Chapter 7

Conclusion

The present study analyses the movement of agricultural prices in India in the post liberalisation period, during last two decades from 1992-93 to 2009-10. It identifies the factors responsible for the movement and attempts to assess their roles. The study, however, focuses on supply side factors, i.e., factors which affect the cost of production. Agricultural commodities being necessary commodities have almost stagnant demand; it explains little of the fluctuations in the agricultural price level. In very short run, crop prices depend on climatic conditions, but within a considerably long horizon agricultural prices must depend on input prices which determine the cost of production. The study therefore concentrates on input prices in the farm sector.

Inputs in agricultural production are of two categories, viz., variable and fixed. Accordingly, cost of production should also have two components. Variable cost arises due to variable factors such as fertiliser, water and labour. Fixed cost, on the other hand, refers broadly to the cost of land and machines. The study considers major variable and fixed cost components in agriculture and estimates their influence on agricultural prices. The standard time series techniques have been used for the purpose and the study period has ranged from early nineties to the first decade of this century.

Chapter 2 discusses the movement of agricultural prices and its different components in India for the period from 1992-93 to 2009-10. Different experts have analysed agricultural prices and have provided different explanations. A survey of these studies
has been made in this chapter. A large number of these studies hold the view that input prices determine agricultural prices.

Our investigation is constrained by availability of data. Due to non availability of information, short term price behavior could not be probed, which mainly depends on factors such as climatic conditions or hoarding. The study rather concentrates on investigating the long run factors which govern the movement of the agricultural price level.

Fertiliser is an important input in agriculture and its importance has increased over time with the use of HYV seeds in India (chapter 3). The influence of fertiliser cost on agricultural prices has been investigated with the use of time series econometric techniques. Since both agricultural price and fertiliser price are stationary at first differences, cointegration test has been conducted between them. However, it is puzzling to observe that our investigation reveals no cointegration- implying that there is no long run equilibrium relationship between fertiliser price and agricultural price. Absence of cointegration weakens the causality exercise. Still, for checking short run interdependence between the variables VAR modelling has been done. However, the estimated VAR model along with the relevant F-tests fails to identify strong causality running from either direction.

The study has further been extended to the crop-specific levels. As a matter of fact, fertiliser intensity varies from one crop to another. Crops like wheat, cotton, sugarcane or rice are fertiliser intensive crops as they require more fertiliser than fertiliser non-
intensive crops like maize, jowar or bajra. The study examines if the influence of fertiliser price is different on these two categories of crops or in other words, if fertiliser price affects prices of fertiliser intensive crops. Wheat has been taken as the fertiliser intensive crop and maize as the fertiliser non-intensive crop. However, causality is not evident in either case. The Indian experience is in sharp contrast with developed countries.

Findings of similar investigation carried for the United States reveals causality between fertiliser price and agricultural prices, especially the one running from the former to the latter. The result is striking and suggests us to find out reasonable justification behind the difference in results between the two countries. The finding may be attributed to two factors. First, in spite of the so-called “green revolution” and modernization, fertiliser use in Indian agriculture has still remained very low. Farmers used an average of 133.2 kgs of fertiliser per hectare in 2007 while fertiliser intensity in China in the same period was 304.7 kgs / hectare and that in North America was 195 kgs / hectare (source : Food and Agriculture Organization (FAO) of the United Nations, FAOSTAT). Fertiliser cost is roughly 10% of the total cost of agricultural production in India. For some of the crops, the percentage is even lower. Changes in the fertiliser price therefore do not significantly affect the total cost of production. In countries like United States, on the contrary, fertiliser is a major cost component in agriculture. In USA, almost 50 % of the cost of wheat production was due to fertiliser in the year 2009.
A second explanation lies in the fact that fertiliser price is not market determined in our country. Fertiliser is highly subsidized and the volume of subsidy went on increasing to keep pace with the hike in the prices of ingredients. As a result, fertiliser prices remained relatively stagnant and increased very slowly. During the period from 1994-95 to 2008-09 prices of the major ingredients like naptha, furnace oil or phosphate rock increased many times but fertiliser price just less than doubled (Table 1). Naptha price index, for instance, increased from the level of 100 to 766.2 while in the same period fertiliser price index rose from the level of 121.5 to 196.5. It was due to increased subsidy to the sector. Government increased the volume of subsidy in order to contain fertiliser prices.

The insensitivity of crop prices to fertiliser prices has important policy implications. Fertiliser subsidy is necessarily beneficial to the farmers as it reduces cost of production and increases the profit margin. Subsidization of fertiliser has therefore been pursued in many countries around the world with the aim of boosting the agricultural sector. However, the reduction in the cost of production might not lead to downward price adjustment. Fertiliser policy, for that reason, cannot be treated as part of agricultural prices policies. Crop prices, it seems, are determined by other cost components like wage or irrigation and/or they may be guided by the dynamics of demand. Fertiliser price and agriculture price are only remotely related in India.

We observe a different story in the field of irrigation expenditure. The picture is in sharp contrast with fertilizer use – low intensity of use and administrative support are the major explanation. The role of irrigation in agriculture is increasing, consequently the influence
of irrigation cost on the prices of agricultural crops. The cost of irrigation is proxied by the prices of diesel and electricity, the major inputs in the process of irrigation. Empirical findings show, however, that agricultural prices are affected by electricity prices but not by diesel prices. A cointegrated relationship exists between electricity price and the agricultural price. However, Similar evidence is absent in case of diesel. Possibly it is due to the fact that farmers prefer and using more and more electricity runs irrigation devices in the country compared to diesel driven ones. Further, the Vector Error Correction Model shows that the causality runs from electricity price to the agricultural price.

A crop-specific analysis has followed the overall level study. In the crop-specific analysis, price of electricity has been taken to be representative of the irrigation cost. The influence of irrigation cost on price of any crop depends on the use intensity of irrigated water. For that reason major crops are divided into two categories, viz., irrigation intensive crops and irrigation non-intensive crops. It is defined that irrigation intensive crops are those for which more than 50% of area is under irrigation and crops that use less than 50% of irrigated area are considered as irrigation non-intensive crops. Crops like sugarcane, rapeseed, wheat and rice are irrigation intensive crops while groundnut, maize, jowar, pulses, cotton, and bajra are considered as irrigation non-intensive crops. The irrigation cost should influence more the prices of irrigation intensive crops than irrigation non-intensive crops. For the empirical analysis sugarcane has been chosen as the irrigation intensive crop and maize as the irrigation non-intensive crop. Results show that electricity price influences the price of sugarcane but does not show any causal
relationship with the price of maize. Hence, the causality between irrigation cost and the price movement of agricultural crops depends on the use intensity of irrigated water.

Labour is an important input in agriculture and wage constitutes more than 40% of total cost in agricultural production. The study therefore examines whether wage cost governs agricultural prices. Three types of data are available on wage rate, viz. wage for male, women and children. In the agricultural sector, male workers dominate the profession. The male wage rate has therefore been taken as the representative wage rate for the sector. The causal relationship between male wage rate and agricultural prices has been examined with the use of same econometric techniques. The empirical work traces bi-directional causality between male wage rate and agricultural prices.

The study addresses the vital question of uniformity of wage cost across the crops - whether the influence of wage cost is uniform for all crops. It should depend on the weightage of wage cost in total production cost. The present study therefore divides crops into two categories - wage intensive and wage non-intensive. Wage intensive crops are those for which the percentage of wage cost to total production cost is more than 45% and less than 45% indicates the wage non-intensive crops. Crops like rice, maize, bajra and jowar are considered as wage intensive crops while cotton, rapeseed, groundnut, wheat, pulse and sugarcane are wage non-intensive crops. Wage cost should influence more the prices of wage intensive crops than those of non-intensive crops. To examine this comparison we considered maize from wage intensive category and wheat from wage non-intensive category. Tests for cointegration show that wage rate is cointegrated with
both wheat and maize prices. In addition, the VECM indicates the direction of causality: the causality runs from either direction.

The fixed inputs in agriculture measures the major fixed cost components. Usually fixed cost constitutes more than 50% of the agricultural production cost. For paddy, for instance, it is 66% of the total cost of production. Broadly, land and machines are the major fixed inputs in agriculture. The cost of land is measured by rental value of own land, rent paid for leased-in land, ‘land revenue, cesses & taxes’ and the cost of machines by depreciation. However, long period data on fixed costs and its components could not be availed. The usual time series techniques and the causality exercise could not be run for that reason. The study therefore has relied upon descriptive statistics for examining the association between fixed cost and agricultural prices. The relationship has been explored for two crops, viz., paddy and wheat. The correlation coefficient between fixed cost and crop price is noticeably high for both the crops.

Overall, the study finds strong evidence in support of the view that agricultural prices are largely dependent on input prices which constitute the cost of production. Both variable costs and fixed costs determine the level of agricultural prices in the country. Although fertiliser price does not influence crop prices, other input prices do. Agricultural prices depend, for instance, on the prices of electricity and labour. Fixed costs also seem to guide the prices of crops.