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Determination of Domestic Procurement  
and Issue Prices and Implications of Intervention  
in Foodgrain Marketing

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## 1. INTRODUCTION

The question of price determination by a government arises only when public policy decisions are made to intervene in the market in order to achieve results which, in the belief of the government, would not be generated by the operation of a free market. Desirability of these "results" emanates from policy objectives which are often more implicit and diverse than explicitly mentioned in public documents and statements. Yet, the answer to such a basic question as whether public intervention would actually produce a more efficient outcome than private trade would critically depend on clear cut definitions and a positive measurement of policy objectives. Public intervention encompasses a wide range of options. Intervention could range from simple controlling of the rules of private trade to complete monopoly of actual marketing by a government. These options provide a scope for selecting the most efficient mechanism for intervention. When a mechanism of intervention involving direct public marketing is adopted, the whole structure of domestic marketing and the process of price formation may be affected in a radical manner. The principles guiding the setting of administered prices, volumes of purchase and sales, and the nature of operating rules - all assume significant roles in influencing the final outcome of policies. These principles bear their implications for seasonal and spatial price spreads, budgeting costs of government, participation of private trade in markets and transmission of price signals to producers and consumers in the economy.

This paper is addressed to issues arising from public intervention in domestic marketing of agricultural products - particularly foodgrains. Principles for determining administered prices (i.e. procurement and issue prices) are examined with reference to their theoretical bases as well as empirical applications. Then the interface between public and private marketing structures and conduct are analyzed with attempts at indicating the direction of net effects of specific public intervention mechanisms on price formation (i.e. consumer-producer, seasonal and regional differences on prices) and producers' incentives and consumers' welfare. Most arguments in the paper are based on empirical case studies on countries in Asia and Africa. Because of this empirical orientation, more attention is devoted to operationally relevant statements and less emphasis is placed on elaborating the underlying conceptual outlines.

## 2. PRINCIPLES FOR FIXING ADMINISTERED PRICES

There are two broad types of administered prices: procurement price - relevant to producers, and issue price - relevant to consumers. These prices are generally evaluated once a year in order to make changes if necessary, at the time of preparation of government budget. Principles that provide guidance to policymakers in fixing administered prices are presented in this section.

### A. PROCUREMENT PRICE

Principles for guiding determination of procurement prices have to relate closely with policy objectives and constraints. Principles that are generally followed or ought to provide the bases for fixing procurement prices are examined here.

(1.) World Price

In any price determination, it is hard to avoid the basic question of what the optimal price of a commodity is, at least at an intellectual level. Given necessary information on policy objectives, instruments and constraints, comprehensive modelling exercises can generate optimal structure of relative prices. Assuming that free trade is operative in both domestic and external markets and that maximization of production of total goods and services at minimum resource cost is the only objective of a nation, then world prices for tradeables (exportable and importable) would represent as good a set of optimal prices as could be obtained from comprehensive modelling estimates. In other words, if efficiency in production is the only goal, world price provides the appropriate measure of opportunity cost of resources used in production of a commodity and therefore is also its optimal price from a social point of view. If the domestic price is lower than the world price then the nation will gain by raising the domestic price and selling the excess supply in the world market. If the domestic price is higher than the world price, the country can gain by import which will lower domestic price and production. The difference of domestic from world prices as a measure of price disincentives or price distortions in agricultural prices in developing countries has been extensively cited in price policy literature [2, 3, 17, 46].

If the divergence of domestic price from world price is the test criterion, hardly any developing country is guided by world prices most of the time, in its price policies. However, a careful examination of this deviation would point out that the exchange rate at which

world price is converted to domestic currency, explains the largest part of the deviations of domestic from world prices. This is particularly true in cases of African countries. At the official exchange rate the difference between domestic and world prices of foodgrains are smaller than that at the shadow exchange rate. However, in certain years the gap between world and domestic prices could be extremely large even at the official exchange rate. In 1974-75, foodgrain prices in many developing countries were maintained at about 50 to 70 percent of the level of world prices even at the official exchange rate [13, 53].

The fact that developing countries pursue multiple policy objectives, (e.g. growth, equity stability and self sufficiency) provides the most important explanation for such countries not equating domestic with world prices.

A logical solution often suggested to overcome the conflict between consideration for the consumer and the optimal incentive prices (at world price levels) for producers, is what we call multiple pricing policies or targeting of subsidized food distribution. The main principle of this policy is to make a distinction between consumers who can pay high prices and those who cannot and then making the policy such that the rich pay full incentive price and the poor pay at a lower subsidized price. South-Asian countries (India, Bangladesh, Sri Lanka, and Pakistan) are well known for their dual market policies (free market and rationing) in foodgrains [13, 24, 19, 31]. But none of these countries can convincingly claim to have allowed their free market prices to equate to world levels. Besides political considerations the administrative task of identifying the

target groups and reaching them effectively has most often been found to be a formidable problem in countries with widespread poverty [10]. The upshot of all these effects is that policymakers cannot ignore market prices and their effect on the bulk of the population, who are not that rich by any standard, but are also not included in the target groups. Thus south-Asian countries, in spite of a rationing system, have always attempted to maintain a ceiling price in the open market.

The second problem that tends to influence developing countries to insulate their domestic from international market is the high degree of instability in world prices, as discussed in a separate paper. On top of this fluctuation in world prices, the fluctuation of exchange rate must be added to assess the total extent of instability expected under a free trade regime. Few developing countries could possibly afford to import such high world price instability into their domestic market, particularly in foodgrains. It is however possible, and often suggested as a solution, that a country maintaining control over foodgrain trade, could use a trend value of world price (rather than actual price) for the purpose of fixing domestic price in any particular year. Actual world price could be much higher or lower than the trend. Therefore, provision of stabilization fund is generally required to be an adjunct in order for such policies to be operationally feasible. The stabilization fund will give out money in years when actual prices turn out to be higher than trend value, and replenish the fund when the actual price falls below the trend price. (Note that this rule is the reverse of the case of stabilization for exports.) Empirical evidence of operation of such policies in foodgrain trade of developing countries are rare. But such a principle

is often employed to stabilize prices of nonfoodgrain export crops in developing countries. The experience of such operation in the case of cotton in Sudan indicates that the management of the stabilization fund is quite complicated and has been sustained with an added cost equivalent to an implicit tax on producers of about 5 percent [28]. Experience with jute price stabilization in Bangladesh is almost similar.

Besides the two basic problems mentioned above, there are a few measurement problems that make the practice of setting domestic price on a par with world price very difficult. These are not unsurmountable problems but the extent of arbitrariness involved in overcoming these problems tends to diffuse the degree of optimality in the determination of prices.

First, in order to estimate border prices at the producers' or consumers' level, the standard price quoted on the world market has generally to be adjusted for domestic marketing costs as well as the cost of shipping (insurance and freight) to or from the border of a country. These marketing costs are highly variable across regions and the use of an average estimate without any knowledge of the distribution does not guarantee that the border price is in fact a really optimal one. There does not appear to be any other alternative than competitive trade which can guarantee such universal optimality. Perhaps, this is the reason why most people tend to consider the principle of price fixation based on world prices as synonymous to an advocacy of free trade.

Secondly, the gap between import parity and export parity prices of a commodity could be extremely large. Countries on the threshold

of self sufficiency (importing in one but exporting in another year) thus would face a dilemma of which pricing principle to follow. Export parity and import parity prices in maize in most African countries differ by as much as 40 to 125 percent [8, 20]. Philippines was alleged to be paying a rice price to its farmers at 20 to 25 percent lower than the world price on an import parity basis. But as soon as the Philippines started to export rice, they found that they could not do so without a large subsidy; the subsidy on rice export was reported to be P90 million (P8 = US \$1) between 1977 and 1979 [53]. Even Bangladesh, when it faced a temporary surplus of rice in 1981 and attempted to export 20,000 tons of rice to Guinea, found the price to be only about 70 to 75 percent of the regular import price of rice coming into Bangladesh. The principal cause for the wide gap in the export and import parity prices is the quality factor. A dramatic example is the case of white maize in Africa and yellow maize in the world market. Besides, the quality factor, costs related to market information, transactions, and internal transportation could be different for import and export.

Thirdly, it is crucial that an exchange rate reflecting the real value of foreign currency is adopted in comparison of domestic with world prices. This shadow price of foreign exchange is often arbitrarily determined because of statistical problems. Most developing countries fix their exchange rates by public order rather than allowing it to be determined freely by market forces.<sup>1/</sup> In such a system it is important that the rate is periodically evaluated so

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<sup>1/</sup> In reality there are multiple fixed exchange rates applicable for multiple purposes in most economies. All these multiple rates can generally be averaged into an effective fixed rate, using respective weights.

that it does not lag far behind the changes in domestic prices relative to world prices. This is considered to be the least that should be reflected in any proxy of the shadow exchange rate used for agricultural pricing policy.

Finally, the comparison of domestic with world prices should be based on prices net of taxes and subsidies. The treatment of subsidy in estimating effective protection in agriculture has been very crude and mostly neglected, mainly because of statistical problems [3, 17]. It is known that developing countries do have a tendency of depending more on subsidy than output prices in influencing the expansion of modern inputs in agriculture. The incidence of subsidy on fertilizer, irrigation, seeds, and plant protection measures is quite high. A number of problems complicate any attempt to consider subsidy in the effective comparison between domestic and world prices. First data on crop by crop use of a subsidy is almost unavailable in most countries. Total subsidy cost is not that relevant for individual crop pricing. Secondly, even if the total subsidy used for a crop is available, should one divide such a subsidy by total production of the crop or by the marginal production that was dependent on the use of this subsidy? In subsistence agriculture the difference could be enormous. Using the argument based on the coefficient estimated through the former procedure, most analyses wrongly dismiss the importance of subsidy in making an effective comparison between domestic and world prices.

## (2.) Cost of Production

That farmers ought to receive a fair return on their outlay or cost of producing a product, is a popular principle guiding the price

fixation of agricultural products in many developed and developing countries. Generally, the average cost of producing a unit of output is used as a criterion or reference point in fixing support prices under this principle. This principle has however been questioned on a number of theoretical grounds. First, it has been pointed out that the cost of specialized resources is demand-determined, and therefore, not independent of product price. Accommodation of this cost in the fixation of price would involve circularity. Every time the product price rises, the cost of these resources would rise and the administered price would have to be raised. This argument is exactly the same as questioning the basis of inclusion of "rent" in the cost of production. Second, it has been argued that in the presence of uncertainty the cost that determines producer decisions is subjective opportunity cost that cannot be measured objectively. Third, the variance of cost across farmer groups and regions is very high; therefore the choice of groups and regions whose cost is fully covered by the administered price would be arbitrary [30, 41]. Moreover the production conditions in agriculture, as dictated by factor and product market imperfections, make the cost estimates deviate more widely from their true opportunity costs than would be expected in case of industrial production. Fixing prices on the basis of cost of production is, thus, less likely to approach optimality in agriculture than in industry.

The arguments against the cost of production as a principle for fixing prices are no doubt quite substantive. But the strongest point in favor of the principle of cost of production is that it provides a basis for dialogues between groups representing producers and other

interests involved in the political economy of price fixing. When urban and industrial groups exert pressure for lower farm prices, directly or indirectly, the farm lobby or Ministry of Agriculture (in the absence of an organized farm lobby) confront the pressure with logic provided in the cost of production estimates. The logic concerns the fairness of a price that provides a certain rate of profit over the cost of production. This profit may be compared with normal rates in other alternatives. Sometimes relative changes in cost of production and product prices over time are presented as arguments for changing administered prices.

Some of the problems with the cost of production principle mentioned earlier have perplexed professional economists working with governments in developing countries. Various solutions have also been attempted in order to minimize the disoptimality associated with these problems. The opportunity cost of family labor, valuation of such labor at market prices, the measurement of rent and whether such rent should be included in the cost of production - are questions which prompted estimation of cost of production in a number of alternative forms. Although these alternatives often help in clarifying the importance of certain types of costs (e.g. cash cost vs. imputed cost) in farmers decision processes, these estimates do not provide a decision rule by which one alternative could be considered more optimal than any other. Therefore, the basic proposition that the cost of production criterion does not lead to a socially optimal pricing decision still remains valid. The statistics on cost of production and procurement prices for foodgrains in India for the period 1955 - 1980 indicate that despite the intention, cost of production was perhaps

not a rigid guide for procurement price. For the period from 1955 through 1965, procurement price of foodgrains (wheat) was generally lower than the average cost of production by about 20-30 percent. However, for the period from 1965 through 1980, the procurement price was about 20 to 50 percent higher than the average cost of production [31]. This divergence between procurement price and cost of production over time has resulted more from technological influence than by an abrupt rise in procurement prices during the period of the green revolution. New technology in wheat appears to have reduced average cost of production. But the procurement price has not moved in harmony with the average cost of production per unit of output.

The problem of a large variance in the cost of production estimate can be solved by enlarging sample size and picking up the average cost from distribution that would cover the bulk of the production; say 60 to 70 percent. This practice would be comparable to what is known as "bulk line costing" in business management.

It is perhaps relevant to note that the cost principle has been accepted recently in the United States Food and Agriculture Act of 1977, as an alternative to the parity principle [30].

### (3.) Relative Prices of All Agricultural Products

Fixing support prices for an individual crop without any coordination with prices of other agricultural products is a common practice in developing countries. This practice gives rise to a number of problems resulting in wasteful resource allocations. First, when interproduct price relatives are changed by changing the support price of one product, farmers switch resources between products (e.g. between rice and jute, wheat and pulses, pulses and oilseeds, rice and

wheat, and foodgrains and cash crops) in response to wrong price signals, in the sense that the process generates excess demand and excess supply in different product markets. Second the terms of trade between agricultural and nonagricultural products is important for intersectoral resource movement [36]. The aggregate price index for agriculture is defined by the price of individual agricultural products and their respective shares in total agricultural production. If fixing prices of individual crops one by one leads to a consistent downward pressure on the aggregate agricultural price index, the terms of trade obviously move against agriculture and in favor of the nonagricultural sector. These two types of problems resulting from the practice of administered pricing deserve special attention while formulating policies.

The principles of cost of production and world prices as discussed earlier can be modified to guide fixation of relative prices of all crops in a consistent manner. Thus, equalizing domestic price ratios among crops with ratios in the international market is one way to ensure an optimal relative price structure.<sup>1/</sup> However, this principle creates a number of policy dilemmas in real world applications. For example, many African and Asian countries impose explicit and implicit taxes on their agricultural exports. This tends to make the domestic price ratios between export crops and foodgrains smaller than the price ratio in the world market. To equalize the domestic price ratio with the world market, policy makers can withdraw taxes on

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<sup>1/</sup> If the world market for a product is such that a country's action could influence world price, the price of that product should be considered at the margin (i.e. after the price change in the world market) in calculating ratios.

export crops or reduce domestic prices of foodgrains. Unfortunately, most countries tend to select the latter option. This, of course, implies a decline in the terms of trade of agriculture vis-a-vis nonagriculture.

Thus, we see that unless the principle is applied cautiously it may ensure a desirable relative price structure, but only at the cost of agricultural terms of trade.

The second principle of setting prices that may ensure an optimal structure of relative prices in agriculture is derived from the theoretical proposition of equating price-marginal cost ratios across commodities in order to maximize profit. According to this rule, the prices of two or more commodities should be set in the same relative order as is indicated by their relative marginal cost of production. Thus, the price of jute in Bangladesh has often been sought to be fixed at twice the price of paddy, because the cost of production of jute has been judged to be twice that of paddy [44]. In practice, this static principle also has its full share of pitfalls. It is compatible only with the situation of a closed economy. Moreover, when technological change brings down the cost of production of a commodity, its price may not be brought down by the full extent of reduction in cost; such a step may not also be desirable for growth in production through technological progress.

Ideally, the consistent set of relative prices can be determined by the solution of a farm sector model, appropriately specified for a given economy (see Parikh and Raza 1981). Such ideal theoretical solutions however have limited practicability in the context of most developing countries, mainly because of institutional underdevelopment and lack of professional support in the process of policy formulation.

(4.) Empirical Experience: A Multi-Principle Approach

Case studies as well as close field observations on price policies in countries of Asia and Africa do not indicate that any country can or does follow one single criterion for fixing agricultural prices by a government. The Indian Agricultural Prices Commission develops its recommendations in accordance with its terms of reference, stipulating multiple criteria [52]. The Sudanese government involving the Ministries of Agriculture, Finance, and Commerce determine administered prices of agricultural products following the principles of cost of production, world prices, and domestic free market prices [50]. Indonesia, Pakistan, Bangladesh, Philippines, Kenya, Malawi, Tanzania and quite a number of other countries - as examined by IFPRI researchers - do appear to adopt more than one criterion in determining administered prices. When there are more than one policy objective and constraint, a single formula is not likely to be sufficient for decisions that satisfy all the objectives and constraints. Therefore, it is not surprising that multiple criteria are employed in determining the levels of administered prices in most countries. One cannot however avoid wondering how the conflicting objectives and divergent decision rules emanating from multiple criteria are reconciled in arriving at a final decision? Most countries do not approach this problem in terms of a consistent framework for the purpose. The process is essentially an iterative one in which debate along one line is countered by another and the final decision is arrived at through consensus. Absolute "optimality" is thus an exception and "relative optimality" is the rule in the real world. The degree of optimality in price fixation that can be achieved in such a process of decision

making however depends very much on the extent of objective information that feeds the process of policy debate.

## B. PRINCIPLES FOR ISSUE PRICES

Literature on administered pricing is dominated by discussion on principles for procurement or farm level prices and less so on issue prices. The political undertone, particularly the short run concern for consumption, dominates the stage that sets the issue price. Considerations for farm level incentives and hence the relatively long run concern for growth in production underlie the principles of procurement price. This difference concerning the two types of administered prices may perhaps introduce a greater degree of arbitrariness in fixing issue prices than procurement prices.

The most important principle that shapes up the level of issue price in most countries with subsidized food distribution systems is the wage-price compatibility. The wage income of industrial workers and salary income of low level government employees are considered for this purpose. This income is compared with a typical consumption requirement of a standard family - say with 5 or 6 members. The price of foodgrain that is considered to be most consistent with the income and expenditure requirement is judged to be the appropriate issue price under such a principle. Wage reports prepared by the wage commissions or public service commissions in any South Asian countries invariably advance arguments relating the wage income and prices of foodgrains [29]. Prices of publicly distributed foodgrains are considered as an insurance against a deteriorating real wage or salary income under an inflationary situation. Subsidized foodgrains are

often treated as a part of real income support. Issue prices have consequently lagged behind the market prices of foodgrains [13, 24, 31].

Consideration of budgetary resources as a principle for determining issue price, generally takes place when annual budgets are finalized. A provision of subsidy must be accommodated in the budget. The demand for subsidy is considered along with the competing demands for all other public expenditures. In this process the issue price is generally readjusted every year reflecting budget constraints as well as political weights favoring or disfavoring food subsidy.

Perhaps, the interrelationships between issue price and free market price are most consequential in terms of certain economic outcomes, rarely appreciated in policy making circles as an effective policy instrument. If the difference between issue price and free market price of a commodity diminishes, the demand for the product shifts from publicly operated shops to open markets, the open market price tends to go up. Similarly, if the open market price goes up without any change in the issue price, the demand tends to shift from the open market to public shops; the actual shift, of course, depends on regulatory measures limiting consumers' access to public facilities. These relationships have been the basis of some recent changes brought about in the public food distribution system in Bangladesh. The dependence on rationing has been successfully reduced in Bangladesh by raising the issue price and indirectly influencing the market price so that the gap between the two prices is narrowed. It would have been politically difficult to achieve the same objective by cutting down certain categories of rationing or the ration quota.

Even though a policy making mechanism is extremely efficient in fixing a conclusively optimal price for an agricultural product, the actual outcome however will primarily depend on the nature of the domestic marketing system including public marketing and regulatory rules. Some implications of administered pricing in the context of various types of private and public marketing structures are therefore examined in the next section of this paper.

### 3. IMPLICATIONS OF PUBLIC INTERVENTION IN DOMESTIC MARKETING

An examination of domestic marketing structure and conduct in the context of an interaction between public and private marketing is presented in this section.

#### A. CONSTELLATION OF PRICES

Discussion on principles for determining administered prices, have proceeded so far without clarifying the interrelationships among a large variety of prices quoted in various points of the marketing channel. In the case of competitive private trade, the prices at the producers' level (farmgate and primary market), secondary level (wholesale), and tertiary level (retail and export markets), are uniquely interrelated by the cost of marketing (including traders' profit) from one point to the next in the marketing channel. In a mixed system (i.e. when public and private trade operate side by side) administered prices constitute additional sets and these prices may not interrelate in any unique fashion. The administered price at the farm level, generally called procurement prices, may have different meanings depending on the marketing rules which set the conditions of the procurement. Thus the levy price is different from the support

price (or floor price) even though both are procurement prices. Similarly, administered issue prices for rationing and fair price shops (as in South Asian countries) are substantively different from controlled market prices (fixed or maximum ceiling prices at retail and mill levels) as practiced widely in African countries.

Constellations of prices and marketing structure have to be kept under close scrutiny while evaluating price policies of an economy. For example, the estimates of prices received by farmers for a product could vary widely depending on whether the market price or procurement price or the weighted average of market and procurement prices (the respective shares of sales to markets and to government being weights) are adopted for estimation [22]. A failure to take into account these structural details of markets and prices could lead to erroneous policy conclusions.

Concerns for consumer welfare, price stability, incentives for accelerated growth and self-sufficiency, and above all a sense of security from food shortage and resulting political instability have manifested in various forms of intervention in marketing and pricing. It is, of course, true that political considerations have often reinforced economic reasoning for public intervention. For example, in a number of developing countries, public intervention in marketing originated from the anxiety of governments to extricate trade from the clutches of particular ethnic groups not considered to be a part of the mainstream nationals [18].

The mechanism of intervention varies from country to country. Generally, direct marketing through public parastatals assisted by a plethora of regulatory measures constitutes the basic pattern.

In the remaining part of this section of the paper, some important implications of public intervention in marketing are examined in the context of Asian and African experiences.

#### B. PUBLIC PROCUREMENT AND SPATIAL PRICES

Public procurement of foodgrains is generally undertaken to provide price support at the harvest season. However, there are instances where public procurement has been undertaken primarily for the public distribution system as well as public stock build up. The two objectives are not necessarily inconsistent. It is the level of procurement price and method of procurement that distinguishes one objective from the other. Pan territorial pricing or one-price throughout a country is a common practice in fixing procurement prices in developing countries. Administrative difficulties in operating with more than one procurement price are perhaps the main reason for pan territorial pricing rather than any conscious preference for uniform prices. If private trade is also operative and producers have full freedom to sell to the highest bidders, then the quantity that a government parastatal can purchase from the market would depend on the procurement price relative to the market price. Procurement prices can not be set higher than the market price everywhere; that would eliminate private trade entirely if budgetary and other resources are not a constraint. Even if the procurement price is a little lower than average market price, the quantity of procurement could be substantial. Producers and traders who are located in remote areas from the main consuming centers will find the procurement price more profitable. Similarly, producers and traders located nearer to the main markets may find the market price more profitable than the procurement

price. Under this situation, the public procurement will be limited to outlying production centers where poor infrastructural conditions entail a lower than average market price. The producers in such areas will find procurement an attractive source of higher incentives. Any subsidy to producers through such a procurement mechanism would be tantamount to subsidizing farm producers for their poorer infrastructures. This model of public procurement tends to reduce the interregional price spreads; the higher the procurement price relative to the market, the lower the interregional price gap. But a higher procurement price also implies an increasing substitution of public for private trade; private trade working in remote areas no longer finds it profitable (i.e. paying the procurement price, transportation costs and making a profit) and leaves such areas for public agencies to cover. Current procurement practices in India, Bangladesh, Pakistan, Indonesia and the Philippines represent the examples of this model. In most of these countries public procurement has covered almost 30 to 50 percent of marketed foodgrain. Indonesia is particularly known for being successful in reducing the interregional price spread (measured as an index of the highest to lowest price) from 150 in the mid-fifties to about 115 in the mid-seventies [38].

When private trade is banned through legalization of public monopoly, the result of procurement depends very much on the setting of a price, budgetary resources and logistical capability of the government. Empirically, few governments with a mixed economy can muster adequate resources, - financial, administrative, and logistical - to conduct a monopoly of public marketing in foodgrain without causing an extremely severe disincentive to producers. First, a limited budgetary resource can not accommodate a relatively high procurement price.

A concern for incentives may however prompt a recourse to deficit financing to sustain a desirable level of procurement price. But such measures invariably lead to inflationary pressure implying a decline in real price for procurement even though the nominal price level is sustained. Second, as the government expands its marketing logistics (transport, purchase centers, storage facilities, etc.) from remote to remoter areas in order to cover most farmers, the cost of marketing increases rather dramatically. This is particularly true in the case of countries with poor infrastructure. Thus a study on Malawi indicates that, with the increase in the number of purchasing centers in small scale production areas, the cost of procurement per unit of marketing went up at about twice the rate of inflation during the seventies [9, 33]. Similar evidence of increasing marketing costs are found to be true also in cases of Kenya and Tanzania [6, 12]. A large share of this increase in costs is ultimately shifted down to the producer through a lower procurement price. Third, when farmers do not have any other option than to sell to designated public purchasing centers, the procedure imposes additional transaction costs on sellers. The officers in charge of purchasing centers are vested with tremendous power to accept or reject a consignment on the grounds of quality or any other pretext. This power can easily be converted to pecuniary benefits by mutual arrangements between farmers and purchasing officers. The end result is an effective procurement price for farmers which is lower than the declared one.

Finally, a parallel or black market is bound to coexist with public monopoly under a real world situation of financial and administrative constraints. It is not uncommon to have prices in a parallel market which are two to three times higher than the publicly

fixed price [6]. In one sense, the parallel market is a natural consequence of unrealistic public monopoly; it provides an alternative market access to both producers and consumers. But it can not be considered to have an equivalent impact of a free market because of the risk associated with the illegal nature of exchange in the parallel market.

Compulsory procurement (also called levy) is a special mechanism by which large farmers are legally obligated to sell a part of their produce to the government at a lower than market price. This instrument was particularly used in India, Bangladesh and Pakistan, mainly for the purpose of feeding the public distribution system, during the sixties when the food shortage in South Asia was more critical than at present. The practice was criticized by some as an indirect taxation on farmers [49], while powerful arguments were presented by others disproving this position [22, 36]. Past work by Mellor and Dantwalla and recent empirical work by Hayami and Subba Rao has convincingly proved that the levy does not impose any disincentive effect on producers under a special condition [27]. If the procured foodgrains are distributed through the subsidy system to the poorer section of the population, then the weighted average price received by the farmers would be at least equal or higher than the price that would prevail without a levy. This is because the poor do have a demand for foodgrains with income elasticity higher than the price response (supply elasticity) in production. Farmers get a lower price for the levy quantity but at the same time receive a higher price in the free market for the remaining sales. Nevertheless, compulsory procurement as a practice is gradually declining in application.

Movement restriction has perhaps a much wider implication for prices than levy. When movement of a commodity between deficit and surplus regions is prohibited, the price in the deficit area is expected to go up while the price in the surplus area is likely to fall. The impact of movement restriction thus bears the potential implications for widening the gap between interregional prices. Empirical evidence substantiates this point rather strongly. [30, 40, 47]. Besides this effect on interregional prices, movement restriction produces a few other distortions in the economy.

The effect on interregional prices arising from movement restriction shifts the incentive structure against producers and in favor of consumers in surplus regions and in the opposite pattern in deficit regions. Generally the scope of increased production is larger in surplus than deficit areas. Similarly, the level of un- and underemployment is likely to be larger in deficit than surplus areas. The effect of movement restriction, following from this logic, may thus result in a net fall in production as well as a loss in consumers' welfare in rural areas. And, of course, the principal motivation for movement restriction lies in inter-regional (including rural urban) income distribution.

The second distortion that is caused by movement restriction is the result of corrupt practices and the potential of interregional smuggling becoming rampant in the system. A marketing study of maize in Kenya brings out some interesting estimates of social costs of these distortions. Besides the transaction costs, imposed directly on traders, of an amount equivalent to about 7 percent of price, the prohibition induces inefficient use of the existing transportation system [47].

Traders attempt to move goods in small scale vehicles (buses and matatas) rather than large scale and cheaper means of transportation (e.g. trucks) for the sake of avoiding detection by the police.

### C. PUBLIC MARKETING AND SEASONAL PRICES

There are two types of seasonal fluctuations in prices which public policies attempt to grapple with. Intra-year seasonal fluctuation, popularly known as lean and harvest season price difference, is somewhat different from inter-year variance in average prices. Some aspects of seasonality in prices of the former type will be examined here.

Agricultural production is generally seasonal. Prices at harvest season are lower than in lean seasons. Traders normally buy at harvest season, store the product for some time before selling at the lean season. To be able to do this, harvest and lean season price differences must cover traders' cost of storage as well as a normal rate of profit. The storage cost includes not only the cost of physical storage but also the opportunity cost of capital (interest cost) and an allowance for any loss of weight of the commodity while in storage. However, buying now in order to sell in the future involves a speculation about the price in the future. This uncertainty implies that traders may take an above normal profit in some years and a loss in others but on an average they must make a normal profit to remain in trade. Indeed, it is the occasions of above normal profit that earn the reputation of "greedy profiteers" for traders. When the government enters marketing, the simple mode of private trade as illustrated above, may be affected in a number of ways. The effect on seasonal pattern of prices will depend on two factors: (a) the change

in private trade in response to public marketing and (b) the efficiency of government in the management of trade. If the government purchase during harvest season and distribution, particularly during the lean season, is carried out in a manner that consistently reduces the gap between lean and harvest season prices beyond a limit which no longer accommodates any profit for private trade, then public trade would increasingly substitute for private trade in buying at harvest and selling in the lean season. The timing of market intervention, quantities to be procured and released, and the prices of procurement and sale - all have to be planned professionally and implemented very efficiently in order to maintain a desirable and stable pattern of seasonal prices; (a desirable seasonal pattern may be defined as the one which covers a full cost of transference from one season to the other or the one which arbitrarily sets a shorter price spread between seasons on distributive grounds). Case studies of Indonesia and Bangladesh provide some interesting evidence in support of some of the propositions elucidated above. The Bangladesh case shows that the domestic procurement of foodgrain was insignificant in the sixties. Public distribution through rationing at a modest scale was the main element of intervention. During 1975/76 through 1978/79 domestic procurement went up to about 35 percent of marketable surplus of foodgrains. During this period, public distribution through rationing was also operative at a larger scale than before. After 1978/79, although the domestic procurement has remained at a high level (at about 35-40 percent of marketable surplus) the distribution mechanism has been modified to include open market sale of foodgrains for reducing seasonal fluctuation in prices.

Moreover, the procurement, distribution and target price for markets are being planned more systematically with professional inputs in the years of the eighties than the years of the seventies and earlier [39]. The results, as reflected in the seasonal pattern, have been phenomenal. During the sixties the seasonal fluctuation in prices (the normalized harvest and lean season price spread measured as percent of annual average price) was only about 31 percent. During 1975 through 1978/79, this fluctuation went up to about 60 percent. Part of this increase was partly attributable to changes in risk factors related to the civil war, cropping pattern and interest costs. But a substantial proportion of the increased fluctuation could be traced to the haphazard interventions in the market. During 1979/80 through 1983/84, the seasonal fluctuation has again been brought down to the level of about 40 percent through a consciously worked out program of open market sales of foodgrains [39]. The process has of course caused a large shift in storage functions from private to public sectors. A recent survey indicates that about 90 percent of large farmers who used to store foodgrains in the past for sale in the lean season, are now selling to the public purchasing centers immediately after harvest [43].

The Indonesian case is similarly educative. The management of foodgrain stock by a specialized organization called BULOG has often been cited as an example of successful public management of foodgrain marketing. BULOG has a very elaborate program of procurement from farmers and abroad and a program for distribution to consumers through open market sales to maintain a ceiling price in the market. The procurement price and ceiling price have been consciously set and

effectively implemented resulting in a seasonal variation in prices of no more than 15 percent [38]. This contrasts very sharply with the wide fluctuation in seasonal prices of foodgrain in Indonesia (about 35 to 45 percent) in periods before BULOG came into effective operation.

#### D. SOME ADDITIONAL IMPLICATIONS

Budgetary obligation of a government in running public marketing programs in foodgrains is often quite substantial. For example, the Indian foodgrain system under public management involves financial transactions equivalent to 30 to 40 billion rupees (one dollar is equal to about 9 rupees), of which about 6 to 7 billion represent a budgetary subsidy during 1978-80 [21]. The subsidy would be equivalent to about 6 to 8 percent of total public expenditure. Foodgrain subsidy in Bangladesh was running at about 8 to 12 percent of total public expenditure during the mid-seventies [13]. Total financial obligation in operating procurement and distribution of foodgrains in Bangladesh would amount to a multiple of the size of the subsidy.

Two types of implications generally follow from such a large budgetary and financial obligations. The first one is of a macro-economic type and was briefly referred to in a previous section. Normally the subsidy is financed through formal budget allocations and the cash flow problem of running parastatal operations is covered by borrowing from commercial banks. Whether nationalized or privately owned, commercial banks would not generally extend credit to public parastatals without a government guarantee. This procedure tends to pre-empt credit availability for the private sector and thus affecting private sector investment in the economy. On the other

hand, if the government responds softly (i.e. outside its basic formula for controlling money supply), the indirect pressure from commercial banks and the direct need for financing subsidy may create an inflationary situation. This is likely to be true in most (except oil-rich) developing countries which depend largely on indirect taxes (40 to 60 percent) for government revenue.

The second implication of budgetary and financial obligations in public marketing is somewhat microeconomic in nature and concerns price stability. There is almost always a time lag between the commitment of financial provisions to parastatals and the actual crop procurement at harvest. Fluctuation in harvests could render the best financial planning ineffective. Public parastatals do not possess financial flexibilities comparable to those in private trade. Therefore, financial inflexibility and fluctuation in harvest could combine to cause unusual dips in harvest season prices in good production years, particularly in situations where private trade is inoperative or operating weakly. An uncertainty about the scale of public marketing operation may arise from uncertain budgetary resources. This may evoke speculative response from private trade. The objective of price stability--an important target of public marketing--may thus be vitiated by budgetary constraints.

Besides budgetary problems, the implication of public marketing on the quality of products produced in agriculture is seldom taken seriously in policy analysis. A government, for administrative convenience, can not fix prices strictly according to numerous grades and qualities of a commodity. A uniform price generates a strong disincentive for producing quality products. This effect does bear a serious implication, particularly in the case of export products. A study on the Tanzanian agricultural sector provides some clear indications of

an extensive decline in the quality of Tanzania's export crops caused by uniform pricing: The deterioration in quality has severely affected international competitiveness of some agricultural exports from Tanzania [6, 7].

#### E. LESSONS FROM A COMPARATIVE ANALYSIS

Prices are important to both producers and consumers. The potential impact of changing marketing costs on prices received by producers and paid by consumers at one or different points in time, can perhaps be demonstrated effectively by comparative analysis of sharply contrasting cases of Asia and Africa. Research done at IFPRI and elsewhere indicate that marketing margin in African countries is more than twice the magnitude of marketing margin in Asian countries. Farmers in selected African countries receive only about 35 to 50 percent of the price of foodgrains generally paid or ought to be paid by final users. In contrast, farmers in selected Asian countries receive about 75 to 90 percent of the price paid by consumers. This difference is of course not due to any additional services as is generally the case in developed economies. Like marketing margins, spreads in seasonal prices as well as interregional prices are also much wider in African countries than in Asia. If the producer-consumer price spreads in Africa could be reduced to levels prevailing in Asia, it is estimated that African farm level prices would go up by 40 percent in real terms, and the real consumer prices would also decline by 17 to 20 percent.

The question of how to improve upon marketing efficiency thus becomes a central issue. A comparative study between selected African and Asian marketing systems indicate that relative adequacy of

infrastructural facilities and differential efficiency of market functionaries represent the crucial factors explaining the differences in price spreads among countries. The facts that most African countries are sparsely populated (15 to 30 persons per square kilometer) compared to most Asian countries (500 to 750 persons per square kilometer) and that the general infrastructural facilities in Africa are more underdeveloped than in Asia, would imply a higher marketing cost and a general backwardness of agricultural marketing in Africa than in Asia. By 1978, African countries had developed road networks to the extent of 0.01 to 0.11 kilometers per square kilometer of land area compared to 0.15 to 0.41 kilometers of road per square kilometer of area in Asian countries. Moreover, only about 10 percent of the road network in African countries are paved roads compared to around 35 percent of the road network in Asia being paved [1]. In terms of railway and river transport, Asian countries are equally better off. Modes of transportation are more diverse with more numerous options in Asian countries than in Africa.

Rural electrification is another factor that distinguishes the countries of the continents. An absence or a presence of rural electrification makes a great difference in the concentration and extent of grain milling facilities. If grain milling facilities are located in urban areas, transportation costs become higher and the pace of flow of grain from rural to urban areas tends to be erratic with erratic influences on urban and rural prices. In Kenya, Tanzania, Nigeria, and most other African countries, the milling facilities are generally located in urban areas except home pounding for subsistence use. On the other hand, small scale milling

in rural areas of India, Bangladesh, Indonesia and many other Asian countries has been expanding fast mainly due to rural electrification. For example, small scale rice mills in Indonesia increased from 5,000 in 1968 to 35,000 in 1973. Large mills around urban centers contracted over time and by 1979, an overcapacity in rice milling developed [38].

Infrastructural development, important as it is, is a long term venture and needs to be sustained with a steady economic growth. Moreover, infrastructural inadequacy is only a part of the explanation for larger marketing costs in Africa compared to Asia. Even though the absolute transportation cost in marketing is about twice as high in Africa compared to Asia, the share of transportation in the total marketing cost varies only from 25 to 35 percent [15]. Incidence of explicit taxation on foodgrains also does not differ very much between Asian and African countries, although such an incidence is slightly higher in Africa. Therefore, a major share of the difference in marketing margin/price spreads between Asian and African countries must be explained by differences in marketing structure as fashioned by the operation of public and private marketing in the countries of the two continents.

The understanding that reforms in public intervention in marketing is an essential prerequisite for a creative economic environment that will foster agricultural growth is dawning on many countries including those in Africa. Philip Ndegwa's report on Kenya represents one of such recognitions and reflects the common approaches to such reforms [12]. A wholesale abandonment of direct public intervention in food and agricultural marketing would not be a realistic proposition for most developing countries. Introduction of private trade (or

abandonment of public monopoly), to operate side by side with public parastatals, would be the first action of any reform package. Liberalization of regulatory measures (movement restriction, licensing, etc.) would constitute the second element. The policy of liberalization, to be effective, should not be limited to only passive changes (i.e. removal of restriction) but definitely include active measures (i.e. taking positive measures to increase access and facilities to private trade).

The third action which would follow, to some extent, from the first two would limit public marketing activities only to certain strategically important areas, e.g. management of security stock in foodgrains, controlling external trade in grains, supporting prices if necessary only as short term measures in infrastructurally backward and economically poorer areas. The fourth element of a reform package would emphasize management of public marketing so that efficiency of a system could be raised to the maximum level. This would essentially imply an institutional and professional improvement that would ensure the practice of regular evaluation, searching for alternatives, and accountability for actions in government agencies.

#### 4. CONCLUDING OBSERVATIONS

Developing countries do intervene in foodgrain marketing, often undertaking the functions of marketing directly. Fixation of procurement and issue prices constitutes an important element of public marketing. Considerations for multiple objectives and constraints in real world policy formulation make it imperative for governments to adopt multiple principles as the bases of determining administered prices. Cost of production is the most popular among pricing principles

used by developing countries. But the cost of production as a principle for price fixation, does not guarantee an optimal price and involves a number of measurement problems and theoretical deficiencies. This principle, notwithstanding the weaknesses, provides an essential basis for dialogue between groups representing interests of producers and consumers, and serves as a useful cushion against a general pressure for lowering foodgrain prices. World price provides an intellectually clear criterion for setting prices at optimum levels when policy goals are concerned only with economic efficiency. Besides a number of complicated practical problems, many low income developing countries may find it hard to follow this principle in foodgrain pricing on the grounds of poverty and food security. The practice of formulating price policies crop by crop tends to distort relative price structure among all crops and the terms of trade between agriculture and nonagriculture. A general guideline allowing nonstaple prices to be based on world prices and foodgrain prices on both world prices and cost of production (world prices as upper limit and cost of production setting lower limit so long as the latter is below the former and stipulating distributive consideration to play its role in between the two limits) seems to be a pragmatic, second-best formula for fixing administered prices.

Even though an optimal set of relative prices could be administratively determined, the actual outcome will however depend on the nature of marketing system including public marketing that shapes up price formation. Interaction of public and private trade bears important implications for prices to producers and consumers. If a public system is managed efficiently and supported adequately by resources, the spatial, seasonal, and producer-consumer price spreads could be

reduced quite effectively to desirable levels. Cost to society for such achievements could however be quite large. The direct and indirect effect of an inefficient public marketing in agriculture could exert a strangulating effect on economic development. Nevertheless, a wholesale abandonment of public intervention in food and agricultural marketing may not be a realistic proposition for many developing countries. Introduction of private trade (or abandonment of public monopoly) to operate side by side with public parastatals, would deserve to be a first action in any reform package. Liberalization of regulatory measures would constitute the second element; liberalization should not be a passive but an active measure. The third action would limit public marketing to certain strategic areas only. The last but an important action in any reform package would concern management improvement. This would essentially imply institutional and professional improvement that would ensure the practice of evaluations, searching for alternatives, and accountability for actions in government agencies.

Table 1 -- Comparison of domestic and world prices of foodgrains for selected countries, average 1978-80

Country	Commodity	Ratio of Domestic to World Price at Official Exchange Rate <u>1/</u>	Ratio of Domestic to World Price at Shadow Exchange Rate
India	Rice	0.72	0.62
	Wheat	0.80	0.68
Bangladesh	Rice	0.85	0.61
Indonesia	Rice	0.84	0.70
Tanzania	Rice	0.69	0.43
	Maize	0.86	0.54
	Wheat	0.98	0.61
Kenya	Maize	0.80	0.65
Nigeria	Rice	1.20	0.71
	Maize	1.15	0.78

Note: 1/ The price comparison is based on the border price at wholesale level. Tanzania's prices are official prices.

Source: 1. World Bank, Agricultural Sector Studies of Countries.

2. Doris J. Jansen, Agricultural Pricing Policies in Sub-Saharan Africa in 1970s, World Bank, 1980.

Table 2--Spreads in consumer-producer, regional, and seasonal foodgrain prices in selected countries of Asia and Africa<sup>1</sup>

Country	Commodity	Retail Prices as a % of Farmgate Prices (Range)	Difference Between Lowest and Highest Prices Among Regions <sup>2</sup> (Index Lowest=100)	Gap in Price Index from Seasonal Low to High (% Range)
India	wheat	112-125	-	-
	rice	115-130	131	20-25 (Andhra)
Bangladesh	rice	115-130	116	25-30
Indonesia	rice	108-115	115	4-15
Nigeria	rice	140-210	-	35-55
Kenya	maize	150-230	240	45-75
Tanzania	maize	160-260	280	45-75

Note: 1 Prices may represent different years for different countries and commodities.

2 Price spreads represent prices among 15 state markets all over India, 34 provincial markets in Indonesia, 6 regional markets in Bangladesh, 14 regional markets (unofficial prices) in Tanzania and 23 regional markets in Kenya.

Source: Ahmed Rais uddin and Narendra Rustagi, Marketing and Agricultural Price Policies in Selected Countries of Asia and Africa: A Comparative Study. (IFPRI forthcoming).

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