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9. ABSTRACT

India is entering the phase in which marketing and distribution are critical elements in feeding the hungry. An example of this marketing problem came with the introduction of hybrid maize into Tamil Nadu. Maize production could not realize its full potential, because market outlets were not established clearly. Too, the farmer must have a relatively high degree of assurance that there will be a satisfactory market for his crop before he plants it. With these general problems in mind, the objectives of this study were as follows: 1) to describe the present market organization and infrastructure for the food grains; 2) to determine the capacity of the present system to handle the projected increases in food grain production; 3) to outline significant changes needed to avoid serious marketing problems with state marketing and government officials. It was found that politics must be put aside when making important marketing decisions, dogma and form must be ignored in setting up new market institutions, and concentration must be on the changes required to modernize the present market structure and to build the capability in the responsible organization for making the changes deemed desirable.

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MODERNIZING THE MARKET STRUCTURE FOR FOOD GRAINS IN TAMIL NADU



The present marketing system needs modernizing

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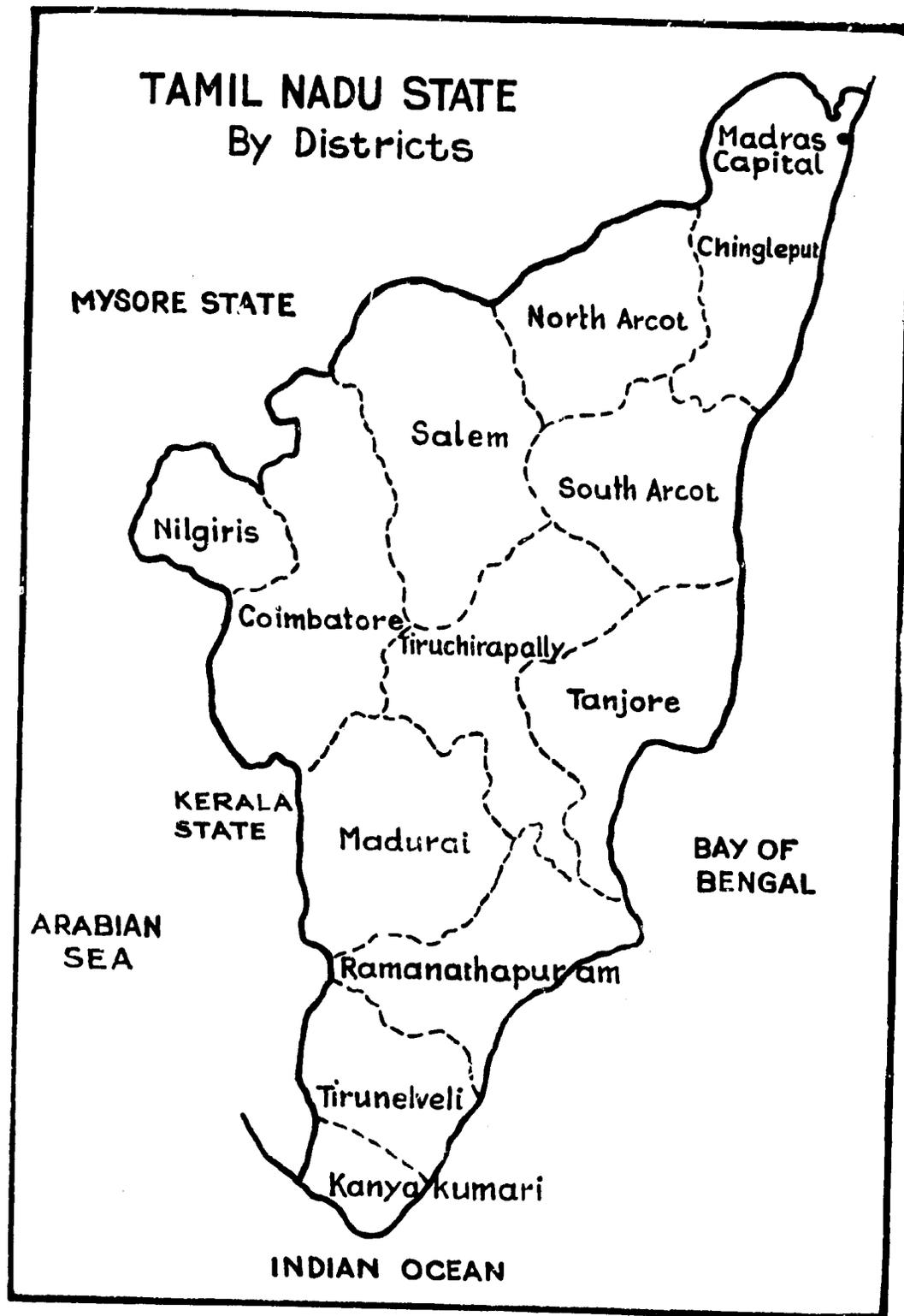
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Marketing Economist

AGRICULTURAL PRODUCTION PROGRAM

UNIVERSITY OF TENNESSEE - U.S.A.I.D.

TAMIL NADU

TAMIL NADU STATE By Districts



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FOREWORD

Feeding the hungry in India is entering a new stage. For years the problem was seen as one of producing more crops, and this is still a critical need. But production is the first stage in providing food; marketing is the second stage. With the means of increased production available and being put into practice through such programs as the United States Agency for International Development/University of Tennessee Agricultural Production Program in Tamil Nadu, India is entering the phase where marketing and distribution are critical elements in feeding the hungry. The problem of the nation's food supplies can be best expressed in terms of getting the food that can be produced to the people not getting it now.

An example of the critical nature of the marketing problem evolved this past year with the introduction of hybrid maize in Tamil Nadu by the University of Tennessee Agricultural Production Program team. There was no clearly defined market for this product. Maize production therefore could not realize its full potential because market outlets were not clearly established. The farmer must have a relatively high degree of assurance that there will be a satisfactory market for his crop before he plants it.

It was with these general problems in mind that Dr. M. B. Badenhop was requested to provide assistance. Specific objectives of his assignment were :

- 1) to describe the present market organization and infrastructure for the food grains,
- 2) to determine the capacity of the present system to handle the projected increases in food grain production,
- 3) to outline significant changes needed to avoid serious marketing problems in the future, and
- 4) to help create an awareness and concern about marketing problems with state marketing and government officials.

With the evident zeal that Dr. Badenhop has shown during the past three months in giving perspective to the marketing dimension, I am sure his contribution to the understanding of what is required to modernize the present marketing system for food grains will be substantial. This is particularly significant since projected increases of food grain production resulting from planting new high yielding varieties is considerable.

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MODERNIZING THE MARKET STRUCTURE FOR FOOD GRAINS IN TAMIL NADU

M. B. BADENHOP*

I. INTRODUCTION

Nearly three-fourth of the Tamil Nadu's 40 million people live in 14,100 rural villages.¹ A typical farmer living in one of these villages cultivates a small fragmented and dispersed holding and is at a disadvantage in marketing his produce. The spatial area in which he can sell is limited by his inadequate transport facilities; the produce he has to offer is small in amount, ungraded, and hence lacking in uniformity of quality. Since he has few financial reserves, he usually must sell his crop immediately after harvest, and because many of his neighbors must do likewise, village traders can, singly or collusively, offer low prices. If he has borrowed money from a village trader, he is under even greater compulsion to sell, since unless he repays, or at least reduces his indebtedness, he cannot borrow in the future. Nor has he adequate ways of knowing whether the prices offered are reasonably fair since he has no dependable market information of which to base his asking price. These are the circumstances under which Tamil Nadu is developing its Fourth Plan aimed at providing farmers the needed fertilizer, improved seed, and pesticide materials necessary to produce their share of food grains in India's overall plan.

In the Fourth Plan, Tamil Nadu agriculture will not only be called upon to rebound from the food deficit levels of the mid-sixties, but also feed the tens of thousands additional people who will swell the population by the

* Time available permitted only cursory review of selected materials and sources of information. The statement, therefore, lacks the substantial benefit of intensive study of many of the aspects of marketing and particularly its relation to other development problems in Tamil Nadu. I am extremely grateful to the many Indian officials who kindly shared their views and experience on many aspects of marketing which provided an initial perspective of the present and potential parameters of food grain marketing in Tamil Nadu. Thanks are also due to the Agricultural Production Program staff of the University of Tennessee team in Tamil Nadu, the administrative staff of the Agricultural College and Research Institute, Coimbatore, and the Department of Agricultural Economics of the Agricultural College and Research Institute who arranged conferences and discussions on the problem of marketing food grains.

¹ *Indian Agriculture in Brief* Ninth Edition, Directorate of Economics and Statistics, Ministry of Food, Agriculture, Community Development, and Cooperation, Government of India Press, New Delhi, 1968, pp. 6 and 3.

mid-seventies. The diet of thousands more who are now underfed needs to be improved. To do this, it will simply not be enough to produce the necessary inputs for agriculture, to help the farmer pay for them, and to teach the farmers how to use them. The essential inputs must be made available at the time and place they are needed. Market outlets for surplus production must be provided.

The process of shifting from traditional to modern agriculture as exemplified in Tamil Nadu from the Agricultural Production Program experience and the Intensive Agricultural Development Program in Tanjavur District, indicates many difficulties in initiating such a shift and in sustaining the integrated effort required to maintain the momentum and extension of this experience. Because of the production surplus which may be generated as a result of these programs, marketing problems begin to emerge. Certainly, marketing dimensions must be included if the momentum of production transformation is to be sustained.

Adjustment of thinking of administrative programs and policy directions are needed as a result of these encouraging developments. Marketing problems occurring from the increased production with respect to movement and storage are beginning to dramatize the urgency of orderly and efficient marketing and should be reflected in concern by planners at the State Government level.

Agricultural marketing in this context refers to all the marketing functions or physical services that occur between the village farmer and the ultimate consumer.² These include principally the assembling, transporting, storing, processing, grading, packaging, and price reporting of farm and food products. Marketing also includes such economic intangibles as the role of marketing and market structures, pricing of products at different stages in the marketing process, costs and efficiency analysis, market forecasts, and the financing and risk-taking operations essential to the movement process.

² A hasty review of the limited available agricultural marketing literature in Tamil Nadu suggests that marketing research is largely cast in a framework of traditional agriculture. Some exceptions were noted for the plantation crops that historically have had some exposure to export outlets. For the most part the literature is of a descriptive nature and valuable for this purpose alone. Essentially, inadequacies in data series, product identification, standardization, packaging, market information, storage, road networks, transport, and market facilities exist. Also, inadequacies result from alleged malpractices that occur in the market place. Correcting these inadequacies are opportunities that must be assumed for market transformation to take place. Production and marketing practices must surely change together if the full potential impact of increased food production is to be derived in terms of orderly distribution of good supplies to the consumer. Only if this is done simultaneously can market and price indicators be accurate to the farmer.

II. THE SETTING

India's target for production of food grains by the end of the Fourth Plan (1974) is about 129 million metric tons per year.³ This means 57 million more tons annually than in the great drought of 1965—66, and 33 million more tons than the record high of 96 million tons in 1968.⁴

Using the projection of 129 million metric tons of food grains production by 1974, there will be a minimum of 45 million tons, the average production increase needed over the two crop years cited, to meet the projection target, all of which must be purchased, stored, transported, and sold in 1974. This estimate is reasonable in terms of recent experience with high-yielding varieties, the expanded use of chemical fertilizers and other quality inputs, and the rise in prices because of extreme food shortages resulting from the drought conditions of 1965—66 and 1966—67. It is made on the assumption that at least one-third of the total food grains produced will move to the urban centers for consumption.

Tamil Nadu's contribution to India's food grain production in 1967—68 was 6.2 percent of the nation's total, or 5.9 million tons. Assuming this relationship holds through the Fourth Plan, Tamil Nadu farmers in 1974 will have to produce an additional 2.8 million tons over their 1967—68 production to meet their share of the nation's production. Their primary contribution to food grains will be rice since rice makes up 72 percent of this food grain production.

The strain on the marketing system in Tamil Nadu will be considerable if it is to market effectively the projected increase. This 2.8 million metric tons would require 28,000,000 additional gunnies. Their movement through marketing channels would take 117,000 railway wagon loads or 467,000 lorry loads. The increase in terms of farmer sales transactions at the present average of 4 quintals per sale would represent 7,000,000 additional individual sales transactions. Storage space to accommodate this amount would require 155.6 million cubic feet.

It is true that food grain production is widely dispersed throughout Tamil Nadu. It is also true that production is spread over two crop seasons and in some cases over three.⁵ But even so, the magnitude of the marketing operation is huge and unless the present antiquated and obsolete marketing system is modernized, it will be extremely difficult to move these quantities to

³ Yojana, Fourth Plan Summary, Special Number, Thirteenth year 7, April 20, 1969, Government of India, Publication Division, New Delhi, p. 14.

⁴ *Economic Survey, 1968-69*, Government of India, Publication Division, New Delhi, 1969, p. 60.

⁵ In Tamil Nadu, where a wide range of natural conditions prevail, sowing and harvesting of paddy goes on almost all year around. At least five harvest seasons are noted

the consumers without considerable wastage and spoilage which the State can ill afford. Actually, the marketing system will have to expand at a much higher relative rate than production, since a large proportion of the increased output would require commercial marketing.⁶

Prevention of wastage of loss is important in increasing the amount of food grain available to consumers. At present, losses in India are extremely high (Table 1). If even half of the total losses could be prevented there would

TABLE 1. Food grain losses in India

Item	Percentage	
	Minimum	Maximum
Field or pre-harvest	15	25
Post-harvest handling	3	5
Storage	10	15
Defective processing	3	5
Transport/Transit	4	5
Hotels and households	5	6
Total	40	61

Source: H. A. B. Parpia, "Utilization of Food Science and Technology to Achieve Self-Sufficiency in Food", *Special Lecture Series, 1966-67, Number 2*, Indian Institute of Science, Bangalore.

in a year. An early crop, known as Kar-Samba, is harvested in August and September in Kanyakumari and parts of Tirunelveli district. An early Kar or Kuruvai crop is harvested in September-October in parts of Thanjavur, Madurai, Tiruchirapalli and Tirunelveli districts and in Chidambaram taluka of South Arcot District. An early Samba crop is harvested in December-January. It is raised widely in Thanjavur district and is a major single crop in Tirunelveli district under river fed channels and under rainfed tanks in all places in the State. A late samba crop is harvested in February-March in Thanjavur, Tiruchirapalli, Madurai, Tirunelveli, South Arcot, North Arcot and other districts where long duration paddy is under tanks, channels and wells. A hot weather crop is harvested between April and June. It is raised as a second crop in certain portions of Madurai, Ramanathapuram, North Arcot, Chingleput and South Arcot districts depending upon the availability of water in the wells and tanks. A major portion of the paddy is harvested between October and January in these districts. This period consists of two major harvests, namely Kuruvai in October and early Samba in November and December. Tirunelveli and Chingleput raise substantial amounts of late Samba paddy maturing in February, March relative to their total production, although in absolute terms, it is not comparable to the crop size in Thanjavur. See Uma Lele, "Working of Grain Markets in Selected States, India, 1955-56 - 1964 - 65", *Occasional paper No. 12*, Department of Agricultural Economics, Cornell University, USAID Price Research Project Dec. 1968, pp. 213-214.

⁶ For example, a small farmer producing 24 quintals of paddy used 16 quintals for his family and markets the remaining 8. When he increases his production by one-third, or 8 quintals, and seeks to market most of his additional production, the one-third increase in production results in an 90 percent increase in marketings. If he cannot market his extra quintals at a reasonable price, he will likely to revert to producing for his family alone.

be an additional supply of approximately 20 million tons of food. This would go a long way to help overcome the food shortage. In modernizing the marketing system, effective action at all levels of the marketing sector must be taken to prevent or reduce such losses.

III. THE MARKET STRUCTURE FOR FOOD GRAINS IN TAMIL NADU

Before developing the program elements for marketing that are consistent with the prospects of technical breakthroughs in food grains production, it will be useful to review the traditional market structure. The role of various agencies in performing the marketing functions varies significantly from one region to another in India. Even in the States where village sales are predominant, the importance of the processing agencies differ.⁷ In general, the market structure for the different food grains however is similar.

Since rice makes up approximately three-fourths of the total food grains production in Tamil Nadu, the channels through which it flows in the private sector enroute from producer to consumer are described (Figure 1).⁸ Most of the paddy that is not kept for domestic consumption,⁹ seed, and payment in kind, is sold by the cultivators in small village markets or on the paddy fields and then moved to the larger markets through a complex network of intermediaries.

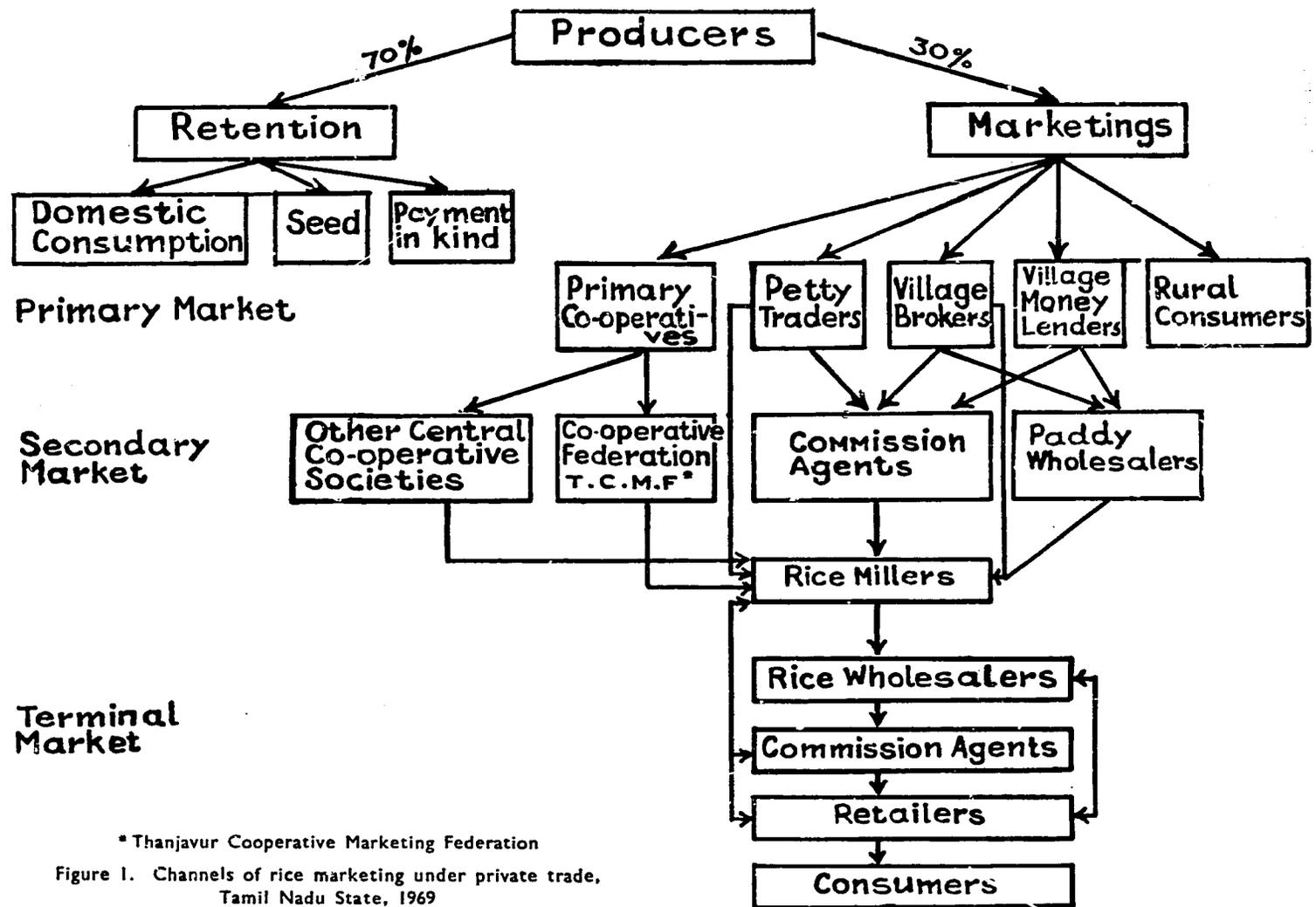
INTERMEDIARIES

Village sales of paddy are the predominant way in which producers dispose of their marketable surplus. Contrary to general expectations, this type of sales is believed to be on the increase. In the last few years rice

⁷ *Rice Economy of India*, Ministry of Food and Agriculture, 1961, p. 17. It is estimated that in Andhra Pradesh and Punjab, 82.5 percent and 76.2 percent respectively, of total arrivals in the wholesale markets are brought by cultivators as compared to 10 percent in Madras, 20 percent in Orissa, and 30 percent in Uttar Pradesh.

⁸ The description of the market structure is based on personal interview of rice millers, wholesalers, commission agents, and traders. Time did not permit statistical documentation, therefore, these statements are informed opinions. In general the findings are consistent with those described by Uma Lele, *Op cit.*, pp. 219-223.

⁹ Almost all the paddy retailed for domestic consumption is converted to rice through husking machines and rice mills. Handpounding is of little significance. (*Report on the Marketing of Rice in Madras*, Office of the Madras State Agricultural Marketing Officer, 1963). In 1953-54, 87.2 percent of the rice produced in Orissa and 70.2 percent of the rice produced in West Bengal was handpounded, whereas only 8.2 percent of the total production was handpounded in Tamil Nadu. In more recent years, handpounding is estimated to have declined to barely one percent of the total rice production in Tamil Nadu.



* Thanjavur Cooperative Marketing Federation

Figure 1. Channels of rice marketing under private trade, Tamil Nadu State, 1969

millers in surplus area as well as in the deficit areas have in general arranged to buy paddy directly from the villages through petty traders and brokers in order to avoid unnecessary expenses, such as the commission charges of various intermediaries, taxes, and incidental charges. Many village agents, brokers, commission agents and their subagents purchase paddy for rice millers directly from the villages. In addition, there are village retailers, paddy wholesalers, and professional dehuskers who purchase paddy from cultivators in varying amounts. The role of the landlords and large producers in assembling paddy has not been very significant. Keen competition exists in paddy assembly which tends to discourage cultivators from spending their time and effort in taking paddy to a primary market.

Among the numerous intermediaries, village agents primarily petty traders, brokers and subagents, are the most important middlemen in assembling paddy in the State. They purchase the paddy in villages and move it to the major assembling centers where they sell it to a local rice miller, a paddy wholesaler, or an agent of a rice miller in a distant terminal market. These village agents usually lend cash to the farmer a few months before harvest. These agents, in turn, are often financed by the rice millers and paddy wholesalers. The rate of interest charged on these loans is not clear. Some rice millers stated that they loaned money through their agents when it was least needed in their trade and, therefore, did not charge interest but considered this procedure a good way to be assured of obtaining the cultivator's crop. Other millers claimed they charged a small deduction in the price paid to the cultivator for his paddy. From the figures quoted on price deduction, interest did not amount to more than 10 percent during a six-month period. Village merchants in general kept in continuous touch with market conditions and prices by frequently visiting nearby wholesale markets.

Due to the dominant role of the millers in paddy purchases, the wholesalers occupy a secondary position in the paddy trade at the primary market level. They are, nevertheless, important intermediaries in the surplus areas where they often purchase paddy for their own account through commission agents and then sell the paddy to millers in secondary and terminal markets. The turnover is rapid and the margin and amount of capital usually small. Some of these traders deal only in paddy. Others convert paddy into rice by paying a fixed milling charge and then by selling the rice locally or in terminal markets. Rice millers generally purchase paddy through numerous commission agents, village merchants, and brokers. These intermediaries are usually paid a fixed commission per bag of paddy purchased.

Milling in general, is not concentrated in the major rice producing areas. Instead, much of it is done in terminal markets located in the deficit

producing areas, and hence, an elaborate network of agents and subagents for handling paddy has evolved over a long period of time. The terminal markets consequently receive a large quantity of paddy which is converted into rice and then sold to local retail outlets. There are a large number of rice mills in Kerala State and the Coimbatore District of Tamil Nadu which purchase paddy from the Thanjavur District. In addition, there are numerous centers, such as Tiruchirapalli, that are termed secondary markets. Traders in these centers purchase paddy from surplus regions, convert the paddy into rice in the local mills and then send it to Kerala State for sale on their own account. In Tamil Nadu, it is noted that only 55 percent of the rice mills are located in the major rice producing districts of Thanjavur, North Arcot, Tiruchirapalli, South Arcot, Tirunelveli and Chingleput. The remainder of the rice mills are located in the major consuming centers.¹⁰

As a result of the dispersed nature of milling and wholesaling of paddy, it is difficult to identify whether stocks are held in the primary or terminal markets. Unlike the primary market traders of *jowar* and wheat who mostly purchase these food grains on behalf of the principals in the terminal markets, most of the rice millers in the primary markets trade on their own account. After a careful survey of the prices in various markets, the millers usually send the rice they own to their agents in terminal markets with specific instructions about when and how much to sell. Stocks are usually held as paddy and converted into rice just before the shipment is sent to the terminal market.

PROBLEMS IN THE PRESENT SYSTEM

The present obsolete marketing organization is characterized by a number of problems. Some of the more urgent ones are related to roads and transport, storage, processing facilities, market communications, and marketing practices. These require immediate attention if progress is to be made toward modernization.

1. Village roads in many areas are poor and inadequate with many of them being impassable during the monsoon season.
2. Means of transport are often primitive. The bullock cart is the mode by which most food grains are moved to the nearest market.

¹⁰ *Report on the marketing of rice in Madras State, 1963*, issued by the Madras State Marketing Office. There were 2,411 rice mills reported in operation in 1962. Practically all of them were of the huller type and are relatively small, the modal size having a capacity to mill from 50 to 75 quintals per day. The total milling units (including single hullers) was reported as 8,903 in 1965 (See *Report on Rice Marketing*, and *Bulletin on Food Statistics, 1966*). In general, there is a tremendous under utilization of the milling capacity available which has resulted in a high cost structure and high margins.

Railway wagons and lorries are in short supply. Transport costs are high.

3. Storage facilities are inadequate, particularly at the village level. Most facilities are not rodent-proof. Very little standardization or grading of the products placed in storage is done. Secondary and terminal market storage is insufficient and badly in need of modernization. No facilities of significance for bulk handling are available.
4. Processing of food products is extremely limited and often defective.
5. Market news reporting is limited in scope lacking timeliness and reliability with respect to supplies and price in most major market centers.
6. Standardization and grading of food grains are generally not done and farmers are not rewarded for producing high quality produce.
7. Weights, scales, and measures are not standardized or regularly inspected.
8. Major wholesale markets are antiquated, often poorly located, poorly designed, and with inadequate road and storage facilities.
9. Retail markets generally are small and handle a limited number of products. Only a small number of food items are packaged.
10. Sanitation at all market facilities is generally very poor.
11. Insects reportedly cause post harvest losses of at least 10 percent of cereals; rodents are reported to cause an added loss of 10 to 20 percent of stored grains.
12. A large number of middlemen operate between the grower and the ultimate consumer. Many of them engage in numerous malpractices in handling food grains.
13. Many farmers are not free to sell their crop in the market because of loans against the crop from the village money lender, who is often a middleman, and to whom they are under obligation to sell the crop. As such, they cannot hold their produce after harvest to wait for a higher price. Interest charges for loans are generally high.
14. Farmers generally are not aware of market conditions and have little knowledge of market price.

15. Farmers are often subject to pay a large number of market charges on various pretexts, such as deduction on account of charity, possible loss of weight, and impurities in the produce.

These and other defects in the market organization result in a considerable price spread between the prices received by farmers and the prices paid by consumers. Marketing charges have been estimated to be about 40 percent of what the consumer pays for his rice.¹¹

IV. MODERNIZING THE PRESENT STRUCTURE

A modern marketing system is the critical element in two aspects of the food problem. First, the system must serve the interests and needs of the producer and thus provide an incentive to higher production, and second, it must bring the food to the consumer when he needs it and at prices he can afford. If these criteria are met, then the surge in food production expected can have a noticeable effect on solving the food grain shortage. The central problem is one of organization. It has been defined by Kiehl¹² as a problem of attaining organizational efficiency. This is true in a broad and technical sense, and it is one of the most difficult concepts to understand. It is true whether one is speaking of organizing the resources of individual farmers, organizing local supply services and credit facilities, or organizing marketing services, such as processing, packaging, transport, storage, and a market information system. In total it means a massive organizational task. Countless decisions of many participants become involved in the transformation from the traditional market to a modern marketing system. The transformation must be accomplished with great administrative skill and understanding. All planning and the programs that evolve must recognize from the beginning and throughout the process the positive and active role of the governmental administrative units whether they be at the Center, State, District, or Village level.

PROGRAM ELEMENTS

Many institutional elements become intertwined in modernizing the market structure that ultimately affects the whole economy. Many of these elements affect and involve the social and political environment complex in

¹¹ Shariff, Ismail, "Rice Marketing in India and Mysore State: Problems and Solutions," *General Report, Unnumbered*, Department of Economics, University of Wisconsin, Green Bay, 1968. It is assumed that the farmer's share of the consumers' price for rice is the same in Tamil Nadu as it is in Mysore State.

¹² Kiehl, Elmer R., "Agricultural Marketing in India, Role Strategies and Implications," *Expanding Horizons for Indian Agriculture—No. 3*, The Ford Foundation, New Delhi, January 1969.

which the adaptations take place. Several of these elements are discussed briefly.

*Regulated Market Development.*¹³

Presently, 93 regulated markets are in operation in Tamil Nadu. The target is 150 such markets to be in operation by the end of the Fourth Plan.¹⁴ Thus, it appears that these markets are an essential component of the modern agriculture concept. Efforts will be required, however, to adapt them to the evolving challenges they face. They may have to be restructured somewhat with respect to trade and agency practices and in the strengthening of the intangible marketing aspects with respect to price making mechanism, market news information, and dissemination of market intelligence. Although physical inadequacies are apparent, regulated markets should be retained as a base for further developing the agricultural market economy. It is particularly important that these markets be developed further from the standpoint of their functions in terms of price discovery. This feature is highly essential because it is at these primary markets that the forces of supply and demand become registered for the first time at the village-cultivator level. Much of the future government policy at the State and Center level with respect to food and agriculture will be dependent upon the awareness of the supply and demand position for all of India as well as in the surplus generating production areas. It must be recognized that major wholesale markets in terms of the urban cities have not yet been fully developed. Regulated markets at the primary level are in existence and an effort should be made to encourage physical modernization and further refinement and uniformity of the rules and regulations relating to trade practices within and between states.

From limited observations these markets appear to function quite well. Trade practice aspects are generally favorable in terms of competitive interrelationships within the market. Volumes handled by these markets, however, are quite small. In view of handling larger physical volumes, studies should be initiated for redesign and in some instances relocation of these facilities in terms of potentially greater volumes that will have to be handled. It would appear that a simple redesign in terms of layout, utilization of cleaning, weighing and grading equipment, and the development of rational vehicular traffic and product flow should be incorporated in the redesign. Attention should also be paid to the influence of design and layout on the function of the market as a price registering and price discovery center. Provision should

¹³ National Council of Applied Economic Research, *Market Towns and Spatial Development in India*, Hoe and Co., Madras, October, 1965, pp. 44-71.

¹⁴ These figures were supplied by C. R. Thiruvengadam, State Marketing Officer, Tamil Nadu, June 4, 1969.

be made for developing the appropriate market news and dissemination aspects of these markets and these aspects should be incorporated in the design.

Cooperative Societies

Cooperative societies should be strengthened at the local level. They need to be viable societies and large enough to be effective in both credit and marketing activities. Such societies can provide effective competition to the private trade and assist in guaranteeing that trade practices will be fair to both farmer and consumer. Thus, it is appropriate that the state government continue to assist farmers in developing cooperative organizations to market their products. The intentions of governmental assistance to the cooperative societies should be an efficient business organization as determined by financial statements and independent operating status at the earliest opportunity. Performance, not size, should be the important consideration, and the performance of a cooperative will be good where it is both independent and efficient. Once a set of independent, efficient farmers' marketing cooperatives are in business to provide farmers with a realistic alternative to the private trade, the private trade will become more honest and efficient.¹⁵ The marketing operations of the cooperative societies should be coordinated closely with the marketing activities of the regulated markets.

From a number of observations, it would appear highly desirable that the membership of the cooperative societies be encouraged to play a more active role in the policy making decisions affecting the operation of these organizations. For each society, it would appear desirable that a manager be employed and be responsible to the Board of Directors within the framework of the cooperative principles. Thus, the manager would have the incentive for carrying out intensive educational programs for the membership. It would be desirable that a management development program be organized on a sustaining basis to meet the needs of the management of the cooperative societies. The basic concepts of good management and administration should be understood by all managers and members of the Board of Directors of these organizations.

Storage Aspects of Marketing

Attention must be given to the location and size of storage facilities required to handle and move food grains into consumption. The storage problem needs to be attacked at both the village level and at primary, secondary, and terminal market levels.

Village level storage is highly individualistic, unorganized, and primitive. A large variety of receptacles of infinitely variable capacities are

¹⁵ Cochrane, Willard W., *Food and Agricultural Policy for India*, The Ford Foundation, New Delhi, April 1968, pp. 35-36.

used. Receptacles are made of straw, bamboo splits, mid-ribs of coconut palm leaves, mud, wood, and granite slabs. Pits are sometimes used and are generally lined with a plastering of cow dung or a fabrication of straw. Losses of food grains in these type facilities are high.

The development of improved village level storage has merit. A number of small receptacles are in the planning and development stage in India. The three most commonly used material to fabricate these are metal, asbestos cement, and wood. Asbestos cement storage bins of 5 to 25 quintal capacity, being constructed by a local firm in the Coimbatore District, show considerable promise in meeting village storage need.¹⁶ Limited information suggests that these apparently provide relative inexpensive storage and make possible opportunities for appropriate storage pest control measures.

The prospect of village level storage is appropriate in that it would spread out the marketing season and reduce immediate pressure on transport and other storage facilities. Insofar as village cultivators can be encouraged to invest their own capital in the development of these types of modern storage bins, it would appear to be a positive contribution to the storage problem. With the limited network of roads, the development of local storage facilities would place less pressure on transport when weather conditions become adverse. Probably more important, however, is that it makes the cultivator a more direct participant in marketing. He begins to understand that a modern agriculture means a market oriented agriculture.

Market level storage is more sophisticated than village stores, but it is far from adequate for the demands that will accompany the anticipated marketable quantity of food grains.¹⁷ Research is needed to identify key market service centers in which food grain storage facilities of modern, efficient, rodent-proof design should be constructed. The storage space constructed should be designed to encourage a shift to bulk grain handling and storage from the customary method of bagged grain handling and flat warehouse storage. Each facility should have trained personnel in charge capable of grading accurately certain varieties of marketable farm produce. Given these facilities and given such trained personnel, farmers in villages within convenient transport radii would soon find that by bringing their produce to the new grading and storage center, they could obtain higher prices than from unscrupulous village traders. Moreover, they could make advance contracts

¹⁶ For further information on this type of village storage facility, contact the Dean, Agricultural College and Research Institute, Coimbatore-3, India.

¹⁷ It has been estimated by USAID agricultural advisors that India must double her agricultural produce storage capacities by 1975 (from 20 million tons in 1967 to 41 million tons by 1975).

for delivery of produce and receive advances of credit with which to purchase seed or fertilizer.

In connection with the development of improved regulated markets, a component of storage becomes essential at that level. Whether these are developed by private storage warehousing concerns or by the marketing cooperatives probably is immaterial. However, they should be physically located to minimize the physical handling of the product in the movement from the village to the consumer. They should be organized in such a way that sanitation and insect control can be carried out efficiently. Bulk storage should be encouraged. The capacity of existing facilities could be increased materially by shifting to bulk storage methods.

Grain conditioning is a necessary corollary to storage. At the village level, it consists primarily of spreading it in the sun on beaten earth or the adjacent highways. This is not only an unsatisfactory method but it cannot possibly expand to accommodate the projected increase in volume.

Each storage installation at the market level should ultimately provide means for aerating, mechanical drying, and fumigation. Drying capacities will vary by areas and the degree of moisture present at the time of harvest. In some of the major paddy regions, like the Thanjavur District, all production should be mechanically dried. The present policy of the Food Corporation of India relative to the operation of the existing drying mills under their jurisdiction in the Thanjavur District needs to be reexamined. The volume of paddy dried by these mills should be much greater than the volume dried last year.

Transport Strategy for Agriculture

India's low-capacity, high-cost transport is presently unequal to the task that a modern agricultural marketing system would impose upon it. Urgent attention must be given to this important problem. At the local level, transport, instead of being handled as a separate problem, should be made part of a total strategy for increasing the food supply and for bridging the gap between the industrial sector and the rural areas.¹⁸ If the resources available to improve agriculture are to be employed to maximum advantage, it is necessary to weigh the merits of various combination of inputs. Policy makers should avoid overemphasizing transportation to the neglect of the

¹⁸ For an excellent discussion on the directions in which Indian transport policy should move to release dynamic new forces for India's economic lift-off, and to suggest in broader perspective how distance affects development, read Owen, Wilfred, *Distance and Development: Transport and Communications in India*: Transport Research Program, The Brookings Institutions, Washington, D. C., 1968.

combination of roads, vehicles, storage, and processing solutions that together will bring the highest returns to farmers.

Instead of planning transport in isolation, a system approach to agricultural development is essential to link transport policy with the goals that transport is called upon to serve—in this case to increase the production and marketing the food. Success will call for the close collaboration of transport and agriculture officials at both national and local levels. A basic requirement will be flexibility in plans and in the use of development funds.

Travel transport capabilities in the private sector are essential to meet the expanding needs of a modern marketing system. Large numbers of light trucks will have to be supplied for farm use and local delivery services, for agricultural pick up and delivery, and for private over-the-road haulage. The expansion of the States' motor vehicle fleet should receive high priority in Fourth and Fifth Plan Period.¹⁹

The rail system in Tamil Nadu will have to be modernized to enable it to concentrate on the task of moving additional production to market in the coming decade. Consideration should be given to equipping trains for the movement of food grains in bulk from the production areas to secondary and terminal markets. Rail service should be integrated with the trucking service at all key market points.

Markets located in the eastern and southern part of Tamil Nadu are predominately served by meter gauge railway. Tiruchirapalli is the only market other than Madras City which is served both by broad and meter gauge. The mixing of gauges results in excessive handling costs when goods have to be transferred from meter gauge wagons to broad gauge wagons for transshipment. Excessive delays frequently result in the movement of goods and losses occur, particularly during the monsoon season. Every effort should be made to change the rail transport system to the broad gauge railway within the next ten years. Improvement to services already obsolescent need to be avoided.

Rural Road Development

For food grains to move efficiently at lower relative costs to market centers, rural road development is essential even for the most elementary forms of transport. It is becoming apparent that some of the larger village centers in

¹⁹ India's motor vehicle fleet is among the world's smallest in relation to population. The number of trucks per 1,000 inhabitants in India is 0.5 compared to 8.7 in Brazil, 9.5 in Mexico, 2.1 in Thailand, 2.0 in Ghana, 35.0 in Japan, 29.4 in the United Kingdom, and 69.4 in the United States. See U. S. Department of Commerce, Business and Defense Services Administration *World Motor Vehicle Production and Registration, 1963-64*, January 1965.

Tamil Nadu are taking on the characteristics of market and service centers to other villages surrounding them. It is also apparent that in order for these market service centers to serve efficiently the needs of the outlying villages for agricultural inputs and for the marketing of their produce, a better road network must be developed.

In many instances, new village-to-town roads will have to be built. In other situations, the widening, ballasting, ditching, and bridging of existing roads will have to be accomplished. These changes will represent important critical investment. It would appear that in terms of the fragmentation of typical land holdings, great care will have to be exercised in locating the roads. A determination will have to be made concerning which service centers ought to be connected and to what extent they can service other village communities. The problem is further complicated by requirements of irrigation works and other public facilities through which or over which roads must be constructed. Road building materials, for instance, in the Thanjavur District, are scarce and the cost of transporting them to needed locations will be high. Nevertheless, one cannot expect the rural areas of Tamil Nadu to increase their market potential as much as they are capable of doing when so many of its farmers live in villages considerable distance from all-weather roads.²⁰ The concern of the local community leadership might be developed and aroused for unity, concern, and determination to develop the kind of road network needed. Public investment will be required.

Processing Food Grains

Processing food grains is not only an important means of avoiding physical wastage, it also simplifies transportation and spreads the period of consumption. Processing and preserving activities introduce a concentration point for movement of commodities and hence serve as a focal point for improvements in both supply and distribution channels. Where plants for processing and preserving foods can be located in rural areas, they can provide much needed employment for those now underemployed much of the year.

The scope for developing industries for processing food grains is unlimited. New units must take into consideration not only the manufacture of the main product but the utilization of every by-product, which in turn, depends upon the size of the industry. Emphasis should be on nutrition and the avoidance of waste. It appears that expenditure on efforts in this direction would be a sound investment and bring substantial economic returns.

An example of what can be done is found in the operation of a modern rice mill of the Tanjore Cooperative Marketing Federation Ltd. This new

²⁰Owen, Wilfred, *Op. cit.*, pp. 52-60.

modern rice mill with a capacity of 4 tons of paddy per hour obtained a yield of 5 to 8 percent more rice from the same quantity of paddy when milled than was obtained from conventional huller mills. The bran that comes from a modern rice mill is also of higher quality without admixture of husk and contains about 20 percent oil. Plants for extraction of oil from bran could be installed. This oil is edible and the deoiled bran can be used to manufacture a high quality cattle feed. It also has a good export market. Supplies of paddy are adequate in many market towns in Tamil Nadu for a modern rice mill of 3 to 4 tons capacity of paddy per hour.²¹ These mills would obviate many of the functions that are now being performed by a chain of intermediaries who in their totality are responsible for excessive marketing costs because of charging for necessary service.

Barriers to Movement of Food Grains

An important step in the direction of a rational marketing system involves the elimination of trade barriers so that farm products may move from a surplus area to a deficit area in the most economical manner. The bilateral trading arrangements existing between states as a result of the central government's policy of creating food zones do not contribute to effective food management and result in certain economic disadvantages such as reduced incentives to increase production and inefficiencies in the movement and handling of food grains.²² From an economic point of view, food zones restricting the movement of food grains should be eliminated.

Another step in the development of a rational marketing system is the development and implementation of a food policy that is capable of skimming off burdensome food grain surpluses in the best producing areas, storing that grain in modern efficient structures, moving that grain in a rational low-cost pattern, and marketing it in the chronically deficit areas. More is required than merely improving governmental operations. Private marketing organizations with modern efficient structures and equipment, with adequate credit, and with a wide range of trading connections will be required to market the bulk of the food grains.²³ The private trade should be encouraged and given assistance to develop the physical and institutional organizations that are basic

²¹ Extracted from a statement prepared by the management of The Tanjore Cooperative Marketing Federation Ltd., Tiruvarur Modern Rice Mill Project.

²² It remains a fact that many Indian politicians and most government administrators and economists believe that effective food management is dependent on the maintenance of food zones. For an excellent discussion on the issues centering on food zones and food management in India, see Cochrane, Willard, *Op. cit.*, pp. 2-10, 17-21 and 23-27.

²³ *Ibid.*, p. 34.

to a market structure. This means that technical assistance to the private trade with regard to storage, product movement, and processing is in order; new institutions must be developed such as market news, nation-wide grades and standards, regulated markets, cooperative societies, transport systems, and so on.

Movement of food grains within Tamil Nadu is hampered by a series of permits, levies, taxes, and other artificially created trade restrictions. These barriers result in delays in the normal flow of food grains within the state, creates artificial price situations, increases the cost of marketing considerably, and provides a broad area in which corruption and malpractices take place. These barriers should be eliminated insofar as possible so that the marketing system can operate more rationally.

Market Information

Market information to be of value must be timely, accurate, and reliable. It must promptly get into the hands of those who can use it.

The present market information available to the trading sector and to producers on prices of food grains, the crop outlook, and stocks in the marketing channel and storage is inadequate. It is not likely to improve until there are significant changes in the procedures for the collection and dissemination of such information.

Presently, information on changing market conditions is obtained by traders primarily through personal contact with their counterparts in other markets. This is usually done by writing numerous postcards to the traders in various markets, through telephone conversations, and telegrams. Traders in the primary markets usually obtain crop outlook information in their region by visiting cultivators residing in the outlying villages.

Newspapers constitute the major source of information for obtaining an overall view of the crop conditions in the various parts of the country and for acquiring a feel for the constantly changing government policies towards trade. Almost all the traders interviewed emphasized the importance of newspapers in providing such information.

Very few traders attached much importance to the radio as a channel of market intelligence. This is probably because of the kind and amount of market information being provided. Actually, a greatly expanded network of radio, and eventually television, coverage is required to improve the market information function. The distribution of four million transistor radio sets in Tamil Nadu during the next decade would be a realistic goal and would go a long way toward closing the communication gap. The task of improving

market communication is largely a problem of applying science and technology, of matching them with innovations in organization and procedures, and of selecting the course that promises to make the most significant contribution to an effective market information program.

The present system of reporting market prices and crop and livestock estimates needs overhauling. Price reporting of all major agricultural crops needs to be expanded to give broader coverage and at the same time provide a greater degree of accuracy. Prices of food grains in the open market as well as the government procurement price should be reported daily during the marketing season for the principal crops. Reliable data series on prices, supplies, and marketings need to be developed. Better trained personnel in price reporting work, in collecting information on stocks, and in estimating crop and livestock parameters is a necessity before much improvement can be expected. Also, a general awareness of the need for market information by the trading sector and by farmers must be recognized. Finally, the collection and tabulation of an appropriate body of statistics on marketing is an essential aspect and provides the basic information relating to many policy choices that will be required as the process of development evolves.

Standardization and Grading

Standardization gives permanence to grades by establishing the basic limits into which agricultural produce can be placed. Grading sorts the produce in homogeneous units on the basis of quality as determined by such general characteristics as maturity, size, color, age, translucency, and fragrance and by special characteristics such as the moisture content of the grain and the proportion of foreign matter, broken grains, damaged grains, and weevilled grains.

Very little progress has been made in Tamil Nadu in grading food grains at the village level. Paddy (rice), for instance, is classified into superfine, fine, medium, and coarse (bold) classifications. These are equivalent to the first sort (superfine and fine), second sort (medium), and third sort (coarse) groups on which price quotations are given. The basis for these classifications or groups is the variety of paddy (rice).²³ Essentially, no grading is done within these sorts. It is within these sorts that more objective procedures that can be implemented rapidly need to be developed and put into practice. Reliable grades and standards would eliminate the need to inspect everything

²³ A Madras Government notification that announced fixation of maximum paddy and rice prices for 1966 lists 38 specific varieties of Madras origin under fine quality, 22 in medium, and 27 in coarse in addition to which a number of other local varieties are mentioned but not specified.

that is brought and sold. These, with full and widely available marketing information based on grades, and reasonable market regulations are important features of an improved marketing system.

An effective grading system would stimulate production of better quality. It also helps maintain quality as the product moves through the marketing system. Grades must be applied uniformly without favor to buyer or seller and the price differential between grades should be great enough to encourage the producer to sell his products on a graded basis.

Grading facilitates financing, especially for products of the highest quality. Grading is also essential to any marketing program that involves bulk storage methods for handling food grains. Weights, scales, and measures should be standardized and regularly inspected so that the traders will not manipulate them against the farmer.

In the final analysis, the goal for grading all food grains should be the establishment of simple, enforceable, official grade standards to permit description sales supplemented by a system of licensed official weighers for quantity determinations. Along with this should be provided a mechanism for settlement of contract disputes between buyers and sellers that will avoid the delays and expenses inherent in actions at law and before the courts.

Research and Education

Before many improvements and developments in the marketing system can take place there must be significant research to guide, direct, and support those improvements and developments. This research must necessarily range from studies of market structures and institutions, to food processing, to the engineering of storage and transport, and to business management.²⁴ Some of this research can be undertaken in the Agricultural Colleges and Universities²⁵ but more of it will be done in schools of Business, Engineering Colleges and Institutes, and in private firms. But it must be done, and the State government in collaboration with the Central government must see that it is done, because the marketing system cannot be modernized without a base of organized, scientific knowledge, and for the most part that base of knowledge does not now exist.

²⁴ *Ibid*, pp. 34-35.

²⁵ A good example of the kind of research that should be done by the agricultural colleges and universities is: Gill, K. S., *Wheat Market Behaviour in Punjab, Post-Harvest Period, 1968-69*, Department of Economics and Sociology, Punjab Agricultural University, Ludhiana, 1969.

Examples of the kind of marketing research projects that should be initiated to support improvements and developments in the marketing system follow.

1. Study the structural changes needed in agricultural marketing institutions that will enable them to assume their role in agricultural development more effectively.
2. Study the physical aspects of marketing through a series of studies relating costs to (a) preparation of products for marketing, (b) the process of handling and transportation, (c) type and location of storage, (d) methods of processing, (e) the nature of packaging, and (f) methods of distribution. All studies relating to the physical aspects of marketing must ultimately be done in terms of the efficiency of the entire structure.
3. Estimate the marketable surplus of the different food grains for the next decade by states.
4. Study the development of appropriate standards to facilitate the marketing process involving such factors as inspection, certification, identification, and the class and quality of products moving through the marketing channel.
5. Study costs and related benefits of alternative investments for improving marketing efficiency.
6. Study the possibility of developing new and expanded markets for products manufactured from food grains.
7. Study the effects of artificial trade barriers on movement of food grains between and within states.
8. Study new methods for the collection and dissemination of appropriate market information to guide the production and marketing process from producer to consumer.
9. Study methods and patterns of financing and risk-taking in marketing operations at various levels in the marketing channel.
10. Study the seasonal price variations and price trends of the food grains and the factors influencing price changes.
11. Study and identify potential market service centers in the surplus production areas. Proceeding from these studies, a series of economic, social, and engineering studies should be undertaken so that a pattern of roads could be synthesized that would service the needs of such emerging rural communities.

12. Study the comparative efficiencies of different marketing institutions such as the private traders, cooperative societies, regulated markets, and the Food Corporation of India with emphasis on storage, transportation, grading, finance, processing, and so on.
13. Study improved methods of handling food grains such as (a) bulk handling and storage versus the customary burlap bags and flat warehouse storage, (b) substitution of bullock cart transport by motor transport, and (c) capital intensive versus labor intensive methods for handling food grains.
14. Develop government incentive programs for producers to build storage structures.
15. Study the location, design, layout, and storage aspects of new market facilities and of old markets relocated in the context of indigenous materials, availability of simple equipment, capital requirements, and the labor situation.
16. Study the impact of government procurement programs on price of food grains at both producer and consumer levels.
17. Study the need for processing facilities for food grains in terms of supplies available, consumer demand for processed foods, price relationships, and methods of operation adaptable to small scale processing industries.
18. Study economics of scale of institutions serving the marketing sector, for example, the rice mills and storage facilities.
19. Study the development of or restructuring of appropriate governmental organizations which can facilitate the evolution of an efficient market system within the general strategy of marketing development.
20. Assess the potential for the use of new crops such as hybrid maize and soybeans in terms of (a) what the new crop means to the economy, (b) present uses being made of the crop, (c) price relationships necessary to divert uses from local consumption to industrial processing, and (d) the means required to get consumption increased for new products.

One of the major problems limiting research on marketing issues like those listed is the critical shortage of professional personnel seriously engaged in research. There is also a lack of understanding of marketing in the larger dimension and its intimate and crucial role in the development process.

A general awareness, concern, and understanding of the meaning of marketing and its role in the economy must be created among those engaged in marketing work and among policy makers at the state and central government level.

To overcome this scientific manpower shortage, it would be possible to recruit talented individuals from related fields and that a program of retraining for work in marketing be initiated at the agricultural colleges and universities. There should be established on a high priority basis formal research and graduate training centers for training key marketing personnel. Service programs which do not now exist should be initiated to strengthen the talents of those presently engaged in marketing activities.

The marketing research, regulatory, and service programs of the central and state governments should be thoroughly reviewed in terms of the problems that will be created if the projected increases in food production occur. If the marketing issues are faced honestly and in correct perspective, a greater commitment of financial resources will have to be made for training marketing personnel and financing research.

To focus attention directly on the magnitude of the marketing problem, consideration should be given to the merits of organizing, first, national, and second, regional and state marketing workshops or conferences that would call attention to the need for new efforts in marketing.²⁰ Economists, food technologists, engineers, and others expressing interest in marketing should be invited to attend such workshops which might be scheduled annually for the next five years. Such workshops could be instrumental in helping retrain scientists in related fields in becoming quite proficient as marketing professionals.

V. CONCLUSION

Most of what has been said in this report has been said before. In many cases the arguments are intertwined with the social and political environment complex in which their adaptations must take place. And most of the program elements stressed in modernizing the marketing system have been cast in the existing setting in order to place the institutional changes that must be made in their proper perspective, and this is certainly nothing new.

The central theme that runs throughout the entire report is one of organization — a problem of obtaining organizational efficiency. Institutional changes that must be made must be deep and far reaching and organizations thus established must perform efficiently and effectively. The transformation must be accomplished with great administrative skill and understanding.

²⁰ Kiehl, Elmer, *Op. cit.*, p. 10.

Archaic marketing facilities, inadequate standards, poorly conceived pricing policies, and inadequate food preserving operations contribute to food deficiencies no less than antiquated farming methods. So, in the last analysis, this report is a plea to put politics aside when making important marketing decisions, to ignore dogma and form in the setting up of new market institutions, and to concentrate first on setting forth clearly and boldly, by stages if necessary, the changes that are required to modernize the present market structure and second to build the capability in the responsible organization for making the changes deemed desirable.

To those who read this report, it is hoped that a greater awareness and concern is created in their minds about the urgent need for modernizing the market system and that they will support research and educational programs aimed at accomplishing this goal.