



**UNIVERSITI PUTRA MALAYSIA**

**AN ECONOMIC ANALYSIS OF MARKETABLE  
SURPLUS OF PADDY IN KATHMANDU DISTRICT**

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by

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## ABSTRACT

The primary objective of the study is to identify factors determining the marketable surplus of paddy for farmers in Kathmandu district. In addition, the study also examines the pattern of disposal of paddy among different categories of farmers.

Cross-sectional data gathered through personal interviews of 119 farmers were utilized in the analysis. A multiple linear regression model was used to ascertain the factors influencing the marketable surplus. The variables hypothesized to have a significant effect on the dependent variables comprised paddy production, average price, family size per adult unit, and income from off-farm, and other sources. Elasticities were computed to show the response of the independent variables to changes in the dependent variable. Lorenz Curve and Gini ratio were employed to determine the pattern and degree of inequality of the distribution of marketable surplus among the four size groups of farmers in the district.

Regression equation was estimated for the aggregate data as well as for each of two category levels. The category levels were based on the level of paddy production, those producing less than 60 muris fall into the first category, and those producing equal to or more than 60 muris into the second category.

The regression analysis indicated that paddy production and family size per adult unit were two significant variables



in determining the quantity marketed. Elasticity coefficients also showed that paddy production had a positive impact on the marketable surplus while family size had expected association with the dependent variable but with small coefficient. On the other hand, average price and income variables had no effect on the amount marketed, nor had they expected relationship with the dependent variable. The marketable surplus of paddy was unequally distributed among the farmers in the district. The analysis of Lorenz Curve and Gini ratio suggested that the larger the size of land holdings the more the quantity marketed.

From results of the analysis certain measures to boost the marketable surplus by increasing the level of production were recommended. These include increasing the effectiveness of extension services, using more land saving techniques of production, increasing the availability of credit and seeds of high yielding varieties. Population curbing measures could also help reduce the level of consumption by the farmers, thereby increasing the quantity marketed.

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## CHAPTER 1

### INTRODUCTION

The role of marketable surplus<sup>1</sup> defined as the volume of output disposed of from total production in the market, in the economic development of a country has generated considerable debate among development economists. However, many believe that marketable surplus occupies a crucial role in the economic development of country, since in an agricultural country it is the marketable surplus that can contribute to the process of economic development. The experience of several countries such as Russia, China, Japan, Taiwan, and South Korea has shown that a substantial increase in the marketable surplus is indeed necessary to foster economic development (Subra, 1963). Dubey (1959), for example, argues that there is no reason to suppose that it will be the marketed surplus of agriculture which plays the crucial role in the underdeveloped countries in setting the limits to the possible rate of industrialization. Two reasons are given. First is that since the disguised unemployed are mostly on farms, their transfer to industrial projects would result in higher per capita incomes for those remaining on farms because of a larger per capita share. However, the underfed farmer would not market this increase output. The second reason

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<sup>1</sup> Throughout this study, the term marketable surplus is interchangeably used with marketed surplus, although economists distinguish between them, the former being defined as total production less family requirement, and the latter as the amount actually sold in the market irrespective of family requirement. Marketed quantity or volume are also frequently used for marketable surplus.

is that efforts to increase production in agriculture would not solve this problem, as increased productivity might lead farmers to reduce the amount of their labor keeping their income, and consumption constant, and enjoying more leisure, thereby declining output and marketed volume. Behrman (1968) argues that if an increase in output induces consumption of manufactured goods due to the demonstration effect, marketed surplus will be increased in order to buy those goods. Such a situation initiates farmers to produce more and also to dispose more of it so as to meet increasing demand of finished goods, which, in turn, stimulates industrial development.

Development experience points to the importance of increasing agricultural productivity as a basis for rapid industrialisation, and the expansion of marketed surplus to enhance the process of development. A growing marketable surplus can contribute to capital formation in an underdeveloped country. Marketable surplus also has a vital role to play in meeting the demands of a growing population in urban areas as development and urbanization typically coincide. Furthermore, as developing countries are mostly agricultural, this sector is relied upon for exports needed to cover the costs of imported capital goods. The rate of growth of the industrial sector and of non-agricultural employment depends, to a large extent, on the availability of increased production of food grains and raw materials for the

urban industrial sector. If the quantity of food grains required to sustain a given increase in industrial employment is not provided, either industrial development will decrease, or inflationary tendencies will develop in the economy, eventually jeopardizing the process of economic development.

Marketable surplus occupies a significant role in the economic development of Nepal, since the problems for Nepal are similar to those outlined above. An increase in agricultural production, and thereby in marketable surplus is necessary to meet domestic demands as well as the need for export trade. The problem has become accentuated in recent years by pressures to keep pace with increasing population and to maintain the contribution of rice in export trade. Nepal, until recently a food surplus country, is heading towards a deficit situation, and unless immediate efforts are undertaken, the problem is certain to increase.

Since rice comprises such a major share of all agricultural produce, it is given emphasis in this study. The present study is carried out in one of the fertile rice growing districts, Katimandu, and it is hoped that empirical observations from the study will provide basic information for working out a realistic food policy for the country.

The significance of the marketable surplus to economic



development as discussed above requires an understanding of the nature of its response to changes in production and other factors. The availability of quantitative estimates of this response would enable better estimate of the supply of rice for the urban population and help determine an appropriate agricultural price policy.

The basic objectives of this study are:

Firstly, to identify factors determining the marketable surplus of paddy cultivating households. Secondly, to estimate the elasticity of marketable surplus for the short run. Thirdly, to examine the pattern of disposal of paddy on the basis of two size groups, and of the aggregate.

#### Nepal's Economy

Agriculture predominates in Nepal's economy providing livelihood for about 87 per cent (C.B. of Statistics, 1982). Its share in the economy amounts to over 65 per cent of the gross domestic product (C.B. of Statistics, 1982). Food crops alone are cultivated on about 92 per cent of the total arable land. Geographically, Nepal comprises three parallel regions that traverse from east to west. The Himalayan belt spreads over the north, a lower but mountainous area lies in the centre, and the fertile tarai stretches along the southern border. The centre part also consists of several fertile valleys namely, Kathmandu, Pokhara, Dang and Surkhet.

The principal agricultural crops produced in the country



are paddy, corn, wheat and jute, of which paddy commands a substantial share. Rice is the staple food of the majority of the people especially those living in the tarai and the mid-hills. Rice is also one of the major commodities exported from the country. The tarai produces about two-thirds of the total cereal production and provides surplus food grains chiefly, rice, for the deficit regions.

The valleys also produce a substantial portion of food grains. Dang and Surkhet valleys, in particular, supply food grains to the adjoining districts, however in Kathmandu and Pokhara valleys because of high density of population, a large volume of food grains is received from the tarai.

The climate is conducive to a multiple crop system. Paddy is cultivated in the monsoon season while other crops are planted in the dry season. In the eastern tarai, however, rice or jute is cultivated in the monsoon season. Kathmandu district as shown in Figure 1 is one of the three districts of the Kathmandu valley, the other two being, Bhaktapur and Lalitpur. The district, in which the capital city is located, is also adjoined by Makawanpur, Nuwakot and Dhading. Its population of 431,933 in 1979-80 constituted the largest in the country. The total area stretches over 54,500 hectares, of which the arable land covers 20,735 hectares. As indicated in the food balance sheet of the principal food grains of the country for 1970-80 (Table I), a net deficit of 38,000 metric tons of rice was





**Fig.1:** Map of Nepal showing Kathmandu District



TABLE I. BALANCE SHEET OF PRINCIPAL FOODGRAINS  
FOR 1979 - 1980

Qty: in '000 m. ton

Development Region	Rice			Maize			Wheat		
	Production	Requirement	Balance	Production	Requirement	Balance	Production	Requirement	Balance
Eastern	398	229	+169	107	141	-34	56	26	+30
Central	402	368	+ 34	126	237	-111	146	97	+49
Western	148	180	- 32	94	144	-50	69	46	+23
Far Western	108	184	- 76	143	150	- 7	76	73	+ 3
Total	1056	961	95	470	672	-202	347	242	+105
Kathmandu	19	57	- 38	13	36	- 23	14	20	-6

Source: Food Balance Sheet of the Kingdom of Nepal  
Food and Agriculture Marketing Services Department  
(1979 - 1980).

registered for the district. The productions of maize and wheat in that year were 13 and 14 thousand metric tons respectively, while maize was cultivated on 7,300 hectares, and wheat on 13,010 hectares. On the national level, the surplus stood at 95,000 metric tons in the case of rice, however, the total surplus including maize and wheat was 105,000 metric tons.

Rice is the major crop produced in the district during monsoon, however, the district is not an important source of marketed rice. Land is fertile, but high rates of tenancy characterize the district. Farmers are highly receptive to improved techniques of production and quick to adopt them. The output per hectare is one of the highest in the country. The size of land holdings and the total arable land are, however, smaller than in the tarai. And as a consequence of dense population, the quantity produced in the district cannot meet annual local requirements particularly those of Kathmandu city. Thus a large volume of food grains, normally, parboiled rice is brought from the tarai and sold at subsidized rate.

Nepal Food Corporation (NFC) sold 11,575; 18,231 and 18,391 metric tons of rice in the years of 1976/77, 1977/78 and 1978/79 respectively. These amounts also include rice sold in neighbouring districts. Because of early harvesting in the district relative to the tarai, the local supply, nevertheless, provides the bulk of the supply and influences the price level until supplies arrive from the tarai. And also because rice

produced in the district being of superior quality, farmers dispose of their produce at higher price and buy the tarai rice sold by NFC at lower rate for consumption. Marketed volume from Kathmandu district are, however, restricted since land holdings are small and a large proportion of farmers are at subsistence level.

## CHAPTER 2

### REVIEW OF LITERATURE

Increasing agricultural production and marketing larger quantities of output has been a major policy in developing countries as a result of exponential growth in the population. Consequently, the debate over the response of farmers to economic incentives has arisen considerably in these countries. Schultz (1965) is of the opinion that the rate at which farmers, in a traditional agricultural setting accept a new factor of production depends on its profit, and that the response is similar to the observed in modern agriculture. He rejects the view that, in poor countries, farmers are indifferent or respond perversely to changes in prices. However, he does admit that some institutional and cultural constraints may have some adverse effects on production. Raj Krishna (1963) in his study on Punjabi cotton suggests similar findings. Similarly, Baur and Yamey (1959) found a positive relationship between price and supply for the Nigerian cocoa. Behrman (1968) also found that farmers in underdeveloped countries responded substantially to changes in price. Behrman (1968) estimated the price elasticity of the marketed surplus for Thai rice and found it positive, because the estimates of the total production response are positive and no counteracting income effect on consumption is observed. His results further showed that there was a statistically significant positive short run price response in both total and marketed supplies of Thai rice. Toquero, et. al (1975), similarly,

indicated quite clearly that there was no evidence supporting a negative price response in the market supply for a given output as argued traditionally by Mathur and Ezekiel.

On the other hand, Askari and Cummings (1975) contend that the validity of the assumption that given land reform, availability of fertilizers, pesticides, and irrigation, farmers will in fact respond to economic incentives by producing and marketing larger quantities has been questioned by many observers. The objection has been made that while farmers may be responsive to price changes, their planting and marketing decisions are primarily governed by traditional behavior patterns, thereby making price response only secondary importance in explaining output variations. Similarly, Mathur and Ezekiel (1961), and Enke (1963) are of the opinion that the marketed surplus of subsistence farmers is inversely related to price. They argue that subsistence farmers may have fixed or relatively fixed monetary obligations and hence, only dispose of as much of their production as is necessary to obtain the desired money income. The subsistence farmer is most likely to be in debt because of social obligation or an unforeseen drought, and thus in order to meet commitments in such circumstances, the farmer needs to sell a portion of his produce. The result is that an increase in the price of product will be followed by the decrease in the quantity disposed of, since a smaller quantity marketed can meet his cash requirements. Olson (1960) and Krishnan (1965) have also suggested an inverse relationship

between the marketable volume of subsistence crop and price. They argue that an increase in price for a subsistence crop may increase the producer's real income sufficiently so that the income effect on his demand for consumption of the crop outweighs the price effects on production and consumption, and hence the marketed surplus may vary inversely with marketed price.

Most of the studies on supply response have focused on price response, testing the various alternative supply models or the marketable surplus hypothesis. Adequate attention has not been given to non price factors such as those due to cultural and institutional differences. Askari and Cummings (1976) suggest that factors such as whether farmers are risk takers, the role in production of the land tenancy structure, irrigation systems and the importance of chemical fertilisers should be taken into account. Other factors such as whether the crop is grown primarily for food or cash sale whether crop is an annual or a perennial can also have considerable influence on the supply function.

It is also generally argued that the size of family in a household has a significant effect on the marketable surplus as evidenced by the findings of Sharma, and Gupta (1970). Larger family size disposes of less amount of marketed surplus than smaller one, since the larger the family size, the higher will be the quantity consumed, and less will be available for

disposal. In other words an increase in the marketed surplus is likely to be siphoned off by an increase in the family size.

Many earlier studies have also indicated that there is a strong link between marketable surplus and output. They, further, suggest that one of their major findings is that the marketable surplus for rice increases more than proportionally to the increase in output and that the elasticity of marketable surplus with respect to output is very high relative to the partial and the total price elasticities. Such findings were reported by Bardhan (1970), Haessel (1975), and Chinn (1976) in their respective studies. Haessel (1975) argues that the elasticity of marketable surplus with respect to output is substantially greater than unity. From the policy standpoint this means that as output increases, farmers will retain a smaller percentage for consumption purposes and make a larger percentage available for off-farm consumption. Similarly, Chinn (1976) concludes that an exogeneous one per cent increase in output, say, through an increase in average yield due to the introduction of new high yielding rice varieties, would result in an increase in total marketed surplus by 1.06 per cent and a 0.31 per cent increase in on-farm consumption of rice. Bardhan's (1970) study in some North Indian villages revealed that the regression coefficient of the marketed proportion of production on production itself is significantly positive, i.e. the volume of marketed surplus is a quadratic function (with positive second derivative) of the average level of foodgrain

