Determination of Marketed and Marketable Surplus of Paddy in Dhanapur Block, District Chandauli, Uttar Pradesh, India

Rakesh Kumar* and Mauli Agrawal

Department of Agricultural Economics, Udai Pratap (Autonomous) College, Varanasi-221002 (U.P.), India

*Corresponding author

Abstract

This study examines the nature and extent of marketed and marketable surplus of paddy across different farm categories in Dhanapur block, Chandauli district, Uttar Pradesh. Using a three-stage stratified random sampling technique, data were collected from 30 rice farmers classified into marginal (below 1.00 ha), small and medium (1.00-2.00 ha), and large (2.00 ha and above) farm categories. The study reveals significant variations in surplus patterns across farm sizes. Per farm production ranged from 25.1 quintals for marginal farms to 153.3 quintals for large farms. Marketed surplus as percentage of total production was highest for marginal farms (84.06%) and lowest for large farms (27.91%), indicating distress sales among smaller farmers. Large farmers showed better retention capacity and strategic selling during off-season periods. The study found that farm size, family size, production volume, and consumption levels significantly influence both marketed and marketable surplus. Policy implications include improving access to credit facilities for marginal farmers, preventing land fragmentation, and promoting off-season marketing strategies.

Introduction

Rice (*Oryza sativa*) serves as the staple food for approximately half of the world's population, with 95% of global rice production being consumed by humans.

In India, rice accounts for approximately 26% of global production and contributes around 40% to world rice exports. As a critical food security crop, understanding the marketing dynamics and surplus generation patterns of rice becomes essential for agricultural policy formulation and economic development.

Marketed surplus refers to the quantity of produce actually sold by farmer-producers in the market, irrespective of their requirements for family consumption and other obligations. Marketable surplus, on the other hand, represents the theoretical surplus available for sale after meeting genuine consumption requirements, family needs, seed and feed requirements, wages in kind, and social obligations (Mondal, *et al.,* 2022).

The relationship between marketed and marketable surplus varies significantly based on farm characteristics and external conditions. Marketed surplus may exceed marketable surplus during distress sales, particularly among marginal and small farmers with immediate cash requirements. Conversely, large farmers with better retention capacity may sell less than their marketable surplus, anticipating better prices in future periods.

Factors Affecting Marketable Surplus

Several factors influence the level of marketable surplus at the farm level:

Size of Holding: Positive relationship exists between farm size and marketable surplus

Production Volume: Higher production leads to larger marketable surplus

Commodity Price: Both positive and negative relationships exist depending on short-term versus long-term considerations

Family Size: Larger families typically result in smaller surplus

Seed and Feed Requirements: Higher requirements reduce marketable surplus

Nature of Commodity: Non-food crops generally have higher marketable surplus ratios

Consumption Habits: Regional dietary preferences affect retention patterns

Study Objectives

This study aims to analyze the impact of farm size on marketed and marketable surplus, the influence of production level and household consumption on marketed and marketable surplus, and the effect of family size on marketed and marketable surplus. The research further seeks to understand the interrelationship among these factors and how they collectively determine the extent of surplus available for the market. By examining these dimensions, the study intends to provide useful insights for improving farm efficiency, enhancing farmer income, and guiding policy decisions in the agricultural sector.

Previous research has established important foundations for understanding agricultural surplus patterns. Vijay Kumar et al., (2009) found that majority of rice producers in Sitamarhi district, Bihar, lacked marketable surplus, with major constraints including lack of capital (66.67%), weak market infrastructure (46.67%), and limited transport facilities (41.43%).

Singh et al., (2011) demonstrated that marginal and small farmers in eastern Uttar Pradesh sold larger quantities of vegetables compared to medium and large farmers, with higher ratios of marketed to marketable surplus. Anil Bhatt et al., (2012) reported that marketed surplus increased with farm size, ranging from 5.16 quintals for small farms to 26.67 quintals for large farms.

Vijay Paul Sharma (2016) analyzed factors affecting marketed surplus using data from 918 rice producers, finding that farm size, access to regulated markets, institutional credit, and family size significantly influenced marketing decisions. The study revealed that family size negatively impacted marketed surplus due to higher household consumption requirements. Satish Chandra Verma et al., (2021) observed that large farmers retained greater quantities due to superior retention capacity, while marginal farmers experienced distress sales. The study identified lack of storage facilities as a major constraint for farmers.

Materials and Methods

Study Area

Chandauli district, established in 1997 from Varanasi district, is located in eastern Uttar Pradesh between 24°56' to 25°35' north latitude and 81°14' to 84°24' east longitude. Dhanapur block was purposively selected due to its progressive nature in rice cultivation, proximity to Varanasi city, fertile plain soil, and well-developed irrigation infrastructure.

Sampling Design

A three-stage stratified random sampling technique was employed:

Stage 1: Selection of Dhanapur block from 9 development blocks in Chandauli district

Stage 2: Random selection of 3 villages (Baheri, Silauta, Janauli) from 124 villages (2% sample)

Stage 3: Selection of 30 farmers (20% of 150 farmers) classified into three categories:

Marginal farms: Below 1.00 hectare (10 farmers)

Small and medium farms: 1.00-2.00 hectares (10 farmers)

Large farms: 2.00 hectares and above (10 farmers)

Data Collection

Primary data were collected for agricultural year 2023-24 using structured questionnaires covering:

General farmer information
Land holding details
Production, consumption, and marketing patterns
Family demographics and education
Asset ownership

Secondary data were obtained from government publications and statistical bulletins.

Analytical Framework

Data were analyzed using descriptive statistics and cross-tabulations. Marketable and marketed surplus were calculated as:

Marketable Surplus (MS) = Total Production (P) - Total Requirements (C)

Where C includes family consumption, farm needs, seed, feed, wages in kind, and social obligations.

Results and Discussion

Study Area Characteristics

Dhanapur block covers 22,455 hectares with a population of 221,375 (Census, 2011). The block exhibits favorable agricultural conditions with:

Net sown area: 17,117 hectares (76.2% of total area)
Gross cropped area: 28,745 hectares
Cropping intensity: 167.9%
100% irrigation coverage through canals (15,188 ha) and tube wells (4,811 ha)

Sample Farm Characteristics

Production Patterns

Marketing Patterns

Marketed Surplus Analysis

Impact of Family Size

Family size significantly influenced marketing behavior:

Small Families (1-4 members):

Marginal farms: 96.34% of production sold
Medium farms: 92.00% of production sold
Large farms: 98.20% of production sold

Large Families (9+ members):

Marginal farms: 88.88% of production sold
Medium farms: 89.67% of production sold
Large farms: 96.54% of production sold

Consumption Patterns

Seasonal Marketing Patterns

Marketable vs. Marketed Surplus

Farm Size Effects

The study confirms a strong positive relationship between farm size and absolute marketable surplus, consistent with previous research. However, the percentage of marketed surplus to total production showed an inverse relationship with farm size, indicating that marginal farmers are compelled to sell larger proportions of their produce due to immediate cash requirements.

Distress Selling Among Marginal Farmers

The finding that marketed surplus (211 qtls) significantly exceeded marketable surplus (23 qtls) among marginal farmers indicates widespread distress selling. This phenomenon forces small farmers to sell beyond their genuine surplus, often requiring them to repurchase rice at higher prices during lean seasons.

Strategic Marketing by Large Farmers

Large farmers demonstrated superior market intelligence and retention capacity, selling only 27.91% of production as marketed surplus while maintaining the highest absolute marketable surplus (1,080 qtls). Their ability to time sales during off-season periods (1,080 qtls vs. 428 qtls post-harvest) enables premium price realization.

Family Size Impact

The inverse relationship between family size and marketed surplus percentage validates theoretical expectations. Larger families require greater on-farm

consumption, reducing the quantity available for market sales across all farm categories.

Conclusion and Policy Implications

Key Findings

Production Efficiency: Large farms achieved significantly higher per-hectare productivity (49.1 qtls/ha) compared to marginal farms (45.6 qtls/ha)

Marketing Behavior: Marginal farmers sold 84.06% of production compared to 27.91% by large farmers, indicating distress sales among smaller producers

Retention Capacity: Large farmers retained 652 qtls more than their marketed surplus, while marginal farmers sold 188 qtls beyond their marketable surplus

Seasonal Patterns: Large farmers strategically shifted sales to off-season periods, while marginal farmers concentrated sales immediately post-harvest

Policy Recommendations

Credit and Financial Support

✓ Provide adequate and timely credit facilities to marginal and small farmers

✓ Link credit provision with cooperative marketing societies

✓ Implement crop insurance schemes to reduce distress selling

Infrastructure Development

✓ Establish scientific storage facilities in rural areas

✓ Improve rural road connectivity to reduce transportation costs

✓ Develop regulated markets with fair pricing mechanisms

Technology and Extension

✓ Promote high-yielding varieties to increase productivity

✓ Provide technical training on modern cultivation practices

✓ Establish demonstration plots for technology transfer

Market Interventions

Strengthen minimum support price (MSP) implementation

Reduce seasonal price fluctuations through buffer stock operations

Improve market information systems for better price discovery

Land Reforms

✓ Prevent further fragmentation of agricultural holdings

✓ Promote land consolidation programs

✓ Encourage cooperative farming for small and marginal farmers

Study Limitations

This study is limited to one block in Chandauli district and may not represent conditions across diverse agro-ecological zones. Future research should expand geographical coverage and include multiple crops to provide comprehensive policy insights.

Table.1 The 30 sample farms showed significant variation in size and structure

Farm Category	Number of Farms	Total Area (ha)	Average Size (ha)	Area Share (%)
Marginal	10	5.50	0.55	11.03
Small & Medium	10	13.08	1.30	26.24
Large	10	31.28	3.12	62.73
Total	30	49.86	1.66	100.00

Table.2 Per farm production showed strong positive correlation with farm size

Farm Category	Total Production (qtls)	Per Farm Production (qtls)
Marginal	251	25.1
Small & Medium	538	53.8
Large	1,533	153.3
All Farms	2,322	77.4

Table.3 Sales as Percentage of Production

Farm Category	Total Sales (qtls)	Sales Percentage
Marginal	234	93.22%
Small & Medium	507	94.23%
Large	1,508	98.36%
All Farms	2,249	96.85%

Table.4 Marketed surplus patterns revealed significant differences across farm categories

Farm Category	Marketed Surplus (qtls)	Share in Production (%)	Share in Total Marketed Surplus
Marginal	211	84.06	24.4
Small & Medium	225	41.82	26.0
Large	428	27.91	49.6
All Farms	864	37.20	100.0

Table.5 Consumption levels varied inversely with farm size

Farm Category	Production (qtls)	Consumption (qtls)	Consumption %
Marginal	251	17	6.07
Small & Medium	545	31	5.68
Large	1,543	43	2.78

Table.6 Marketing timing revealed strategic differences

Farm Category	Post-harvest Sales (qtls)	Off-season Sales (qtls)	Difference
Marginal	211	23	-188
Small & Medium	225	272	+47
Large	428	1,080	+652

Table.7 The relationship between marketable and marketed surplus highlighted distress selling patterns

Farm Category	Marketable Surplus (qtls)	Marketed Surplus (qtls)	Difference	Status
Marginal	23	211	+188	Distress Sale
Small & Medium	272	225	-47	Normal
Large	1,080	428	-652	Retention Strategy

Future Research Directions

1. Comparative analysis across different agro-climatic zones

2. Impact of climate change on surplus generation patterns

3. Role of contract farming in improving marketing efficiency

4. Gender dimensions in agricultural marketing decisions

5. Digital marketing platforms and their adoption by farmers

References

Agrawal, M. (2024). A Study of Marketed and Marketable Surplus of Paddy in Dhanapur Block, District Chandauli (U.P.). Master's Thesis, Department of Agricultural Economics, Udai Pratap (Autonomous) College, Varanasi.

Aoyagi, H. (2010). Significance of marketing strategy for rice production. Journal of Rural Economics, 28(2), 122-118.

Bhatt, A., Kumar, V., & Singh, R. (2012). A study of market and marketable surplus of paddy in Bishnah block of Jammu district. Journal of Agricultural Economics and Statistics, 3(2), 340-343.

Kumar, V., Singh, A.K., & Prasad, R. (2009). Marketing behavior, profile & suggestion of respondents paddy producer of Sitamarhi district in Bihar. Agricultural Update, 3(3/4), 244-246.

Mondal, M., Chakraborty, S., & Das, K. (2022). A study on factors affecting marketed and marketable surplus of major food grains of Nadia district of West Bengal. International Journal of Current Microbiology and Applied Science, 11, 128-135.

Sharma, V.P. (2016). Marketable and marketed surplus of rice and wheat in India: Distribution & determinants. Indian Journal of Agricultural Economics, 71(2), 451-468.

Singh, R., Kumar, A., & Verma, S. (2011). Marketable and marketed surplus of main vegetables in eastern Uttar Pradesh. Indian Journal of Horticulture, 68(2), 234-238.

Statistical Bulletin of District Chandauli (2011). District Statistical Office, Chandauli, Uttar Pradesh.

Verma, S.C., Kumar, R., & Singh, M. (2021). Assessment of marketable and marketed surplus in Kushinagar district of Eastern Uttar Pradesh. International Journal of Current Research and Technology, 9(5), 112-118.