demand curves of domestic rice consumers. Foregoing analysis has shown that prices are formed in the Tarai on the basis of a limited internal outlet for Tarai surplus, the oligopsonistic power of large-scale traders, and the 1,000 km open border with India facilitating foodgrain transaction.

In the absence of any control on the export trade of rice, the domestic price of paddy would be determined by the export price. However, if the export trade in rice is rigidly controlled through export quotas and strict licensing procedures to protect the maintenance of reasonably priced domestic supplies, then the domestic demand for rice will also affect the domestic price.

HMG/N now uses a policy of quantitative restrictions on export as a means to stabilize the domestic price of rice. Export quotas are fixed by the government on the recommendation of the Food and Marketing Services Department (FAMSD) of the Ministry of Agriculture. The FAMSD recommendation is based on the exportable surplus that it calculates from the national food balance sheet which the FAMSD annually prepares. Once the exportable surplus has been calculated, a quota is allocated to each zone of the Tarai. During 1980/81 this quota was 100,000 mt.

Exports of rice are also subject to an export tax. In the past, all exported rice was subject to a levy system in which a predetermined proportion of the exported quantity had to be surrendered to the NFC at special levy prices. Levy procurement was envisaged to be an effective means of utilizing rice export profits to meet the cost of distribution in the deficit regions of the country. Levy procurements provided all of NFC's rice requirements during 1974/75-1978/79 (APROSC, 1982a).

The proportion of exports that had to be surrendered to the NFC in this way ranged from 25 to 30 percent during 1974/75-1976/77 (Mudbhary, 1983). Levy rates have, however, been totally withdrawn on rice exports to India, and reduced to ten percent on export to other countries.

Table 2. Rates of Levy on Export and Levy Price of Rice (74/75-82/83)

Rates of Levy on Export	
From mid-February to mid-May 1975	25 percent
From mid-May to the fourth week of February 1976	30 percent
From the fourth week of February 1976 to mid-November 1976	25 percent
From mid-November 1976 to mid-November 1980	20 percent
From mid-November 1980 to date (March 1983)	10 percent only on exports to overseas; no levy on export to India
Levy Price of Rice	
From 1974/75 to mid-November 1980	Rs. 139.32/qtl
From mid-November 1980 to date (March 1983)	Rs. 200.00/qtl

Source: NFC.

A customs duty on rice exports is still operative. Rice exports to all destinations are taxed at the rate of Rs.0.10 per kg. Export taxes, however, have not been used as a policy variable and have remained more or less constant during the last seven years.

Table 3 shows recorded exports of rice for 1974/75-1981/82. With the exception of 1975/76 and 1976/77, recorded exports have accounted for less than 13 percent of the Tarai surplus of rice. Furthermore, such exports have been consistently below the national level of surplus. This indicates that either substantial stockpiling of rice occurs within the country or actual exports substantially exceed recorded exports. The first possibility can be quite easily ruled out as no incentive exists for either producers or traders to stockpile rice. Average year-end stocks held by public sector agencies have been only nominal. Considering the limited internal outlet for the Tarai surplus and the open border with India along which substantial unrecorded trade in all com-

modities takes place, it is reasonable to expect actual rice exports to exceed recorded exports.

Table 3. Quantity and Unit Price of Rice Exports (1974/75 - 1981/82)
(Quantities in mt, Price in Rs/mt)

Destination	India			Other Countries			Total	
Year	Quantity	%	Unit Price	Quantity	%	Unit Price	Quantity	Unit Price
1974/75	66112	100.0	4276	-	-	-	66112	4276
1975/76	157716	100.0	3141	-	-	-	157716	3141
1976/77	129216	100.0	2654	-	-	-	129216	2654
1977/78	17984	28.6	2586	44931	71.4	2721	62915	2682
1978/79	5407	8.0	2462	62191	92.0	3137	67598	3083
1979/80	880	7.2	3346	11336	92.8	2833	12216	2879
1980/81	40002	88.0	2939	5451	12.0	4426	45453	2870
1981/82	36503	59.1	4561	25211	40.9	4955	61714	4722

Source: Nepal Rastra Bank.

Interviews with farmers, traders, and district officials in areas along the border have indicated that in many cases it is not possible to enforce trade restrictions with India. One clear point that emerged during these interviews was that a great part of the across-the-border trade in foodgrain is executed by traders and not by farmer-producers. Reasons for this are several. First, farmers do not have enough access to market information, especially on markets across the border. Second, because farmers have small amounts of surplus foodgrain, transaction costs which include a risk premium deter them from making direct sales in Indian markets. Third, prices are not consistently higher on either side of the border and opportunity for profitable trade often requires the holding of speculative stocks which small farmers are usually unable to do. Fourth, across-the-border trade often requires collusion and extensive linkages which farmers are not in the position to develop.

Previous studies have suggested that the most potent factor in the paddy-rice price determination is the magnitude of exports and that the internal price practically amounts to a derived price (Johl, 1981). If this is so, a close relationship between domestic rice prices and those in the bordering states of India can be expected, as opposed to a relationship between rice prices and domestic production.

Regressing the national price index of rice against national paddy production yields the following equation.

$$(1)\quad NRP = \underset{(0.\ )}{18.71} + \underset{(0.28)}{0.05}\ NRPR \qquad R\text{-squared} = 0.17$$

t-statistics in parentheses

Equation (1) shows that the effect of domestic rice production on the national rice price index is not only weak, as the coefficient of correlation indicates, but is actual tenuous, as the sign of the coefficient of national rice production is positive.

Regression of the Tarai rice price index with Tarai paddy production yields similar results.

$$(2)\ TRP = 15.09 + 0.067\ TRPR \qquad R\text{-squared} = 0.21$$
$$(0.18) \quad (1.51)$$

Equations (1) and (2) could indicate that Nepal's rice prices are determined by factors unrelated to domestic supply levels. However, this is a simplistic interpretation. Serious problems related to proper identification of variables arise when using a single equation model.

Estimated regression equations, to test the price relationship with Indian markets, are shown in Table 4.

Table 4. Price Relationship Regression Equations

Ind Var / Dep Var	Bo	Bihar Rice Price	Exchange Rate	R-squared
NRP	-392.003	0.393	340.576	0.71
	(-2.33)	(2.38)	(2.76)	
TRP	-217.025	0.537	263.831	0.78

Ind Var / Dep Var	Bo	West Bengal Rice Price	Exchange Rate	R-squared
TRP	-434.693	0.458	336	0.95
	(-6.16)	(9.74)	(6.98)	
NRP	-506.92	0.362	399.681	0.88
	(-4.26)	(4.56)	(4.92)	

Ind Var/ Dep Var	Bo	Up Price Rate	Exchange Rate	R-squared
TRP	38.179	0.907	12.463	0.83
	(0.26)	(4.39)	(0.11)	
NRP	-128.839	0.734	13.968	0.81
	(-0.87)	(3.45)	(1.27)	

All of the regression equations estimated indicate a strong influence of rice prices in the Indian states of West Bengal, Bihar, and Uttar Pradesh on rice prices in the Tarai and Nepal as a whole. Coefficients of determination across equations show this influence to be slightly greater in the Tarai.

When the monthly price movements in major Tarai rice markets are compared to those in closely-proximate Indian markets, it is clear that prices on both sides of the border follow a similar trend. In an earlier APROSC study, a relatively high correlation was found between the price of coarse paddy in Biratnagar, Birgunj, Bhairahawa and Nepalgunj in Nepal and Poornia, Muzaffarpur, Gorakhpur and Baharaich in India during 1978-1981.

Table 5. Correlation Matrix of Coarse Paddy Prices in Nepalese and Indian Markets

Nepalese Markets	Indian Markets			
	Poornia	Muzaffarpur	Gorakhpur	Baharaich
Biratnagar	0.48	0.55	0.27	0.51
Birgunj	0.22	0.52	0.39	0.76
Bhairahawa	0.66	0.61	0.21	0.49
Nepalgunj	0.83	0.78	0.59	0.84

Based on data obtained from Nepal Rastra Bank, Central Office.
Source: "Nepal: Food Marketing and Price Policy Study," APROSC, 1981.

Based on an analysis of weekly rice and paddy prices in Birgunj and Raxaul, the same study also demonstrated that price changes on the Indian side of the border produced instantaneous changes in Nepalese prices, indicating a high degree of Nepalese market sensitivity to markets across the border.

At another level, little relationship was found to exist between rice prices and production of paddy in the hills:

$$NRP = \underset{(0.47)}{52.31} + \underset{(0.71)}{0.149}\ HRPR \qquad R\text{-squared} = 0.06$$

Again, the factors affecting estimation of regression equations (1) and (2) also affect this estimation, thus no strong conclusion can be drawn.

Rice prices in the hill regions on the other hand, were found to be highly correlated with rice prices in the Tarai. This is an expected result as foodgrain deficit hill areas import foodgrain from the Tarai.

$$HRP = \underset{(0.31)}{-4{,}752} + \underset{(8.96)}{0.984}\ TRP \qquad R\text{-squared} = 0.91$$

The above findings indicate that actual exports of rice appear to be much greater than recorded exports, and the destination of these unrecorded exports are the adjoining Indian states. Consequently, prices in the Tarai are influenced by prices in the bordering Indian markets given the small size of the Nepalese market. At home, the large-scale trader/exporters enjoy considerable oligopsonistic power while the remaining middlemen remain competitive and simply transmit prices to the producers.

The process of price determination is graphically illustrated in Figure 2. Here De represents the Indian demand for rice as it appears to Nepalese exporters--horizontal because they are price takers. The exporters' demand curve for paddy from middlemen is Dmd. The difference between the two curves is equal to the cost of marketing and the cost of processing services provided by the exporters. At the next level, Dvd represents the demand curve of the middle-level dealers who purchase paddy at the village level. The vertical distance between Dvd and Dmd represents the economic costs of marketing. The demand curve of the

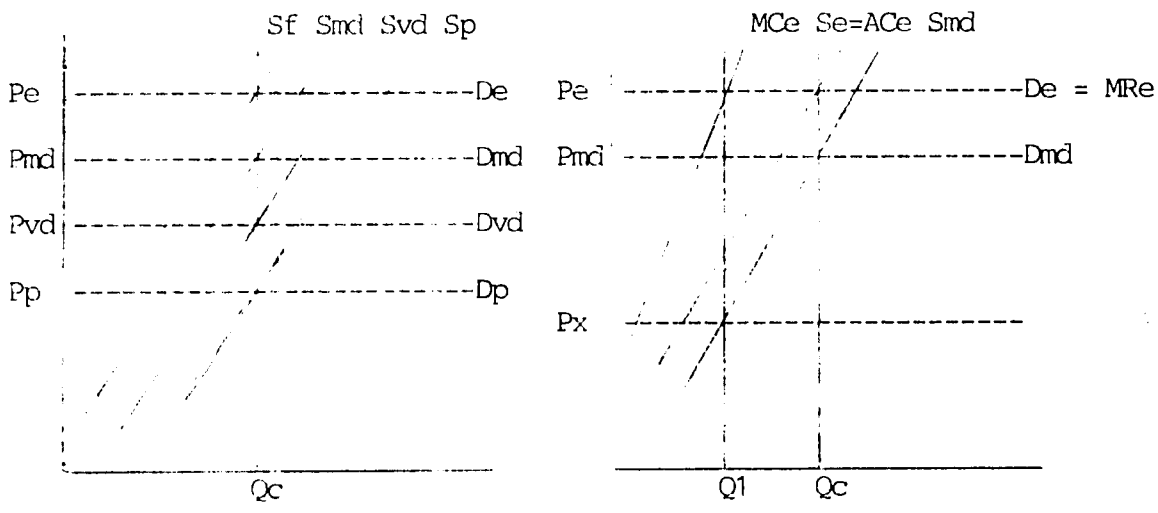
village dealers for paddy from producers is represented by Dp. The equilibrium price is established at Pp at the intersection of the Dp curve and the producers supply curve Sp. The Supply curves at higher levels are derived curves equal to the supply curve at the preceding level plus the marketing and/or processing costs.

Within such a system, shifts in the Indian market demand curve will be the source of price changes. Shifts in the supply curve of producers would cause changes in the equilibrium volume of production but would have no effect on prices.

If no collusion existed at the exporter level, no single exporter could purchase paddy below Pmd, the competitive market price. If collusion does exist, then exporters can uniformly reduce their prices and still obtain paddy, although the quantity would depend on supply, thus realizing oligopsony gains. The Smd curve represents the average cost of purchasing paddy from middle dealers under competitive conditions. This is also equal to the marginal cost. With collusion and uniform reduction in prices, marginal costs decline faster than the average costs, as indicated by the marginal cost curve MCe. To maximize profit the group would reduce buying prices and the quantity of paddy purchases to the point where marginal costs, MCe, equal marginal revenues, which is equal to Pe.

Paddy purchases would fall from Qc to Q1 and the price received by the middle-level dealers would fall from Pmd to Px. The remaining competitive middlemen would simply transmit these lower prices to the producers. Therefore, oligopsony results in lower prices to the producers, and a lower level of paddy production.

Figure 2. Price Determination



De, Dmd, Dvd, Dp = demand curve
Sf, Smd, Svd, Sp = supply curve
MCe = marginal cost; ACe = average cost; MRe = marginal revenue

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GOVERNMENT INTERVENTION

State intervention in the foodgrain market in Nepal takes the forms of announcement of minimum support prices, procurement of foodgrain, restriction on exports, and supply of grain to vulnerable classes at below-market prices.

Announcement of a support price, a willingness of the government to buy all grain offered at the announced price, has been a part of HMG/N's policy since 1977/78. The predominant objective of the support price is to guarantee remunerative return over costs to farmers. However, this price has never been effective because it has been too far below the market price (APROSC, 1982a).

Furthermore, the prices are announced, not at the beginning of the crop year, but around the harvesting period, affecting farmer decision at the time of planting. For example, in 1982/83, the minimum support price for coarse paddy in Jhapa was Rs.178/quintal, while the market price was Rs.217.50/ quintal in the district and Rs.235.62/ quintal in markets across the border (APROSC, 1982a).

Even if market prices fall below the support price, the government's ability to guarantee the support price is questionable since the institutional infrastructure required to undertake procurement on a significant scale is lacking. The government has started considering proposals for alternative foodgrain procurement arrangements at the primary level, though no decision has yet been made in this regard.

In addition to setting support prices, HMG/N procures rice from the market through the Nepal Food Corporation (NFC). Though the NFC has been mandated to insure the effective implementation of HMG's food policies, NFC procurement activities seek to provide rice at subsidized prices in the foodgrain-deficit hill and mountain regions more than to provide remunerative prices to farmers.

There have been frequent changes in NFC's mode of rice procurement. Initially, all procurements consisted of levy rice collected from exporters. This method gained importance with the establishment of the seven Rice Exporting Companies (REC) in 1974. These quasi-government companies were established to aid the implementation of several price policy objectives, including the provision of reasonable prices to the farmer for his produce; the coordination between domestic requirements and exports; and the emphasis of primary procurements by village cooperatives (Sajhas). The REC's were dissolved in 1978/79 when the amount of levy rice started shrinking because of declining exports. Between 1979/80-1982/83, the NFC relied predominantly on open market procurements; 91 percent of NFC's procurement was from millers late in the post-harvest season. Procurement from farmers was negligible--in 1981/82 it amounted to only 1938.82 mt of paddy. Efforts to make the Sajha cooperatives a primary agent in procurement also proved unsuccessful. In 1978/79, there were 533 Sajhas in operation in Nepal. A study of 104 Sajhas by Nepal Rastra Bank revealed that only nine of them were involved in the procurement of paddy. The total amount of paddy procured was worth only Rs.346,000 (Mudbhary, 1983).

From 1983/84, the NFC has reverted to levy procurement. At present, all rice mills above two tons-per-hour capacity are required to sell 25 percent of their stock at levy prices to the NFC. The levy prices fixed for the 1983 harvest were Rs.341/quintal for coarse rice and Rs.350 quintal for fine rice, about 10 to 15 percent lower than prevailing market prices during January 1984.The NFC intends to procure 42,000 mt during 1983/84 in this way (Mudbhary, 1983).

The procurement activities of the NFC are guided by the need to distribute foodgrain in the food-deficit areas of the hills. NFC distribution programs have always carried a substantial element of subsidy.

Table 6. Average Subsidy per Metric Ton in NFC's Distribution Program

Year	Amount
1974/75	Rs 41
1975/76	Rs 306
1976/77	Rs 618
1977/78	Rs 986
1978/79	Rs 1479
1979/80	Rs 1828

Source: "Nepal: Foodgrain Marketing and Price Policy Study," APROSC, 1982.

The total subsidy received by the consumer is, however, higher as the NFC itself procures foodgrain at below-market prices. In spite of persistent increases in the level of subsidy, selling prices have remained constant.

NFC's distribution activities are based on district allocation quotas. The allocation of quotas are based on district food balance sheets prepared by FAMSD, the previous year's quota and sales, and the budgetary constraints of the NFC.

Average annual distribution by the NFC during 1976/77-1981/82 was approximately 42,233 mt. Of this, 55.7 percent of the grain was sold in the Kathmandu Valley, 34.3 percent in the hills, and 10 percent in the mountains.

In sum, public intervention in the foodgrain market is consumer-oriented and imposes a tax on producers in terms of reduced prices for their produce.

CONCLUSIONS AND POLICY IMPLICATIONS

The main findings of the preceding analysis can be summarized as follows:

1. Low incomes and the low level of integration between the hill regions and the Tarai have been the source of the imbalance between domestic consumption needs and export of foodgrains, especially rice.

2. Production levels of foodgrain are too low in relation to targeted levels of consumption. There is, therefore, a need to augment production levels in a relatively short time. This requires, among other things , a price inducement for the farmers to both produce more and market a larger part of their output. The price received by farmers for their produce is, therefore, a crucial variable that has to be maintained at a remunerative level.

3. The conflict between maintaining remunerative prices, which requires among other things a liberal export policy, and stabilizing domestic consumption levels, poses a serious problem. Consumption levels, especially in the hill and mountain regions, are seriously inadequate. Therefore, at least in the short run, stabilization of domestic consumption levels necessitates a restrictive export policy that regulates exports in close relation with domestic consumption needs. This implies an implicit tax on producers that goes to increase, or at least maintain the real income of consumers.

4. Restrictions on exports are very difficult to implement on the 1000 km long open border with India. The system of quantitative restrictions has little meaning as far as exports to India are concerned. Their only effect is to marginally increase the transaction cost involved in across-the-border trade. The actual level of exports appears to be greater than recorded licensed exports. Consequently, paddy prices in Nepal are determined by the paddy prices in neighboring markets in India.

5. The paddy market contains powerful oligopsony elements among the large-scale traders. The effect of these elements has been to reduce the level of prices received by the farmers. Market force cannot be depended on to handle foodgrain distribution in the national interest. This has led to the establishment of public agencies that intervene in the foodgrain market. Principal among these have been the now-defunct Rice Exporting Companies and the NFC, which is wholly consumer-oriented. The subsidy element in NFC foodgrain sales is substantial and expansion of NFC operations necessarily entails a heavier financial burden on the government. An important feature of the NFC's distribution is its heavy concentration in the Kathmandu Valley. This raises questions, justifiably, about the equity of the NFC's operations.

Several policy implications can be drawn from these conclusions:

1. Food policy options have to be sought in a broader context with the aim to exploit regional complementarities to national economic advantage. The present policy that emphasizes regional self-sufficiency may be appropriated only in the short-term. The potential for foodgrain production in the hill and mountain regions needs to be accurately

assessed on the basis of production increases that the terrain in the region can sustain and the relative economic costs. If the potential for foodgrain production increase is inadequate in relation to long-term consumption requirements, planning needs to focus on evolving a sustainable basis for exchange between the uplands and the Tarai. Evolution of such a basis hinges greatly on the development of a physical infrastructure linking the hill and mountain areas to the Tarai. However, developing an infrastructure, especially in the former, entails heavy costs and can only be achieved gradually. Thus, regional self-sufficiency may remain a valid short-term goal. The urgency of immediate needs creates a serious conflict between short and long-term policy goals.

2. The view that hill area development necessarily occurs at the expense of the Tarai can be misleading. Economic development of the hills would in fact ease the financial burden on the Tarai economy and subsequent low prices for produce. Growth in income levels in the hills will lead to corresponding growth in effective demand for foodgrain and thus help maintain remunerative prices essential to rapid growth in foodgrain production.

3. Measures to eliminate the monopoly elements in the foodgrain will enable farmers to get higher prices for their produce. Procurement and marketing by village cooperatives may substantially countervail the oligopsonistic power of the large-scale traders.

4. Since exports to countries other than India are subject to licensing procedures, the system of quantitative restriction on exports can potentially lead to a diversion from exports overseas to exports to India. If the other prices of rice were greater than the Indian prices, this would be a further loss for the producers. Consequently, a system of levy on exports irrespective of destination, in place of quantitative restrictions on exports, may be the optimal policy.

5. The Rice Exporting Companies have demonstrated that the government can intervene in the market in a fairly positive way. The accumulation of losses that led to the dissolution of these companies was more a result of inefficiencies in management than larger structural defects. Revival of such companies would reduce the oligopsonistic power of the big millers/traders and would thus make the market more competitive.

6. Expansion of the NFC's foodgrain distribution activities need to be more closely examined in light of HMG/N's budgetary constraints. For example, NFC's concentration on the Kathmandu Valley cannot be justified except perhaps on political grounds. NFC needs to confine its distribution program to special low-income target groups.

7. Frequent changes in NFC's policies have contributed to the instability of Tarai markets. Policy announcements regarding modes of procurement are not timely and this injects elements of uncertainty into the market. Instability encourages movement of grain to more stable markets across the border.

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