
**LIKELY IMPACT OF LIBERALISED IMPORTS AND LOW
TARIFFS ON EDIBLE OIL SECTOR IN INDIA
(A QUICK SURVEY OF SOYBEAN IN MAHARASHTRA)**

Executive Summary

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Introduction

The process of liberalisation that was initiated in early 1990s is seen to have started affecting various sub-sectors within the Indian economy. The phenomenon is expected to affect the agricultural sector through inflow (imports) of inputs/products and through the possibilities of exports. The increasing dependence on markets in an open economy framework, through the channel of trade liberalisation as the essential feature of the process, would have impact at the micro and macro level. At the macro level the net benefits to the agricultural sector through imports and exports needs to be studied. At the micro level, response of the farmers to the changing situation, their adaptability and response in terms of area, cropping pattern, and the accompanying changes in cost of cultivation, incomes and profitability assume importance. The decisions of the farmers in this regard would affect allocation of resources and pricing in output and input markets.

For the edible oil sector in India, trade liberalisation assumes importance due to the complete reversal of the policy governing trade of the same. Till 1994, imports of oilseeds and edible oil were canalised through State Trading Corporation and were distributed through the public distribution system. Import restrictions and various programmes for increasing area under and production of traditional and non-traditional oilseeds during late 1980s made India nearly self sufficient though at the cost of high oil prices for the consumers of edible oils. However, with the initiation of India's own programme of economic liberalisation and the Uruguay Round Agreement, major policy decision relating to edible oils was taken. These were put under open general license and the duty was lowered from 65 percent to 15 percent over a period of four years- from 1994 to 1998. Consequently, imports increased to the benefit of the consumers. In the mid 1990s, imports reached their lowest level and thereafter started increasing again. On the whole, with opening up of trade, the imports of edible oils have started increasing. The share of imports, which was around 4 percent in early 1990s, has gone up to around 30 percent of the total available oil, as in the late nineties.

As an impact of liberalisation (and removal of protection) on oilseed growers and oil processors, the ceiling put on the domestic prices (because of the imported oil) can have dampening effect on prices of oilseeds and margins of processors. This might make the oilseed crop unremunerative and may manifest in falling area under the crop. At the macro level, impact of a fall in the prices of edible oils (due to imports) leading to that in oilseeds has to be analysed in terms of the overall impact of trade liberalisation on the agricultural sector. The extent of net gains would depend upon intra sector changes such as those in cropping pattern and extent of exports and imports and would determine gains/ losses of the cultivators vis-a-vis that of the consumers. At the micro level, however, it cannot be denied that the edible oils being substitutes of each other for the consumers, increasing imports may affect prices of the oilseeds and hence incomes and profits of the cultivators adversely. This again might lead to changes in the decisions of the farmers relating to cropping pattern if the existing cropping pattern is no more profitable. Fear has been expressed that increasing dependence on imports/international markets for edible oil might be risky if the prices fluctuate violently. Therefore, assessment of impact, if any, of trade liberalisation on the edible oil sector becomes necessary.

Soybean Sector in India: Expansion and Importance

Oilseeds occupy an important position in terms of area, production and the growth rates of the same among the agricultural commodities. At the national level, the area under oilseeds is growing at the rate of 2.9 percent and production at the rate of 5.9 percent since 1986-87. The increasing area and production of the oilseeds indicates increasing importance of oils in the consumption basket of the population.

Among the total oilseed crops, thirty year old non-conventional soybean crop expanded in terms of area and production at quite a fast rate in absolute as well as relative terms after mid 1980s and came to occupy an important place in the cropping pattern at all India level. In 1998-99, 23.6 percent of the total area under oilseeds was under soybean and 28 percent of the total production of oilseeds, was contributed by soybean. The important position of soybean in the cropping pattern consequently gets reflected in

the production of soybean oil, which increased by more than 2000 percent during 1981-82 to 1997-98. Moreover, soybean oil is a major input to the vanaspati industry. Share of soybean oil as an input to the vanaspati production is the highest among all other oils. Next, soybean is one of the important contributors to the gross national product through the exports of soybean cake/ meal, which accounts for more than 50 percent of the quantity and value of total exports of oil cake/meal and is increasing over the period at a very fast rate. It is quite clear that increasing flow of resources had been being directed towards this sector. Rising importance of the produce also hints at its profitability and gains to the producers.

Need for the Study

In the light of potential for increasing consumption /usage of soybean and its products occupy in the consumption basket, it is necessary to analyse whether the process of trade liberalisation and tariff reduction has had any impact upon the current status of soybean sector in India. Adverse impact, if any, of trade liberalisation would mean falling area under and production of soybean. As a consequence of this, the operations of the processing industry and the sale of the final products would be hampered. This would obviously affect the employment of resources and income generation in this sector. Specifically to note is its effect on small farmers in soybean cultivation who are unorganised (as against the processing units and exporters) and depend largely on vagaries of nature for the production. A declining demand for soybean would affect the demand and employment of labour. Maharashtra is the state, second in the rank after Madhya Pradesh as far as area under and production of soybean is concerned. It would be interesting to study the impact of trade liberalisation on soybean economy of the state.

Objectives of the Study

The major objectives of the study are as follows-

1. To assess the changes in the cropping pattern and
2. To assess the impact on farmers' income due to decrease in production and prices of oilseeds.

These objectives envisage firstly, the analysis of changes in area, production and yield of soybean in the post reform period as compared to the pre-reform period at the state level; secondly, the analysis of impact of reduced tariffs and cheap imports of edible oils on soybean prices in the domestic market and thirdly, understanding the impact of trade liberalisation on the cropping pattern, income, profitability and employment in the case of soybean cultivators in the villages of Maharashtra.

Methodology of the Study and the Limitations

The study utilises secondary as well as primary data. In the former case, major focus was on analysing the changes firstly in area, production and yield of soybean in the pre and post reform period and secondly in the prices of edible oil – domestic and imported during the liberalisation period. An attempt has been made to relate the latter to the former to understand, if the existing cropping pattern was changing. In the case of primary data, again, the trends in area, production, productivity and labour use in case of soybean and the competing crops were noted. This was related to the relative profitability of the crops cultivated by the sample households. For this exercise, for each crop of the household, various indicators of profitability were calculated and the extent and the direction of change in the same over the survey period were noted. Lastly, the perceptions of the respondent households on the likely impact of trade liberalisation were recorded. For understanding the current position and opinions of the soybean processing units regarding trade liberalisation, their responses were also analysed.

For analysing the impact of trade liberalisation at the micro-level, as per the guidelines of the coordinating centre, districts with soybean as the major crop had to be selected. On the basis of absolute area under soybean and share of area under soybean to

gross cropped area, district Nagpur was selected. Using the same criteria two talukas - Umred and Narkhed were selected. Within each taluka, three villages were chosen.

Twenty sample households were selected randomly in each village stratified by the size of landholding, thus making the total number of households 60 for each taluka. The survey was conducted during January and February 2000 and the data was collected for three years from 1998-99 to 2000-01.

Soybean Cultivation in Maharashtra

The growing importance of oilseed cultivation in Maharashtra's agriculture is clear from the increasing trend in area under oilseeds which was 1454 ha in 1960-61 and 2674 ha in 1998-99, thus registering an increase of 84 percent. The production has grown nearly three times registering an increase of 363 percent over a period of forty years. Till mid 1980s, areawise, the major oilseed in Maharashtra was groundnut. However, since mid 1980s, farmers have started cultivating non-conventional oilseeds, specifically soybean and the area under this crop is picking up at a high pace. Its contribution to total area and production of kharif and rabi oilseeds is seen to be highest in absolute terms in the year 1998-99.

Shorter duration, easy cultivation and harvesting, benefits in terms of improvement in fertility prompted farmers to undertake soybean cultivation primarily in the north east region of the state where the climatic conditions were also suitable for soybean cultivation. The shorter duration of the crop allows the cultivators to take the second crop on the same piece of land and add to their income/profits, which is not possible for kharif crop like cotton.

A comparison of area and production of soybean in Maharashtra and Madhya Pradesh shows that Maharashtra lags behind as far as the absolute values are concerned. However, the striking point to be noted is declining trend in area and production in Madhya Pradesh, as against that of Maharashtra. The percentage of area under and production of soybean in Maharashtra to that of Madhya Pradesh is rising over the period.

Changing Tariff Structure and the Performance of Soybean in Maharashtra

According to the economic theory, prices through their effect on relative profitability play important role in farmers' decisions relating to allocation of land. With changes in relative prices, of inputs and output, farmers would respond by adjusting cropping pattern to maximise their benefit. Cheaper imports due to lower tariffs can affect the domestic prices adversely if the price of imported good including the tax rate and other costs are less than the domestic prices, thus setting a ceiling for the latter to rise. The level at which domestic prices get settled would also depend upon the external factors like weather conditions and demand for the crop especially at the international level. Hence it is expected that increasing imports of cheap edible oil (that competes with the domestic oil) in the country would reduce relative price and profitability of soybean cultivation through the impact on demand for soybeans. At the state level, the impact can be observed by relating the cropping pattern changes to the relative prices.

An attempt was made to understand the impact of reduced tariff rates on the soybean prices of Maharashtra and in turn its effect on the area under soybean. The effective (i.e. after tax) price of imported edible oil was compared with the price of soybean prevailing in Maharashtra in the post liberalisation period. It was observed that the latter was lower than the former in the earlier phase of tariff reduction. However, with increasing imports of edible oil, tariff rates increased. Domestic oil prices were found to be higher than the former in this latter phase of tariff hikes. It was also noted that the prices of soybean remained stable as compared to that of oil in the post reform period especially in the late nineties. Similarly, the area under and production of soybean during this particular period did not show any declining trend. Even with the assumption that prices as one of the explanatory factors affecting area under cultivation with a lag, (i.e. here, a few years after the steps for liberalisation and tariff reduction were taken in 1994-95), such a trend is not observed in case of Maharashtra. This indicates relative profitability of soybean cultivation in the post liberalisation period too. The secondary data shows that at the macro level, i.e. at the state level, area and production have been

rising continuously in Maharashtra and hence apparently, cheaper imports of edible oils do not seem to have affected the same. There is a possibility that the rise in the area and production (though at a slower pace) of soybean without being affected by prices is due to a few factors. Firstly, the rate of increase in the area and production in case of Maharashtra is higher than that in Madhya Pradesh where in fact the data shows a marginal decline in both in the recent years. Secondly, in absolute terms, the area and production in Maharashtra are around only one fourth that of Madhya Pradesh; the oil/cake producing capacity is also less in Maharashtra. Thus, this means that Madhya Pradesh contributes bulk of the supply of soybean and Maharashtra contributes only a small percentage to total soybean supplied. It might be the case that with increasing demand for oil (as the NCAER estimates show), increasing import duties in the recent past years and marginally declining area and production in Madhya Pradesh is compensated by increasing area and production in Maharashtra.

Profitability of Soybean Cultivation in the Changing Scenario: Analysis of the Survey Results

The field level information collected was analysed with the objective of understanding the impact, if any, of trade liberalisation on the soybean cultivation at the village level. The information was analysed firstly on the basis of trends in area, production and productivity of soybean and secondly by calculating the relative profitability of soybean cultivation and changes observed in the same during the study period. Thirdly, the opinions of the respondent households and the processing units were also analysed. The major points that were noted are as follows-

The two selected talukas were heterogeneous regions in terms of broad features of the agricultural sector. The three-year data collected presented two different pictures of economics of soybean cultivation in the two talukas. Constant/increasing area under soybean and its increasing profitability in Umred is attributed to good monsoon in this region vis-à-vis other regions. Soybean cultivation was clearly seen to be profitable due to its shorter duration and lesser costs in terms of irrigation, application of fertilisers, insecticides/pesticides, supervision etc. Majority of the respondents

expressed the opinion that soybean prices were rising in recent years and that the area under the crop would be maintained. Narkhed presents a different picture. Though majority of the households maintained that soybean prices were rising, they were concerned about the crop failures and declining trend in production in recent years. Thus, the households were not able to recover the costs from the income received from soybean cultivation. The net return was seen to be negative for many households. At the aggregate level, the variables clearly indicate profitability position of soybean. The indicators convey positive sign and show increase over the survey period. Taluka Umred thus dominantly affects the aggregate profitability figures

- The likely impact of trade liberalisation is expected to be captured in terms of declining trend in edible oil prices and adverse effect on soybean cultivation. However, the indicators reveal adverse impact of seasonal factors rather than of trade liberalisation through market. Prices of imported edible oil (through their impact on demand for soybeans) did not seem to have affected prices of soybeans and its relative profitability in both the talukas.
- The data on the processing units, though limited, revealed some interesting points. Though the units were experiencing high input (seed) costs and fluctuating /falling output (oil) prices, the output and the income from sale was seen to be growing at a fast rate.

On the whole the falling prices of edible oil and the adverse impact of the same seems to be compensated by growing derived demand for soybean. The exercise with the primary data indicates that the prices of soybean are maintained / increasing as the supply falls short of the increasing demand.

Thus, the available data does not clearly show any adverse impact of trade liberalisation on soybean cultivation Maharashtra. The second phase of trade liberalisation is characterised by increasing tariffs on edible oil with the duty on edible oil reaching its limit (the bound rate of 45 percent) as per WTO regulations. Hence, given the comparatively higher rates of tariffs, any change in the price of imported edible oil would depend upon domestic and external factors.

At all India level, impact of liberalisation of trade in edible oil is revealed through increasing imports of edible oil and falling prices of domestic edible oil. However, the initial phase of tariff reduction is over and the tariff rates have been increasing again. This second phase of trade liberalisation is characterised by increasing tariffs on edible oil with the duty on edible oil reaching its limit (the bound rate of 45 percent) as per WTO regulations. For Maharashtra, the available data does not clearly show any adverse impact of trade liberalisation as well as tariff reduction on soybean cultivation in Maharashtra. Given the comparatively higher rates of tariffs, any change in the price of imported edible oil would depend upon domestic and external factors.

However, it can be said that over a period of time, depending upon various external demand and supply factors, Maharashtra might experience a decline in area in future, if import duties on soy oil / palm oil are reduced further, given the other things. In such a case, incomes of the cultivators and agricultural labourers might be badly hit.

Policy Implications

It is observed that the profitability of soybean cultivation in the sample talukas depends on the market signals of demand and supply which are also governed by the seasonal factors. With the tariff rates on imported edible oils already increasing in the second phase of reforms, there may not be further scope for rise in the same. In these circumstances, for Maharashtra, increasing production of soybean remains the major issue. This can be achieved by –

- Increasing yield of soybean through better technology of production. This assumes importance as expansion in area under soybean may not be feasible at the macro level. Ensuring adequate and good quality soybean would help the processing units in utilising excess capacity and compete with the imported oil.
- Provision of irrigation facilities so that the farmers do not have to depend on the vagaries of nature.
- Provision of marketing support so that the farmers avail of better prices for their produce.

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PREFACE

The study on "Likely Impact of Trade Liberalisation on Soybean Sector in Maharashtra" was conducted by the Agro-Economic Research Centre of Gokhale Institute of Politics and Economics.

In recent past years, the importance of soybean in the total oilseeds as well as in the cropping pattern as a whole has been growing at a fast rate. Area under soybean expanded rapidly in 1980s due to its relative profitability. However fear has expressed that with the initiation of the process of trade liberalisation and tariff reduction, the inflow of cheap imported edible oil would hamper the profitability position of soybean. This might therefore lead to changes in the cropping pattern and affect the inflow of resources engaged in this sector and the income generated therefrom. Maharashtra is the second largest state as far as area and production of soybean is concerned. An attempt has been made in this study to analyse the impact of trade liberalisation through prices on area and production and the profitability of soybean using both secondary as well as field level data collected from Maharashtra state.

The study could be completed mainly due to the co-operation rendered to me by many, at the Institute. I would like to thank Prof. V. S. Chitre the Director, for providing the necessary infrastructure. I am also grateful to Dr. K. G. Kshirsagar, Officer-in-charge, Agro-Economic Research Centre for providing necessary guidelines and valuable suggestions. I take this opportunity to thank all my colleagues, who provided necessary help to me, whenever required. From the discussions with Shri Shantilal Lunkad, Nav Maharashtra Chakan Oil Mills Ltd., Pune, I gained valuable insights into the subject. My sincere thanks to him. I also thank the authorities at the Directorate of Oilseeds Research, Hyderabad, Solvent Extraction Association, Mumbai, for promptly providing me the literature on the subject. I also wish to thank all the government officials who extended their co-operation to our field investigators.

Shri Dethé, Shri Karpe, Shri Kasbe and Shri Lokare conducted the field survey. My sincere thanks to them for their hard work. I also thank Ms Archana Deth and Mrs. Aarti Jadhav for providing neat statistical and typing assistance.

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CHAPTER I

TRADE LIBERALISATION AND THE EDIBLE OIL SECTOR IN INDIA: AN OVERVIEW

1.1 Introduction

Agricultural sector in India, after the phase of green revolution, is again witnessing major policy changes under the environment of liberalisation and globalisation. Whereas major objective of the former was achieving food security, the latter is expected to make the sector globally competitive by improving the efficiency of inputs, units and processes by way of providing a more free environment for their operation. The implications of these policy measures and their impact on various sections of the society has remained a debatable issue. Results of the research works studying the effect of liberalisation and globalisation are rather mixed. The process of liberalisation that was initiated in early 1990s is seen to have started affecting various sub-sectors within the Indian economy. The phenomenon is expected to affect the agricultural sector through inflow (imports) of inputs/products and through the possibilities of exports. The increasing dependence on markets in an open economy framework through the channel of trade liberalisation, as the essential feature of the process, would have impact at the macro and micro level. At the macro level the net benefits to the agricultural sector through imports and exports needs to be studied. At the micro level, response of the farmers to the changing situation, their adaptability and response in terms of area, cropping pattern, and the accompanying changes in cost of cultivation, incomes and profitability assume importance. The decisions of the farmers in this regard would affect allocation of resources and pricing in output and input markets.

1.2 Trade Policy Changes and the Edible Oil Sector in India

Liberalisation of edible oil imports assumes importance due to the complete reversal of the policy governing trade of the same. Till 1994, imports of oilseeds and edible oil were canalised through the State Trading Corporation (STC) and were distributed through the public distribution system (PDS). Imports of oilcakes were also restricted. Exports of oils, oilseeds were banned, however those of oil meal/cake

were kept free. Rising demand of edible oils during the 1970s and strain on the balance of payments (BOP) due to the heavy imports of the edible oils led the government to take steps towards self sufficiency in edible oils. Import restrictions and various programmes for increasing area and production under traditional and non-traditional oilseeds during late 1980s made India nearly self sufficient though at the cost of high oil prices for the consumers of edible oils. The subsequent policy changes were directed towards increasing the protection to the edible oil through increasing tariffs. Throughout 1980s domestic prices were maintained at more than double the international prices (except soybean). Thus, oilseed growers derived protection through that given to the edible oils. The area under oilseeds expanded indiscriminately and the cultivators received high prices often 20-30 percent higher than the minimum support price (MSP) (GOI, 2000a). However, with the initiation of India's own programme of economic liberalisation and the Uruguay Round Agreement, major policy decision relating to edible oils was taken. These were put under open general license (OGL) and the duty was lowered from 65 percent to 15 percent over a period of four years- from 1994 to 1998 (Appendix 1.1). Consequently, imports increased to the benefit of the consumers (Table 1.1). In the mid 1990s, imports reached their lowest level and thereafter started increasing again.

Table 1.1: Availability of Edible Oils in India (In million tonnes)

Year	Domestic Production	Imports	Total
1991-92	6.49	0.34	6.83
1992-93	6.81	0.20	7.01
1993-94	6.93	0.33	7.26
1994-95	7.19	1.00	8.19
1995-96	7.22	1.40	8.62
1996-97	7.42	1.75	9.17
1997-98	6.79	2.08	8.87
1998-99(E)	7.37	3.00	10.37

Source: The Economic Times, June 1, 1999 as quoted in Singh and Asokan (1999)

As prices of RBD Palmolein increased in the international markets in July 1998, STC was given the flexibility to import other oils also. Due to these imports, prices of edible oils in open markets drastically came down in the first quarter of the financial year 1999-00 and oil in open market was available at cheaper rates than PDS

retail prices (GOI, 2000b). With the introduction of duty differential by the government since January 2000, import of oil, particularly raw oil has increased.

On the whole, with opening up of trade, the imports of edible oils have started increasing. The share of imports which was around 4 percent in early 1990s has gone upto around 30 percent in total available oil, as in the late nineties.

As an impact of liberalisation (and removal of protection) on oilseed growers and oil processors, the ceiling put on the domestic prices (because of the imported oil) can have dampening effect on prices of oilseeds and margins of processors and ultimately may make the crop unremunerative and manifest in falling area under the crop. Such a change has both micro and macro level implications. At the macro level, impact of a fall in the prices of edible oils (due to imports) leading to that in oilseeds has to be analysed in terms of the overall impact of trade liberalisation on the agricultural sector. The net gains and losses would depend upon intra sector changes such as those in cropping pattern and extent of exports and imports and would determine gains/losses of the cultivators vis-a-vis consumers due to the changes in prices and demand. At the micro level, however, it cannot be denied that edible oils being substitutes of each other for the consumers, increasing imports may affect prices of the oilseeds and hence incomes and profits of the cultivators adversely. This again might lead to changes in the decisions of the farmers relating to cropping pattern if the existing cropping pattern is no more profitable. Fear has been expressed that increasing dependence on imports/international markets for edible oil might be risky if the prices fluctuate violently. Therefore, assessment of impact, if any, of trade liberalisation on the edible oil sector becomes necessary.

1.3 Edible Oil Sector in India: A Profile

The edible oil sector in India is composed of two broad segments. Firstly, the oilseed crop and the cultivators and secondly, edible oil and the processors. In the former case, oilseeds occupy an important position in terms of area, production and the growth rates of the same among the agricultural commodities. Firstly, at the national level, the area under oilseeds is growing at the rate of 2.9 percent and production at the rate of 5.9 percent since 1986-87. The coverage under irrigation which was initially 17.3 percent increased to 26.3 percent in 1996-97. This particular phenomenon was called

‘Yellow Revolution’ in the Indian agriculture, wherein the cropping pattern showed changes-area under coarse cereals was replaced by oilseeds and pulses (Gulati, 1999). India has contributed 17 percent of world area under major oilseeds and 9 percent of the world production as in 1997-98. The major problem faced by the Indian oilseed sector is thus the lower yield of the crop. Whereas the world yield of oilseeds was 1662 kg/ha in 1998, for India it was only 885/ha (Damodaram and Hegde, 2000).

Nevertheless, increasing area and production of the oilseeds indicates increasing importance of the final product i.e. oils – the second segment of the sector, in the consumption basket of the population. The NCAER elasticity estimates show that the per capita demand for edible oils which is estimated at 9.81 kg/annum in 1999-2000 would rise to 11.55kg, 13.95 kg and 16 kg in 2004-05, 2009-10 and 2014-15, respectively (Damodaram and Hegde, 2000). Similarly, the present per capita intake of edible oils is 7.5kg as against the world average of 15kg (GOI, 2000b).

As far as the oilseed processing industry in India is concerned, it is the largest and most heterogeneous in the world (Singh and Asokan, 1999). It is widely recognised that the level of inefficiency is very high in the oilseed processing industry due to excess capacity in the large units and inefficiencies in the small ones. The impact of trade liberalisation is likely to be felt by these in terms of lower margins due to cheaper imports. With cheaper imports, the high cost processing industry is expected to get adversely affected possibly with the consequences on the oilseed cultivation. Table 1.2 gives a brief outline of the edible oil sector in India.

With liberalisation and the era of delicensing, deregulation and decontrol since 1991, the number of units and the capacity increased tremendously. The striking feature revealed is the lower level of capacity utilisation in various segments of the society.

Table 1.2: Profile of the Oilseed Processing Sector in India

Units	Number	Annual capacity (lakh tonnes)	Capacity Utilisation (%)
Oil crushing units	150,000 approx.	425(seeds)	10-30
Solvent extraction units	818	345(oil bearing material)	34
Refineries	300	50 (oil)	32
Vanaspati units	201	31.5 (vanaspati)	33

Source: GOI (2000b)

It can be seen from Table 1.1 that the domestic availability and imports of edible oil both show an increasing trend since 1990. However, though total availability is

increasing steadily, the shares seem to be changing. The imports are seen to have suddenly increased, in 1994-95 and in 1998-99 and constitute nearly 30 percent of the total availability. The domestic production is increasing at a much more stable rate. In 1999, India ranked as the world's largest importer of edible oils, replacing China. Thus, through imports, India is largely dependent on the international markets.

In the case of exports, out of total value of exports (of oilseeds, oils and cake/meal) the major exports are of oil cake/extracts in the value terms and these are increasing since late 1980s. The exports mostly constitute oilcakes/meals of soybean and Rapeseed-Mustard. The overall picture suggests a growing edible oil sector having a potential to grow further, given the increasing demand for the product.

1.4 The Review of Literature

Assessment of the impact of trade liberalisation has been an interesting area of research. Literature on this area of research presents results at economy level as well as at the sectoral level that are rather mixed and often contradictory to each other as far as their predictions relating to various sectors/inputs are concerned. As is summarised by Singh and Asokan (1999), some studies predict that trade liberalisation would positively affect farmers and landless labourers (Anderson and Tyres, 1993). However, some studies indicate that gains from trade would be accompanied by higher prices for the consumers and a skewed distribution. Another study, wherein the results show a positive gain with not very different cost of living with trade liberalisation, takes a macro view and argues that the comparative advantage for certain commodities (such as foodgrains) lies in domestic production, whereas for some other commodities (such as edible oils), it lies in their import given the existing technology, the 'small country' assumption, exchange rate and the cropping pattern etc. (Gulati, 1999)

In spite of the fact that the results are mixed, the important issue that gets highlighted from these studies is whether the dependence on markets and price mechanism would initiate response from the cultivators. This thus highlights the importance of the non-price factors that create supply bottlenecks.

For the oilseed sector, the major concern expressed through the literature is declining area under oilseeds due to imports of oilseeds (Singh and Asokan, 1999, Gulati, 1999). The argument is that substitutability between different edible oils

and availability of cheap imported oils would reduce derived demand for the oilseeds and would lead to a decline in area under the crop. On the background of great potential for increase in the demand for edible oils, increasing imports would again put strain on the country's BOP.

However, concern has also been expressed about higher profitability of oilseeds cultivation and area shifts from foodgrains to oilseeds and inefficiencies in the resource use in the process of shift (Gulati, 1990). It was felt that productivity augmentation was more important than providing price incentives to the cultivators in case of edible oils (Gulati, 1990, Gulati et al, 1996).

The literature reveals that except for soybean, oilseeds were protected till 1990s. The oilseed prices except those of soybean were kept above the world prices through 1980s and early 1990s. (Singh and Asokan, 1999). The net protection coefficient for major oilseeds and oils were observed to be greater than one till 1990-91. Soybean was unprotected mainly because of exports of soymeal. We study the soybean sector in India on this background.

1.5 Growth of Soybean Sector in India: Expansion and Importance

Soybean crop at the national level is around thirty year old with Madhya Pradesh as the pioneering and only state for initial few years and Maharashtra joining in mid-1980s. The expansion of area under soybean thereafter took place at quite a fast rate in absolute as well as relative terms. The area under soybean as well as its production show an increasing trend after mid 1980s. It has been observed that increasing share of and area under soybean can be attributed to some extent to a fall in the share and area under crops like kharif jowar and cotton in the semi-arid tropics of central India (Khare, 1994; Gulati, 1999). Soybean thus occupies an important place in the cropping pattern at the national level. The growth rates of area, production and yield are presented in Table 1.3. In 1998-99, 23.6 percent of the total area under oilseeds was under soybean and 28 percent of the total production of oilseeds, was contributed by soybean (Damodaram and Hegde, 2000). Table 1.3 shows that in the initial period, the area under and production of soybean expanded at a faster rate. The initial momentum seems to have lost in the latter period.

Table 1.3: Growth Rates of Area, Production and Yield of Soybean in India.

Years	Area (%)	Production(%)	Yield (%)
1970-71 to 1997-98	22.89	24.84	1.58
1970-71 to 1985-86	33.05	35.05	2.53
1986-87 to 1997-98	14.24	19.91	4.96

Source: Damodaram and Hegde (2000)

The important position of soybean in the cropping pattern consequently gets reflected in the production of soybean oil, which is largely used for cooking purposes in major soybean growing areas. This was revealed from various discussions with the people, field investigators, as the data relating to it was not available. Table 1.4 presents data on a comparative picture of production of edible oils in India.

Table 1.4: Production of Edible Oils in India (In lakh m.t.)

Oil	1981-82	1991-92	1994-95	1997-98
Groundnut	11.29	16.33	18.56	16.20
Mustard	7.08	17.93	15.78	16.00
Seasame	1.38	2.20	1.82	2.90
Safflower	0.66	0.40	0.83	1.10
Sunflower	0.24	4.38	4.18	4.70
Nigerseed	0.29	0.38	0.40	0.40
Soybean	0.24	4.30	4.38	7.30
Cottonseed	2.49	3.46	4.24	3.40
Coconut	1.76	2.98	3.93	4.60
Total	25.60	50.22	53.48	56.60

Source: Indian Agriculture, as quoted in Solvent Extractors Association of India (SEA) (2000).

In relative terms, the production of soybean oil lags behind that of groundnut and Mustard oil. However, it is growing at a very fast rate. During 1981-82 to 1997-98, its production has increased by more than 2000 percent. Soybean oil is thus emerging as the important commodity in the oil basket at the national level.

Moreover, soybean oil is a major input to the Vanaspati industry. As can be seen from Table 1.5, share of soybean oil to Vanaspati production is the highest among all other oils. There is a sudden jump in the imported oil component (which is mainly RBD Palmolein) and a consequent reduction in the share of domestic oils. However, share of soybean oil is maintained even on this background.

Table 1.5: Consumption of Edible Oils in the Production of Vanaspati in India
(In percentage)

Oils	1995-96	1997-98	1998-99 (Nov-May)
1.Imported Oil	14.2	38.8	42.4
2.Domestic Oil			
A. Compulsory: Sesame	2.8	2.4	2.3
B. Other			
Soybean	20.3	20.4	24.4
Cottonseed	14.3	6.0	6.6
Rice bran	19.3	13.5	15.3
Sunflower	8.7	3.8	4.5
Rapeseed / Mustard (SE)	16.1	7.0	3.0
Others	4.3	8.1	1.5

Source: Directorate of Vanaspati, Vegetable Oils and Fats, GOI as quoted in SEA (2000)

Note: Consumption of Vanaspati in 1996-97 not available

Next, soybean is one of the main contributors to GNP through the exports of soybean cake/ meal. It can be seen from Table 1.6 that soybean oilcake/ extraction accounts for more than 50 percent of the quantity and value of total exports and is increasing over the period at a very fast rate.

Table 1.6: Exports of Oilcakes / Extractions from India
(Quantity in 000 tonnes, Value in Rs crores)

Oilcakes/ Extractions	1992-93		1998-99	
	Qty	Value	Qty	Value
Soybean	1825.00	1114.37	3023.0	1803.0
Total	3606.1	1541.67	3626.5	2042.0

Source: SEA data bank, Bulletin of Food Statistics, Agricultural Situation in India, DES, GOI as quoted in Damodaram and Hegde (2000)

Contribution of soybean to total value of output from agriculture (at current prices) is also quite high-around 20 percent of the total value of output from oilseeds. Since 1980-81, value of output from soybean has increased by more than 4000 percent till 1997-98 as the NAS data shows (National Accounts Statistics, CSO, GOI, 1998 as quoted in Damodaram and Hegde (2000)). Increasing area and production of soybean seeds, rising production of soybean oil, its extractions (and its exports) and its rising value of output all point towards increasing flow of resources being directed towards this sector. Rising importance of the produce also hints at its profitability and gains to the producers.

1.6 Need for the Study

In the light of potential for increasing consumption/usage of soybean and its products occupy in the consumption basket, it is necessary to analyse whether the process of trade liberalisation and tariff reduction has had any impact upon the current status of soybean sector in India. Adverse impact, if any, of trade liberalisation would mean falling area under and production of soybean. As a consequence of this, the processing industry and the sale of the final products would be hampered. This would obviously affect the employment of resources and income generation in this sector. Specifically to note is its effect on small farmers in soybean cultivation who are unorganised (as against the processing units and exporters) and depend largely on vagaries of nature for the production. The data on wages for kharif crops (published by DES, Ministry of Agriculture, as quoted in GOI, 2000a) shows that the labourers engaged in soybean cultivation get higher wages than those engaged in cultivation of other crops in the soybean producing states. A declining demand for soybean would affect the demand and employment of labour.

Maharashtra is the state, second in the rank after Madhya Pradesh as far as area under and production of soybean is concerned. It would be interesting to study the impact of trade liberalisation on soybean economy of the state.

1.7 Objectives of the Study

The basic objective of the study is to analyse the changes, if any, in the soybean sector of Maharashtra, consequent upon changes in the trade policy regime. As trade liberalisation basically relates to removal of controls on trade and reduction in (at least initially) tariff rates in the case of edible oils, the basic issue revolves around effect of cheap imported oil on soybean production. The stated broad objectives of the study are:

1. To assess the changes in the cropping pattern and
2. To assess the impact on farmers' income due to decrease in production and prices of oilseeds.

These objectives envisage firstly, to analyse changes in area, production and yield of soybean in the post reform period as compared to the pre-reform period at the state level. Secondly, to analyse the impact of reduced tariffs and cheap imports of edible oils on soybean prices in the domestic market and thirdly, to assess impact of

trade liberalisation on the cropping pattern, income, profitability and employment in the case of soybean cultivators in the villages of Maharashtra.

1.8 Methodology of the Study

1.8.1 Methodology and Limitations

The study utilises secondary as well as primary data. For assessing the impact of trade liberalisation on the soybean economy of the state, secondary data relating to area, production, yield, imports-exports, prices, indices, MSP, cost of cultivation, cost of production and other related variables was collected from sources like Districtwise Statistical Information relating to Agriculture (GOM), Oilseeds Situation: A Statistical Compendium, (Directorate of Oilseeds Research), Report of the Commission for Agricultural Costs and Prices (GOI, 2000a). Information relating to the soybean Processing Industry was primarily collected from SEA Handbook (2000).

In the case of secondary data, the major focus was on analysing the changes firstly in area, production and yield of soybean in the pre and post reform period and secondly in the prices of edible oil – domestic and imported during the liberalisation period. An attempt has been made to relate the latter to the former to understand, if the existing cropping pattern was changing.

In the case of primary data, again, the trends in area, production, productivity and labour use in case of soybean and the competing crops were noted. This was related to the profitability of the crops. For this exercise, for each crop of the household, various indicators of profitability were calculated and the extent and the direction of change in the same over the survey period were noted. Lastly, the perceptions of the respondents on the likely impact of trade liberalisation were recorded. For understanding the current position and opinions of the soybean processing units regarding trade liberalisation, their responses were also analysed.

As soybean is a relatively new crop, the data relating to the same is reported in the government publications only since late 1980s. Thus, the analysis in the study is based on data from 1987-88 to 1998-99/1999-00 for the state or district level. A comparison of the pre and post reform period in this regard also thus utilises the same data.

The data constraint (limited observations in the pre and post reform period) thus prohibits any exercise which tries to find response of area under soybean to the variable representing liberalised imports. Secondly, prices of soybean oil representing the state are not available in major publications of state or central government. Hence, price of soybean oil prevailing at the Mumbai market and Indore market (Madhya Pradesh) is considered throughout the study. Price of soybean published in the District Socio-Economic Abstract of District Nagpur is considered as the representative price for the state as a whole.

1.8.2 Sampling Design

For analysing the impact of trade liberalisation at the micro-level, district with soybean as the major crop had to be selected as was suggested by the co-ordinating centre. The secondary data published by the Government shows Nagpur as the district with highest area (absolute as well as the percent of GCA of the state) under soybean cultivation. Similarly, 24 percent of the state area under soybean cultivation falls in district Nagpur. The following Table provides data on the basis of which district Nagpur and the talukas therein were selected for the purpose of the survey. Using the same criteria viz. absolute area under soybean and share of area under soybean to gross cropped area, three villages were chosen in each taluka. Discussions with the officials in Zilla Parishad proved to be useful in selecting three villages in each taluka. We use the terminology - V1, V2, V3 for the respective villages in the two talukas.

Table 1.7: Selection of the District and the Sample Talukas

Selection of the District and Talukas	Area under Soybean (ha)			Area under Soybean/GCA(%)		
	1996-97	1997-98	1998-99	1996-97	1997-98	1998-99
Selection of the District: Nagpur	164300	163500	183500	36	40	43
Selection of the Talukas :	1993-94	1994-95	1995-96	1993-94	1994-95	1995-96
Umred	23904	28335	29841	40	46	46
Narkhed	20642	17020	13213	32	32	24

Source: 1. For the district-Districtwise Agricultural Statistical Information of Maharashtra (GOM), various issues. 2. For the talukas- Office of the Commissioner of Agriculture, GOM, Pune.

Note: Taluka wise information for the recent years is not available

As per the guidelines of the coordinating centre, twenty sample households were selected in each village stratified by the size of landholding, thus making the total

number of households 60 for each taluka. The households chosen in each village represent different size classes of land held by the households. Approximately, five households in a particular size class were chosen. These were- below 1 ha-Marginal, 1ha to 3.99 ha-Small, 4ha to 9.99ha-Medium and above 10 ha-Large households. We denote these by size classes I, II ,III ,IV respectively.

The survey was conducted during January and February 2000 and the data was collected for three years from 1998-99 to 2000-01. The Schedule prepared for the sample households covered questions relating to their cropping pattern, cost of cultivation, income, profitability of crops, prices received, government support as well as their perceptions about the likely impact of trade liberalisation. As far as the processing units were concerned, they were to be selected randomly. Though several units were contacted, only three units were able to respond back. The schedule prepared for the processing units contained questions that mainly aimed at knowing the problems faced by the processors due to the inflow of imported edible oil.

1.9 Design of the Study

The study consists of five chapters. The present introductory chapter incorporating an introduction to and a background of the problem, objectives and methodology of the study is followed by the second chapter, which deals with the profile of soybean cultivation in Maharashtra. The third chapter looks into the liberalisation of trade in the context of edible oils, phases in it and discusses its likely impact on soybean sector in Maharashtra. The fourth chapter analyses the impact of trade liberalisation at the micro-level i.e. on soybean cultivators. This is followed by the concluding chapter.

CHAPTER II

GROWTH OF SOYBEAN SECTOR IN MAHARASHTRA

2.1 A Comparative Picture of Oilseeds Cultivation in Maharashtra

The growing importance of oilseed cultivation in Maharashtra's agriculture is clear from the increasing trend in area under oilseeds which was 145400 ha in 1960-61 and 2697600 ha in 1998-99, thus registering an increase of 1755 percent. The production has grown nearly three times registering an increase of 363 percent over a period of forty years. This shift indicates an increase in (derived) demand for oilseeds as well as supply of the same. Table 2.1 provides a comparison of area and production of various edible oilseeds in Maharashtra.

Table 2.1: Trends in Area and Production of Edible Oilseeds in Maharashtra during Nineties. (Area in 000 ha, Prod. in 000 tonnes)

Crop	Area			Production		
	90-91	94-95	98-99	90-91	94-95	98-99
1. Ground nut	K 881.1	603.0	407.7	991.3	628.7	474.6
	R -	-	113.0	-	-	159
2. Soybean	200	560.5	1055.3	189.3	525.8	1471.9
3. Sunflower	K 198.3	210.4	167.8	96.2	100.2	105.0
	R 298.7	299.7	258.0	207.1	180.9	133.0
4. Safflower	628.1	485.4	321.0	255.3	259.5	208.0
5. Sesamum	288.2	249.9	142.7	75.2	54.5	43.4
6. Linseed	226.9	154.5	104	47.2	40.8	21.0

Source: Damodaram and Hegde (2000)

Note : K= Kharif, R= Rabi

Till mid 1980s, areawise, the major oilseed in Maharashtra was groundnut. However, since mid 1980s, farmers have started cultivating non-conventional oilseeds, specifically soybean and the area under this crop is picking up at a high pace. Area under groundnut is continuously falling –a phenomenon observed in all the regions of Maharashtra. Table 2.1 clearly shows the importance of soybean in terms of area and production in the total. Its contribution to total area and production of Kharif and Rabi oilseeds is seen to be highest in absolute terms in the year 1998-99. Thus it is growing at a very fast rate. This is clear from Table 2.2.

Shorter duration and easy cultivation, benefits in terms of improvement in fertility, prompted farmers to undertake soybean cultivation primarily in the north east region of the state where the climatic conditions were also suitable for soybean

cultivation. The shorter duration of the crop (i.e. 3 to 3.5 months- from June to September) allows the cultivators to take the second crop on the same piece of land and add to their income/profits, which is not possible for kharif crop like cotton. Being a purely commercial crop, it is not retained for home consumption. Similarly, it is not retained for the purpose of expulsion also, as the processing requires a large operation unit and sophisticated technology. One time harvest of the crop makes the harvesting operation comparatively easier. As it is basically a kharif crop and less water intensive, area irrigated under soybean is very low. It was only 4700 ha. in 1994-95, which is quite negligible as compared to the gross area irrigated which is 3377100 ha in Maharashtra in 1994-95.

Table 2.2: Compound Growth Rates of Area, Area under Irrigation, Production and Yield of Soybean in Maharashtra in 1980 and 1990. (Percent per annum)

Area	Share of area in GCA	Share of area in Total oilseed area	Production	Yield
25.06 (1984-85 to 1998-99)	23.5 (1987-88 to 1998-99)	23.7 (1988-89 to 1998-99)	33.6 (1987-88 to 1998-99)	6.49 (1987-88 to 1998-99)

Source: Districtwise Statistical Information of Maharashtra, Part II (GOM), various issues.

A continuous decline in soybean prices other things remaining the same would lead to a fall in the profitability of the produce and in the long run might lead to a shift in favour of more profitable crop. The assumption here is that the farmers are price responsive, profit maximisers and that the production is purely for sale in the market. This is a reasonable assumption for a purely commercial crop like soybean, which is also not retained for processing that takes place at large scale. At the state level, the behaviour of the farmers gets expressed in the cropping pattern and trends in the area under the concerned and the competitive crop. Examination of changes in area under different crops of the same season during a particular period would give us an idea about the competing crops (Gulati, 1990). It has been already noted that in case of Maharashtra, the area under soybean and the total cultivated area has been rising at a very high rate. The area under another kharif crop –kharif jowar is declining during the same period. This particular phenomenon is also noted by other studies (Khare, 1994, Gulati, 1999). This trend is also observed in the post reform period (i.e. post 1994-95). This can be noted from figure 2.1.

Figure 2.1 : Trends in Area under Soybean and Kharif Jowar in Maharashtra

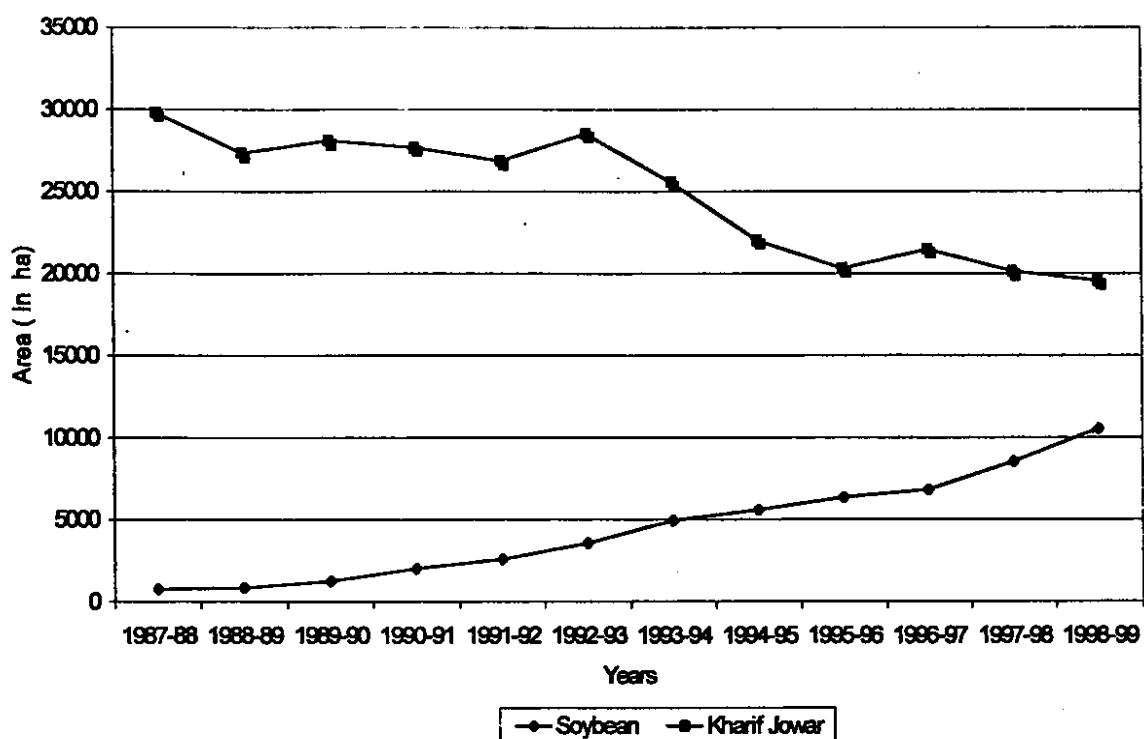
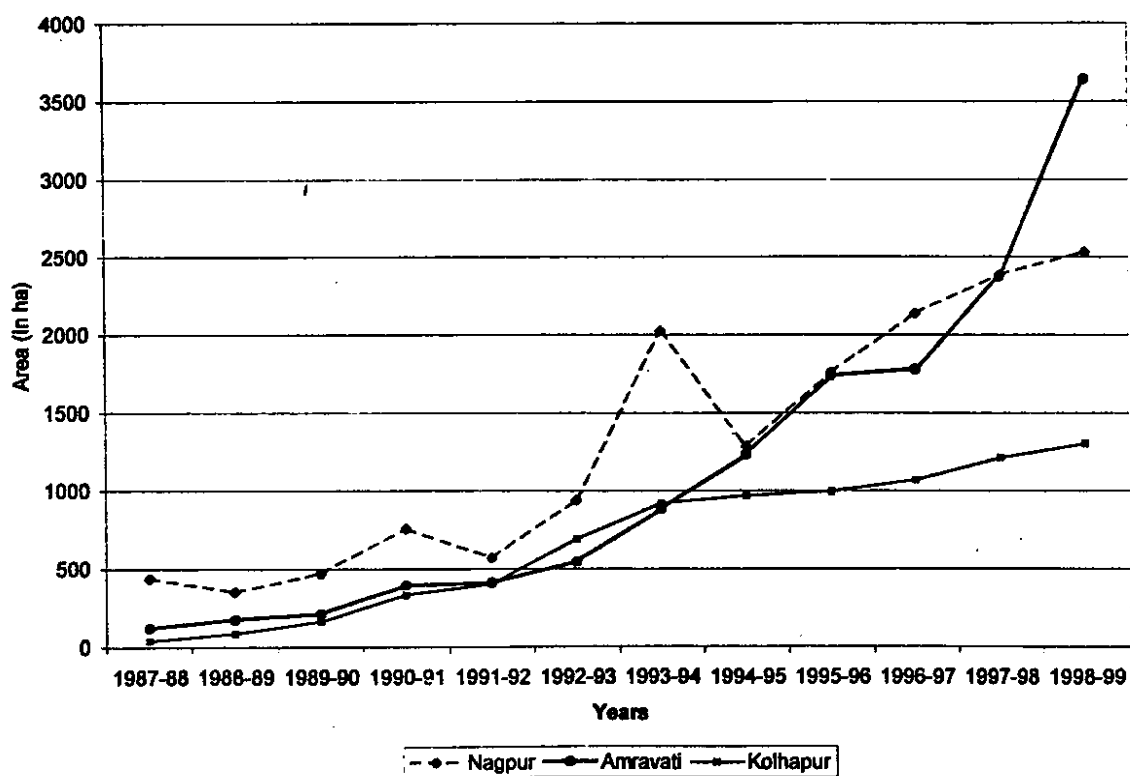


Figure 2.2: Trends in Area under Soybean in Various Regions in Maharashtra



2.2 Soybean Cultivation: The Regional Spread

Soybean cultivation is concentrated in two regions of Maharashtra, viz: Vidarbha and Western Maharashtra. More than 90 percent of the soybean production of the state is contributed by these regions. The area under the crop is highest in the former region specifically in Nagpur district (Table 2.3, Figure 2.2). However, yield seems to be similar for all the districts across Maharashtra. As mentioned above, area under irrigation is negligible in Maharashtra. However, out of the total 4700 ha irrigated, 3700 ha is contributed by Nagpur region. The growth rate of area, production and yield of soybean is seen to be higher in the latter two regions. Thus in other regions, soybean cultivation is picking up at a faster rate.

Table 2.3: Regionwise Profile of Soybean Cultivation in Maharashtra, 1998- 99.

Division	Share of area in total oilseed area in region(%)	Share in GCA in the region (%)	Share in Soybean Prod. In Maharashtra (%)	Yield (Kg / ha)	Growth rate (%) (1987-88 to 1998-99)		
					Area	Prod.	Yield
Nagpur	82	23	42	1218	21.07	28.61	5.92
Amravati	70	9	36	1494	30.40	41.05	10.65
Kolhapur	40	6	16	1906	29.44	40.44	14.11

Source: Same as in Table 2.2.

2.3 Soybean Sector in Maharashtra and Madhya Pradesh

To get an idea of relative position of soybean sector in Maharashtra, we juxtapose it with that of Madhya Pradesh. Table 2.4 shows that there is a vast difference between area and production of soybean in Maharashtra and Madhya Pradesh.

Table 2.4: Soybean Sector in Maharashtra and Madhya Pradesh

Particulars	Maharashtra		Madhya Pradesh	
	Area (ha)	Production (000 tonnes)	Area (ha)	Production (000 tonnes)
1996-97	681.9	877.7	4165.8	3940.8
1997-98	855.6	845.3	4469.7	4845.1
1998-99	1055.3	1471.9	4420.1	4473.1
No. of SE units(members of SEA)	60		67	
Overall oil/cake producing capacity Annual(300days)(MT)	3541500		8242500	

Source: 1. Damodaram and Hegde (2000) 2.SEA (2000)

However, the striking point to be noted is declining trend in area and production in Madhya Pradesh, as against that of Maharashtra. The percentage of area under and production of soybean in Maharashtra to that of Madhya Pradesh is rising over the period.

In case of the processing units, the overall oil/cake producing capacities are higher in case of Madhya Pradesh as compared to Maharashtra. With falling area under and production of soybean in Madhya Pradesh, there is a possibility that soybean produced is sent out of Maharashtra for processing and that the demand for soybean in Maharashtra is increasing given the general under utilisation of plant capacity in the country.

CHAPTER III

IMPACT OF CHANGING TARIFF STRUCTURE ON THE PERFORMAMNCE OF SOYBEAN: A STATE LEVEL ANALYSIS

3.1 Introduction

According to the economic theory, prices through their effect on relative profitability play important role in farmers' decisions relating to allocation of land to different crops. With changes in relative prices, of inputs and output, farmers would respond by adjusting cropping pattern to maximise their benefit. Cheaper imports due to lower tariffs can affect the domestic prices adversely if the price of imported good including the tax rate and other costs are less than the domestic prices, thus setting a floor to the latter. The level at which domestic prices get settled would also depend upon the external factors like weather conditions and demand for the crop especially at the international level e.g. a bumper harvest of soybean and declining demand for exports of final products such as soymeal would aggravate the decline in soybean prices received by the farmers due to the cheaper imports.

The impact of international developments was felt most in case of soybean products. Prices of soymeal were depressed since 1997 due to the East Asian crisis. However due to shortages of palm oil, soy oil prices were ruling high. Thus, there was demand for oilseeds from the oil side. However, soybean prices crashed in 1998 due to good soybean harvest in the exporting countries (Singh and Asokan, 1999). By February 1999, domestic and international prices were about 25 percent below the levels prevailing in year earlier and even below the MSP (GOI, 2000b). Table 3.1 shows that for the recent two years, price indices of soybean, soyoil and soymeal are falling in the international markets.

Table 3.1: Indices of International Prices of Soybean, Soymeal and Soybean Oil

Commodity	1995	1996	1997	1998	Monthly Average	
					Jan.99	Feb 99
Soybeans	105.1	123.4	119.7	98.1	89.0	82.1
Soymeal	98.4	133.7	137.8	84.8	75.7	70.0
Soybean Oil	139.7	123.3	126.2	139.8	120.8	107.7

Source: GOI (2000a)

It is expected that the international prices of soybeans and soymeal are likely to be restrained due to the demand crisis in the East Asia.

Hence it is expected that increasing imports of cheap edible oil (that competes with the domestic oil) in the country would reduce relative price and profitability of soybean cultivation through the impact on demand for soybeans. At the macro level, the impact can be observed by relating the cropping pattern changes to the relative prices. The major issue in this regard is the way prices of edible oil get transmitted and affect the price of soybean at the micro-level i.e. in the village market. The assumption required in this case is that the markets are related and the prices in the market of the final product- edible oil are transmitted to market of the input- the soybeans at the village level. We observe firstly, the trends in the prices in the domestic market and secondly relate these to the changing tariff structure.

3.2 Trade Liberalisation and Soybean Cultivation in Maharashtra

3.2.1 Trends in prices

It is seen from the Tables 3.2 and 3.3 that price indices and prices of imported and domestic oil show an increasing trend till 1998-1999 thus covering the post liberalisation period too. It has been mentioned that the imports of edible oil started increasing especially after 1996-97(Imports of soybean oil exhibit a declining trend and data is not available after 1995-96.Hence we rely on total edible oil imports). However, prices of oil in the domestic market do not seem to have fallen in response immediately but only in 1999-2000.Prices of soybean in both the markets seem to be much stable though showing a slight decline in the last two years as compared to the earlier years. Figures 3.1 and 3.2 also depict this particular trend in prices.

Table 3.2 : Index Numbers of Wholesale Prices (1981-82=100)

Year	Soybean	Oilseeds	Edible Oil	Imported Oil
1994-95	318.8	265.6	279.9	348.8
1995-96	342.3	284.6	301.6	357.8
1996-97	367.7	285.3	301.1	357.8
1997-98	396.8	293.1	299.4	357.8
1998-99	353.9	347.5	348.5	415.5

Source : GOI (2000a).

Figure 3.1 : Trends in Availability of Imported and Domestic Soybean Oil in India

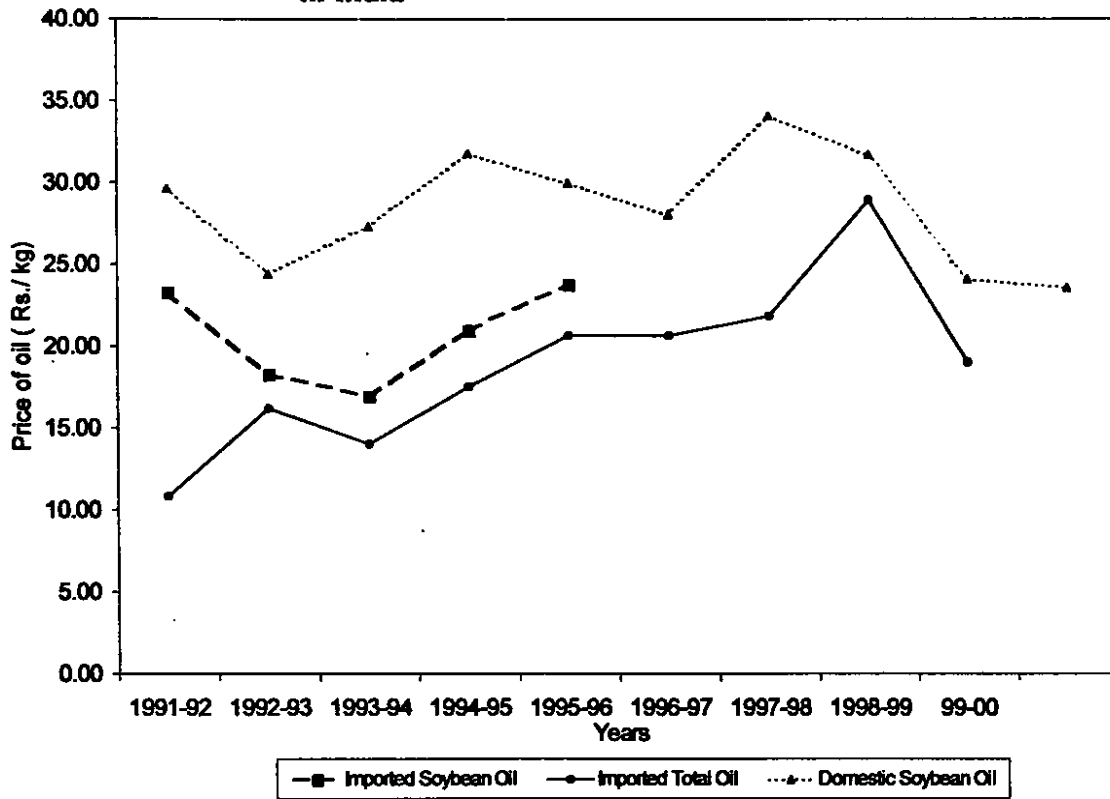


Figure 3.2 : Trends in Prices of Soybean in the Domestic Markets

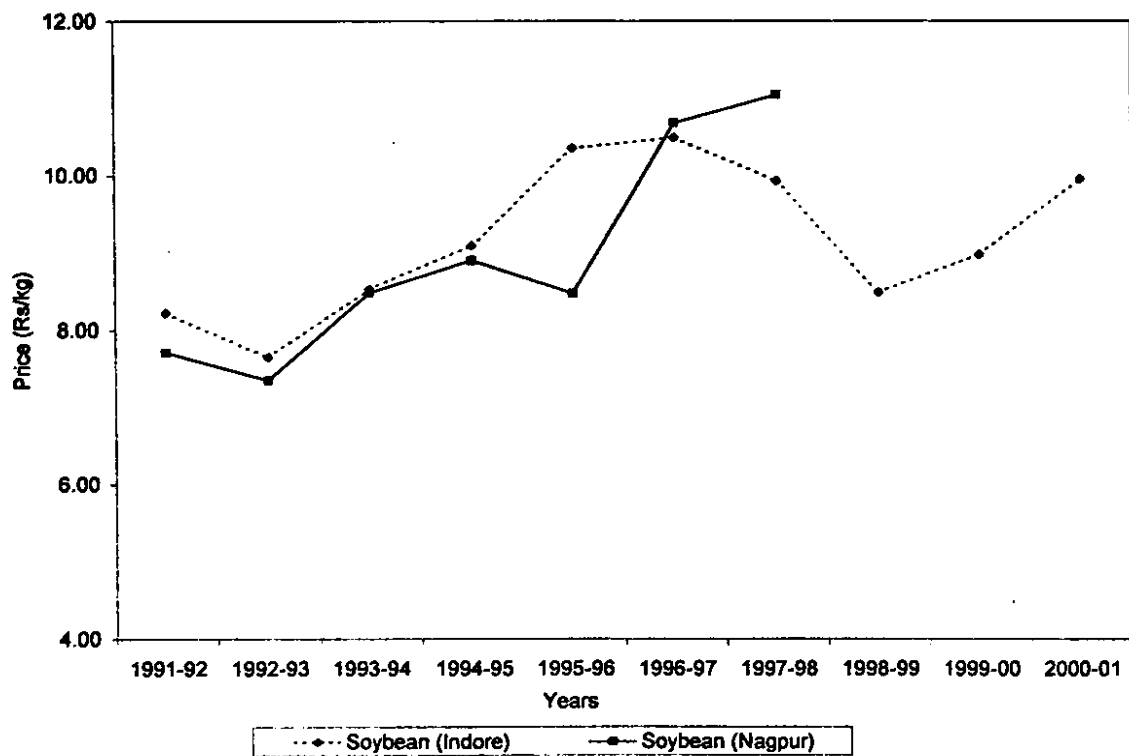


Table 3.3: Unit Value of Imported Oil, Price of Domestic Oil and Soybean Seeds
(Rs/Kg)

Year	Imported Oil		Domestic Oil		Soybean Seeds	Soybean Seeds
	Soybean Oil	Total Oil	(Indore)	(Mumbai)	(Indore)	(Nagpur)
1991-92	23.27	10.84	29.64	na	8.22	7.71
1992-93	18.31	16.21	24.38	na	7.65	7.35
1993-94	16.93	14.03	27.31	29.5	8.53	8.48
1994-95	20.96	17.52	31.76	31.9	9.09	8.90
1995-96	23.83	20.68	29.98	29.75	10.36	8.47
1996-97	na	20.67	28.07	28.55	10.50	10.68
1997-98	na	21.84	34.11	36.84	9.93	11.05
1998-99	na	28.94	31.73	27.08	8.48	na
1999-00	na	19.03	24.08	na	8.98	na
2000-01	na		23.55	na	9.96	na

Source: 1. For imported oil- Damodaram and Hegde (2000). 2. For domestic oil and soybean – for Indore Market - www.indiasoyaforum.com for Nagpur Market- SEA(2000), -Socio-Economic Abstract :Nagpur, GOM, various years respectively.

We observe these developments on the background of changing tariff rates for the edible oils and see whether the declining tariff rates have affected domestic prices of soybean oil and seeds. Imposition of tariffs as a policy variable is expected to bridge the gap between higher price of domestic oil and that of the imported oil and to provide protection to the processors and the cultivators. Hence due to the changing import volume and import prices, soybean sector has been experiencing changes in tariff rates. To get a rough estimate of prices of imported oil, we apply the tariff rates shown in Appendix 1.1 to the unit value of edible oil and calculate the effective price (i.e. inclusive of the tax rate) of imported oil. We compare this with the corresponding price of soybean oil and total oil in the domestic market and finally take the ratio of the two.

Here, 'P' is the price of imported oil and 't', the tax rate (import duty), hence the effective price after tax is $P(1+t)$. Here, price 'P' has to be taken as given with the 'small country assumption'. It can be seen that the observations relating the policy variable-the tariff rate get roughly divided into two phases-the first from 1994-95 to 1998-99 when the prices of soyoil/total oil in the domestic market as well as of the imports though fluctuating, are comparatively high/increasing. This is a phase marked

by deregulation and gradual decline in the import duty from 65 percent to 15 percent. Falling prices and increasing import duty marks the second phase after this period.

Table 3.4: Comparison of Effective (with tax rate) Import Price of Total Edible Oil and the Domestic Price of Soybean Oil (Rs/kg)

Year	Unit Value of imports	Import Duty (%)	Effective Price of Imports [p(1+t)] (1)	Domestic Price (2)		(2) / (1)	
				Indore	Mumbai	Indore	Mumbai
1994-95	17.99	65	29.68	31.76	31.90	1.07	1.07
1995-96	21.28	30	27.66	29.98	29.75	1.08	1.08
1996-97	20.67	25	25.83	28.07	28.55	1.09	1.11
1997-98	21.84	15	33.28	34.11	36.84	1.02	1.11
1998-99	28.94	27.50	24.26	31.73	27.08	1.31	1.12
1999-00	19.03	65	31.40	24.08	Na	0.77	-

Source: 1.For unit value of imports and tariffs- Damodaram and Hegde (2000). 2.For domestic prices, same as in Table 3.3

Note: As the unit prices of individual or total edible oil is not available, we consider here, the unit value of total edible oil imports.

The effective price, though fluctuating, is seen to be having a declining trend initially followed by an increase. Comparing the effective price with the price of domestic soybean oil, we find that the former is lower than the corresponding domestic price in Indore and Mumbai markets till 1998-99 and is seen to have risen in the year 1999-2000. The available data shows that in the first phase of lower import duties, the ratio of domestic to imported oil price is greater than one. However, with the imposition of higher import duties since 1998-99, the ratio has fallen below one. The available data shows that the imposition of higher import duty as a policy variable, to bridge the gap between domestic and imported oil, has increased the price of imported edible oil as compared to the domestic oil. We relate these trends to the trends in area under and production of soybean in Maharashtra.

3.2.2 Area, Production and Yield in the Pre and Post Reform Period

It has already been noted that in Maharashtra area and production of soybean show an increasing trend since the beginning of soybean cultivation. We observe here the percentage change in the pre and post reform period of the same in Table 3.5. It can be seen that the rate of change in area, production, yield and share of area under soybean in state GCA though positive, is definitely lower than in the earlier period.

However, the difference seems to be apparent on the background of lower baseline (of the year 1987-88) figures of area, production and productivity.

Table 3.5: Percentage Change in the Pre and Post Reform Period in Area, Production and Yield of Soybean in Maharashtra (In percentage)

Years	Area	Share of area in GCA	Production	Yield
1987-88 to 1993-94	543.51	529.62	2762.77	321.07
1994-95 to 1999-00	107.6	81.96(1994-95-1998-99)	208.1	48.40

Source: Districtwise Statistical Information of Maharashtra, part II, various years (GOM)

after 1994-95. The available data i.e. 1994-95 onwards does not permit any area response study to demarcate the impact of liberalisation, seasonal factors etc. Hence we have to rely on a direct comparison of trends in area, production and prices in the pre and post liberalisation period and draw conclusions. It is seen that the post reform period does not show any declining trend in area under and production of soybean. Even with the assumption that prices as one of the explanatory factors affect area under cultivation with a lag (i.e. here, a few years after the steps for liberalisation and tariff reduction were taken in 1994-95), such a trend is not observed in case of Maharashtra. This indicates relative profitability of soybean cultivation in the post liberalisation period too.

To get a rough estimate of profitability of soybean cultivation, at the state level, we also look into the structure of cost of production per unit of soybean in Maharashtra-as compared to the respective prices. Soybean prices are seen to be rising over the period i.e. till 1996-97. So are the costs. The lack of data on soybean prices for the recent past years does not permit any profitability exercise considering the per unit price and per unit cost of production. However, if we assume that the prices of soybean are falling after 1997, like those in Indore, the gap between price of output and per unit cost of production would fall indicating falling profitability. However, on the basis of increasing area and production of soybean in Maharashtra (as against that of Madhya Pradesh), and possibly increasing derived demand for soybean from the processing industry, if we assume that the prices would be increasing, then we can expect that the profitability of soybean cultivation would be maintained.

Table 3.6: Cost of Production (COP) and Price of Soybean in Maharashtra (Rs per quintal)

Years	COP (1)	Price		Gap (2-1)	
		Indore (2a)	Nagpur (2b)	(2a)	(2b)
1991-92	592.74	822.48	771	229.74	178.28
1992-93	571.42	764.7	735	193.28	163.58
1993-94	590.75	853.17	848	262.42	257.25
1994-95	663.5	909.13	890	245.63	226.5
1995-96	693.31	1035.83	847	342.52	153.69
1996-97	827.24	1049.69	1068	224.45	240.76
1997-98	918.00	993.14	1105	75.14	187
1998-99	875.93	848.28	Na	64.28	Na
1999-00	833.85	898.13	Na	64.28	Na
% Change (82-83 to 90-91)	157 %	Na	85.71 %		
% Change (91-92 to 99-00)	41%	9.2%	43.32 %		

Source: 1.For COP – GOIa (2000), 2.For prices- Indore- Nagpur- Socio Economic Abstract,(GOM)

Note: 1.COP figure for the year 1997-98 is the state estimate, other estimates are given in GOIa (2000). 2.As the COP figures for the years 1998-99and 2000-01 are not available, the same are derived by taking average of the previous and the next year's figures and previous years for these years respectively.

3.3 Concluding Remarks

The secondary data shows that at the macro level, i.e. at the state level, area and production have been rising continuously in Maharashtra and hence apparently, cheaper imports of edible oils do not seem to have affected the same. Nevertheless, there is a slowdown in the growth rate of area and production (Table3.5). However, the limited data set does not permit any phasewise area response exercise. There is a possibility that the rise in the area and production (though at a slower pace) of soybean without being affected by prices is due to a few factors. Table 2.4 shows that firstly, the rate of increase in the area and production in case of Maharashtra is higher than that in Madhya Pradesh where in fact the data shows a marginal decline in both in the recent years. Secondly, in absolute terms, the area and production in Maharashtra are around only one fourth that of Madhya Pradesh. Thirdly, the oil/cake producing capacity is also less in Maharashtra. Thus, this means that Madhya Pradesh contributes bulk of the supply of soybean and Maharashtra contributes only a small percentage to total soybean supplied. It might be the case that with increasing demand for oil (as the NCAER estimates show), increasing import duties in the recent past

years (Appendix 1.1), marginally declining area and production in Madhya Pradesh is compensated by increasing area and production in Maharashtra. The prices of soybeans as in Maharashtra might not be getting affected on this background due to cheaper imports.

CHAPTER IV

PROFITABILITY OF SOYBEAN CULTIVATION IN THE CHANGING SCENARIO: ANALYSIS OF THE SURVEY RESULTS

4.1 Introduction

The state level picture apparently does not hint at any adverse effect of trade liberalisation on soybean cultivation in Maharashtra. We analyse the micro-level data, in this chapter to understand the farmers' responses to the impact of trade liberalisation. This being the focus of the study, an attempt was made to analyse the farm-level data and observe the changes, if any, in the profitability of soybean cultivation in the recent years in the selected regions. The data collected during the quick survey was analysed with the following objectives:

Firstly, to observe trends in area, production and yield of soybean and the competing crops of the sample households; Secondly, to calculate profitability of soybean as against the other crops and identify factors explaining the same and thirdly, identify factors explaining inter-household and inter-taluka differences in the above mentioned variables. The aggregate figures are also presented. We first describe the broad characteristics of the district chosen and then go on to the detailed characteristics of the villages and the households selected. Next, for calculating the profitability of soybean cultivation, vis-à-vis the competing crops, we choose various parameters and observe the direction and magnitude of change in the same during the survey period. Lastly, we analyse the perceptions of the households and soybean processing units regarding the ongoing process of trade liberalisation and try to relate it to the results obtained from the data analysis.

4.2 The Basic Characteristics

As mentioned earlier, district Nagpur contributes highest percentage to the total area under and production of soybean in Maharashtra. It can be seen from Table 4.1 that the area under oilseeds in Nagpur is higher than that under the foodgrains. Area under soybean is almost 40 percent of the GCA. This indicates the important place soybean occupies in the cropping pattern of the district. Table 4.2 presents compound growth rates of area, production and yield of soybean and its competing

crops in the district. Area under soybean is rising at a very high rate. Share of area under soybean is also very high as compared to that of other kharif crops. The rise in area under soybean is seen to be matched by a falling area under other important crops like kharif jowar and rice. However, share of area under soybean in Nagpur in total soybean area of the state is significantly falling which can be attributed to rising area under soybean in other regions of Maharashtra (this was noted from Table 2.3).

Table 4.1: Major characteristics of District Nagpur

(Rainfall in mm, Area in 000ha)

Characteristics	Value
1. Gross Cropped Area (1996-97)	640
2. Area Sown More than Once (1996-97)	82
3. Gross Irrigated Area (1996-97)	157
4. Average Rainfall (1996-97)	1147.5mm
5. Cropping Pattern (in 00 ha) (As in 1998-99)	
Rice	617
Kharif Jowar	545
Total Pulses	992
Total Foodgrains	2667
Cotton	565
Soybean	2533
Total Oilseeds	2868

Source : 1. Socio – Economic Abstract, District Nagpur, 1997-98, GOM
2. Districtwise Agricultural Statistical Information of Maharashtra, Part II, various years, GOM

Table 4.2: Compound Growth Rates of Area, Production and Yield under Kharif Crops in Nagpur from 1987-88 to 1998-99 (In percent p.a.)

	Area	Share of area in GCA (%) (1998-99)	Production	Yield
Soybean	19.04*	43	22.68*	6.04*
Cotton	-1.5*	9.6	-0.18	1.4
Kharif Jowar	-8.12*	9	-8.29*	0.32
Rice	-2.03*	5	-1.56	0.91
Soy.area in Nagpur / Soy.area in Maharashtra	-8.07*	-	-	-

Note: * =significance at 5%

The Talukas and the Villages: As mentioned earlier, two talukas were chosen, on the basis of extent of area under soybean. Taluka Umred is situated in the southern region of district Nagpur while taluka Narkhed represents the northern part of district. This particular taluka is situated near the border of the neighbouring major soybean producing state of Madhya Pradesh. A look at the village characteristics (Table 4.3

and Table 4.4) reveals that the two talukas constitute two different regions with different characteristics.

Table 4.3: Village Information: Taluka Umred (2000-2001)

Characteristics	Village 1- Udasa	Village 2- Heoti	Village 3 - Makardhokda
Total population (1991)	1613	1229	4308
Total no. of households	312	257	819
Total no. of landowners	169	163	524
Total geographical area (ha)	725.94	517.72	1946.23
Area under cultivation (ha)	Kh Total 296 712	Kh Total 387 759	Kh Total 830 1316
Area irrigated (ha)	310.84	300	251.73
Sources of irrigation	Canal, River	Canal	Canal, River
Major crops grown and area (ha)	Soybean-131, Chilli-37, Paddy-15, Tur-9	Soybean-300, Chilli-40, Paddy-24, Tur-14, Cotton-2, Kharif Jowar-2	Soybean-692, Kharif Jowar-71 Cotton-67, Tur-39, Paddy-2
Soy.area /Tot. kharif area (ha)	44 %	78 %	83%
Soy.area /Tot. Area (ha)	18%	40%	53%

Source: Office of Talathi and Gramsevak of the respective villages

Table 4.4: Village Information: Taluka Narkhed (2000-2001)

Characteristics	Village 1- Kharsoli	Village 2- Pipla	Village 3- Bhisnoor
Total population (1991)	2476	2150	3029
Total no. of households	485	413	250
Total no. of landowners	469	235	521
Total geographical area (ha)	1018.57	861.01	934.82
Area under cultivation (ha)	Kh Total 700 893	Kh Total 585 594	Kh Total 486 802
Area irrigated (ha)	182.40	80.00	175.00
Sources of irrigation	Well	Well	Well
Major crops grown and area (ha)	Soybean-328 Cotton - 233 Orange-159, Jowar -110, Tur-20, G.nut - 4, Udid-3, Moong-2, Other- 15	Soybean-285 Cotton- 147 G.nut-68, Jowar- 85 Orange- 80 Others- 16	Soybean-281 Jowar-100 Orange-98, Cotton-85 Tur 20
Soy.area /Total kharif area (ha)	47 %	49%	58 %
Soy.area /Total area (ha)	36 %	48 %	35 %

Source: Office of Talathi and Gramsevak of the respective villages

With the major source of irrigation as canal and river water, the area irrigated in the three villages of taluka Umred is higher than those in taluka Narkhed. Soybean is seen to be the major crop and the kharif cropping pattern is dominated by soybean in the former taluka. Cropping pattern in the villages of taluka Narkhed seems to be more diversified possibly to overcome any production risk as the area irrigated is

comparatively lower. The major source of irrigation in these villages is wells and the percent area under soybean in total kharif area is seen to be lower than the villages in Umred. The villages in each taluka seem to be broadly, homogeneous in these characteristics, though minor differences can be observed.

The Sample Households: The major characteristics of the sample households are mentioned in Table 4.5. Firstly, soybean was found to be the major and only crop for the marginal farmers in the sample households of Umred. The absence of a diversified cropping pattern in this taluka possibly can be attributed to the availability of canal irrigation, which ensures availability of adequate water in these villages. In case of Narkhed, the cropping pattern of the sample households is more diversified.

Secondly, it is seen from Table 4.5 that the average income of the sample households follows a particular pattern i.e. average income increases with the size of land holding class. The data also gives a rough estimate of relative economic status of the talukas. The higher levels of income received by the sample households in Umred indicate that, it is relatively a prosperous taluka than Narkhed. Thirdly, it is seen from the Table that the households in the first (marginal) category are the households which need to participate in the wage labour market (which is mainly casual in nature) as well as non farm employment for earning the wage income in both the talukas. The income from animal husbandry is received mainly by the middle and large category farmers which hints at the better asset (livestock) position of these households. Thus, the small / marginal farmers, who generally cultivate the kharif crop – soybean are more prone to labour market and production risks and they are more vulnerable to adverse effects, if any, of process of trade liberalisation.

The importance of soybean in these areas is revealed from the information on the usage of soy oil for the domestic purpose. The households in both the villages make use of soybean oil for cooking purpose. Assuming that the incomes would increase with time, there is potential for increase in the demand for oil. However, there is no one to one relationship that can be found between supply of and demand for soybean (from the processing industry) from this area.

Table 4.5: Characteristics of the Sample Households

Characteristics	Land Size Classes	Umred			Narkhed		
		V1	V2	V3	V1	V2	V3
1.No. of households with 100% area under Soybean	I	5	5	4	0	0	1
	II	4	2	4	0	0	0
	III	1	0	2	0	0	0
	IV	0	0	1	0	0	0
2.Average total income from cultivation (Rs)	I	48096	18259	27926	17450	25760	19750
	II	30230	34608	33746	46840	35978	26316
	III	124042	55864	41433	56170	112970	34068
	IV	292491	151555	210909	115150	128330	111670
3.No. of households receiving wage income in the labour market	I	3	4	4	4	3	5
	II	2	4	2	3	4	0
	III	1	1	3	0	0	0
	IV	0	0	0	0	1	0
4.No. of households receiving income from animal husbandry	I	0	0	1	0	0	0
	II	1	0	1	1	3	2
	III	1	1	3	3	1	1
	IV	3	2	2	1	5	4
5.No. of households receiving non-farm income	I	3	1	1	0	3	1
	II	0	0	0	2	1	0
	III	2	1	0	0	3	0
	IV	3	1	1	2	1	0
6.Average usage of Soybean Oil for cooking (in kg/year)	I	24.2	23.8	15.6	18	13.2	14.6
	II	19.6	21.6	13.6	16.8	19.4	13.2
	III	35.4	35.4	19.2	13.6	17.6	14.4
	IV	33.4	25.6	19.2	15.2	26.6	16.2

The farmers in taluka Umred region started cultivating soybean after mid 1980s whereas those in Narkhed for starting soybean cultivation was observed to have started soybean cultivation around 1990. The major reasons indicated were higher profitability of soybean, short duration and suitable climatic conditions. The reasons cited were similar in both the talukas. It was observed that during the period under study, the cropping pattern was maintained with a few exceptions. Sample households in Narkhed reported the practice of rotation of crops every year on their landholding for maintaining/improving the fertility of land. This was not reported by the farmers from Umred. The sample households observed that the years 1998-99 and 1999-00 were normal years for all households in all the villages in the two talukas. However, the last year (2000-01) though a normal year for villages in taluka Umred, proved to be a bad year for sample households in Narkhed due to lack of adequate and timely rains

With this background we move to the analysis of various indicators reflecting change, if any, in the profitability of soybean cultivation. The emphasis is more on the differences between the talukas, which are seen to be distinctly different in their characteristics.

4.3 Trends in Area, Production and Yield of Soybean cultivated by the Sample Households

We first note the trends (in the post liberalisation period i.e. over the survey period of three years) in area, production, productivity of soybean and other crops that are cultivated by the sample households and also the labour use therein. The results for soybean are presented in Table as 4.6 and are summarised in Table 4.6a. The results for other crops are presented in Appendix 4.1.

Table 4.6a: Area, Production and Yield of Soybean Cultivated by the Sample Households in the Two Talukas

Variable	Land Size Class									
	I		II		III		IV		Total	
Area (In ha)										
	Avg	% Change	Avg	% Change	Avg	% Change	Avg	% Change	Avg	% Change
Umred	0.75	3.33	2.01	0	3.7	5.61	9.91	10.01	4.09	4.74
Narkhed	0.28	0.00	0.72	-13.11	1.48	0.00	3.85	-12.78	1.58	-6.47
Total	0.52	1.67	1.37	-6.56	2.59	2.81	6.88	-1.39	2.84	-0.87
Share in Total Cultivated Area (In %)										
Umred	98.46	16.67	91.76	0.00	81.43	11.54	82.43	27.1	88.52	13.83
Narkhed	54.26	0.00	40.36	-13.11	38.12	-5.18	41.13	-13.57	43.47	-7.97
Total	76.36	8.34	66.06	-6.56	59.78	3.18	61.78	6.77	65.99	2.93
Total Produce (In qtl)										
Umred	12.63	33.22	31.17	36.21	45.93	43.64	155.53	86.86	61.32	49.98
Narkhed	2.72	21.62	5.87	-5.33	11.6	-3.19	32.53	-3.09	13.18	2.50
Total	7.68	27.42	18.52	15.44	28.77	20.23	94.03	41.89	37.25	26.24
Yield (In qtl/ha)										
Umred	16.52	28.41	15.56	36.21	12.91	38.23	15.5	61.53	15.12	41.10
Narkhed	10.27	21.62	8.13	10.95	8.13	-3.19	8.42	10.93	8.74	10.08
Total	13.40	25.02	11.85	23.58	10.52	17.52	11.96	36.23	11.93	25.59
Labour use – Hired Labour (In mandays per ha)										
Umred	23.85	17.33	21.97	4.32	30.51	14.63	40.64	7.47	29.24	10.94
Narkhed	74.54	4.51	70.36	6.44	62.38	28.54	55.83	3.15	65.78	10.66
Total	49.20	10.92	46.17	5.38	46.45	21.59	48.24	5.31	47.51	10.80
Labour use – Family Labour (In mandays per ha)										
Umred	48.39	4.88	35.84	4.79	20.75	0.73	9.68	-11.17	28.67	-0.19
Narkhed	70.4	0.00	44.36	4.92	21.39	7.42	17.35	10.05	38.38	5.60
Total	59.40	2.44	40.10	4.86	21.07	4.08	13.52	-0.56	33.52	2.70

Note: 1. Average for the size class is calculated for the year 2000-01. 2. % change is calculated for the period 1998-99 to 2000-01.

Table 4.6b: Area, Production and Yield of Soybean Cultivated by the Sample Households in the Two Talukas– the Summary Description

	Umred	Narkhed
Area and share of area	Area as well as share of area under Soybean maintained / increasing for classes I and II (who cultivate only Soybean) and increasing over the period for classes III and IV. Area under crops like Chilli, Cotton, Tur which are mainly cultivated by larger size classes is seen to be generally falling.	Area as well as share of area under Soybean is maintained for the small size classes, however, falling generally for the higher classes. Absolute area under Soybean is seen to be less than Umred for all classes. Area under other crops like, Cotton, Tur on the whole, increasing.
Total production	Production is increasing over the period for Soybean for all size classes; the extent of % change is increasing with the size class. For other crops, generally falling for larger classes.	Production is decreasing over the period marginally for Soybean except for size class I. Absolute value lower than Umred. For other crops, it staying constant or increasing.
Yield	For Soybean yield is increasing over the period at a faster rate for than other crops and the extent of % change increasing with the size class.	Yield is generally increasing over the period for Soybean. Absolute value lower than Umred. For other crops, % change is seen to be positive generally.
Hired Labour use	Total mandays of hired labour per ha are increasing with land size for soybean. Generally falling at for other crops at some places.	In contrast to Umred, mandays of hired labour are falling with the size of landholding. Absolute value is greater than Umred for all size classes. % change is positive for all classes. For other crops, % change is positive..
Family Labour use	Family labour mandays are falling with the land size. For higher size classes % change is very low / negative. Falling at places for other crops.	Family Labour days are falling with the size class; absolute value is greater than Umred. % change is positive. Constant /declining over the period for Soybean.

It can be seen from the Tables 4.6 and 4.7 that the area as well as share of area under soybean is higher in the case of Umred as was also noted earlier. The area under soybean in this taluka is seen to be remaining constant or increasing as against Narkhed where the trend is towards a decline. The corresponding figures for other crops are seen to be positive in Narkhed. Similar picture is noted for production and yield of the crops in the respective talukas. Production of soybean is seen to be positive and increasing in Umred. It was noted that soybean cultivation suffered a setback mainly because of the seasonal factors and increasing costs of soybean cultivation in Narkhed. The labour use pattern in both the talukas reveals some interesting points and brings out the inter taluka differences in profitability of soybean cultivation. Tables 4.6a and 4.6b indicate increasing hired labour use per hectare over the period in both the talukas. However, in Narkhed, the labour intensity is seen to be

much higher than Umred and is lower for higher land size classes as against Umred. In the case of family labour too, the mandays per hectare are greater in Narkhed than in Umred for classes I and II. Thus in Umred there seems to be increasing dependence on hired labour. The trend is towards using more family labour, especially in case of large farmers in Narkhed. It was noted that the share of wage bill in the total cost was higher in Narkhed than Umred (where it was around one fourth of the total cost for all the classes) and was increasing with the land size class. This might be indicative of changing preference of the large farmers for other crops in Narkhed possibly to economise on the wage bill.

On the whole, area under soybean does not show wide fluctuations as against the fluctuations in production and yield which are determined largely by seasonal factors in the respective talukas. The data indicates relative profitability of soybean cultivation vis-a-vis other crops in Umred. Increasing share of area under soybean for higher land holding classes, increasing production, yield and labour use indicate this. Larger farmers are changing their cropping pattern in favour of soybean. This might mean that the profitability has not been affected due to the changes in market prices, which in turn are likely to get affected by changing prices of the final produce – soybean oil in this case. Narkhed presents a different picture indicating falling profitability of soybean as against the competing crops due to the seasonal factors. Here too, larger farmers are observed to be changing their cropping pattern in favour of other crops. The year 2000-01 was particularly bad for this taluka and hence a trend towards decline in the area and production is noted. However, the marginal farmers have maintained the area under soybean.

The aggregate effect is seen to be getting affected by the extent of change in the concerned variables in either of the two talukas. Thus, the total area is seen to have declined marginally basically due to the declining area under soybean in Narkhed. However, the percentage increase in share of area under soybean is positive, basically due to increasing share of area under soybean in Umred. Other indicators like total produce and total yield have also increased. Here, the cultivators belonging to land size class IV exhibit high percentage of output and yield increases. Thus, larger farmers are seen to be showing preference for soybean cultivation at the aggregate level. As far as labour use is concerned, for all size classes, use of hired

Labour shows a positive increase indicating increasing labours productivity per hectare.

For identifying factors behind the existing trends in area, production and productivity of soybean and the inter taluka differences, it is necessary to understand the relative profitability of various crops. The impact of trade liberalisation, if any, through prices of edible oil can be analysed in this case.

4.4 Profitability of Soybean Cultivation in the Sample Households

In this section, we analyse various parameters for observing the economics of soybean cultivation (Tables 4.7a and 4.7b) and the changes as compared to the other crops (Appendix 4.2) in it in the post liberalisation period i.e. during the study period. Liberalisation of trade in edible oil is expected to affect soybean cultivation basically through prices. The prices of soybean as received by the sample households of both the talukas are presented in figure 4.1 and 4.2. It can be seen that the average price received by the households of various land sizes classes have increased in the year 2000-01 in case of both the talukas. In Narkhed, the rise in the year 2000-01 is attributed to crop failure and supply shortage due to erratic monsoon. The market for soybean in the villages of this taluka are local and hence supply shortages led to the price rise. This is also reported in Table 4.10. To start with, we observe the ratio of price (received) of soybean to that of each of the competing crops. As Table 4.7a shows, the price ratio is generally found to be less than one except for some crops and are falling over the period. Thus, the relative price of output may not necessarily indicate the relative profitability of the crops concerned. Therefore, we have to consider the input prices i.e. the costs also. An exercise was carried out to calculate the net return-NR received after adjusting for the paid-up costs from the gross value of output-GVO. For calculating the NR, GVO was found out taking data relating to the total produce and the price received by the sample household for the produce in the market. Similarly, total cost of production was calculated using all the paid up cost i.e. costs A. The difference between the two was the 'Net Return'. Thus,

$$\text{Net Return (NR)} = \text{Gross Value of Output (GVO)} - \text{Paid up Costs}$$

As can be expected on the background of generally increasing area and production in Umred and declining in Narkhed, the NR per hectare is higher and

Figure 4.1 : Average Price of Soybean Received by the Respondent Households - Taluka Umred

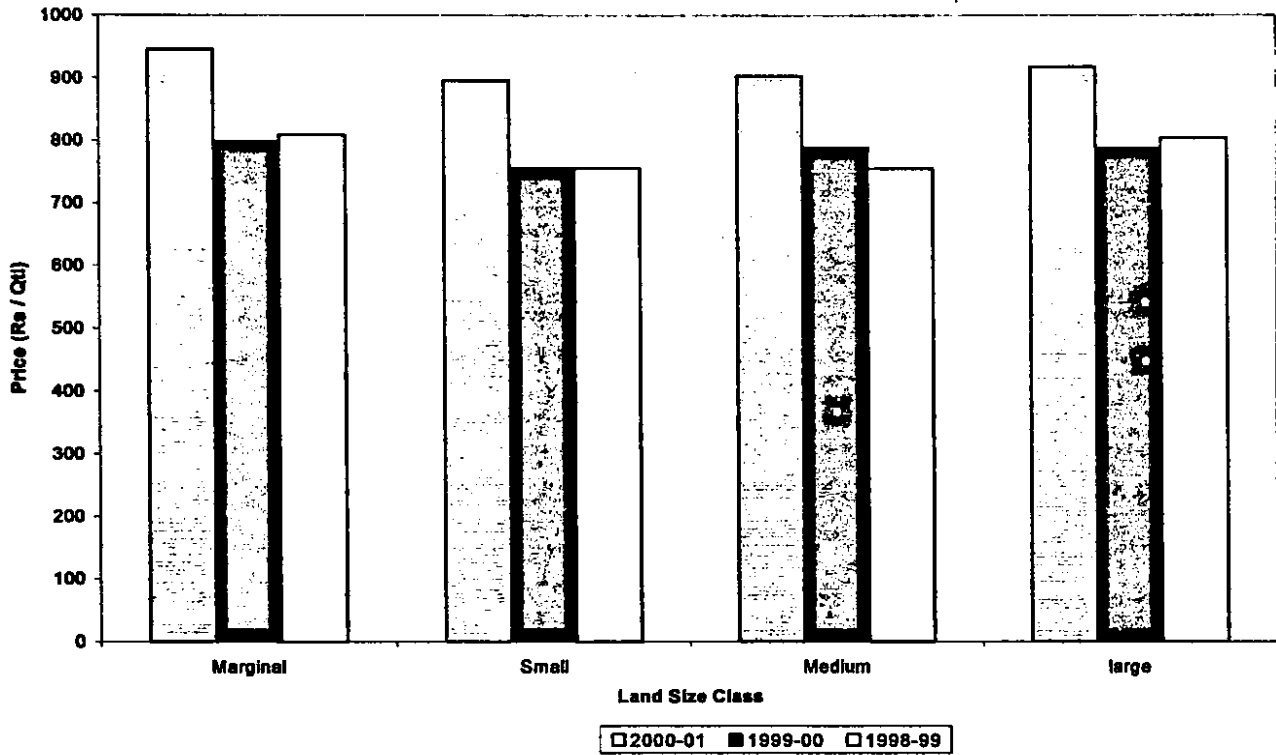
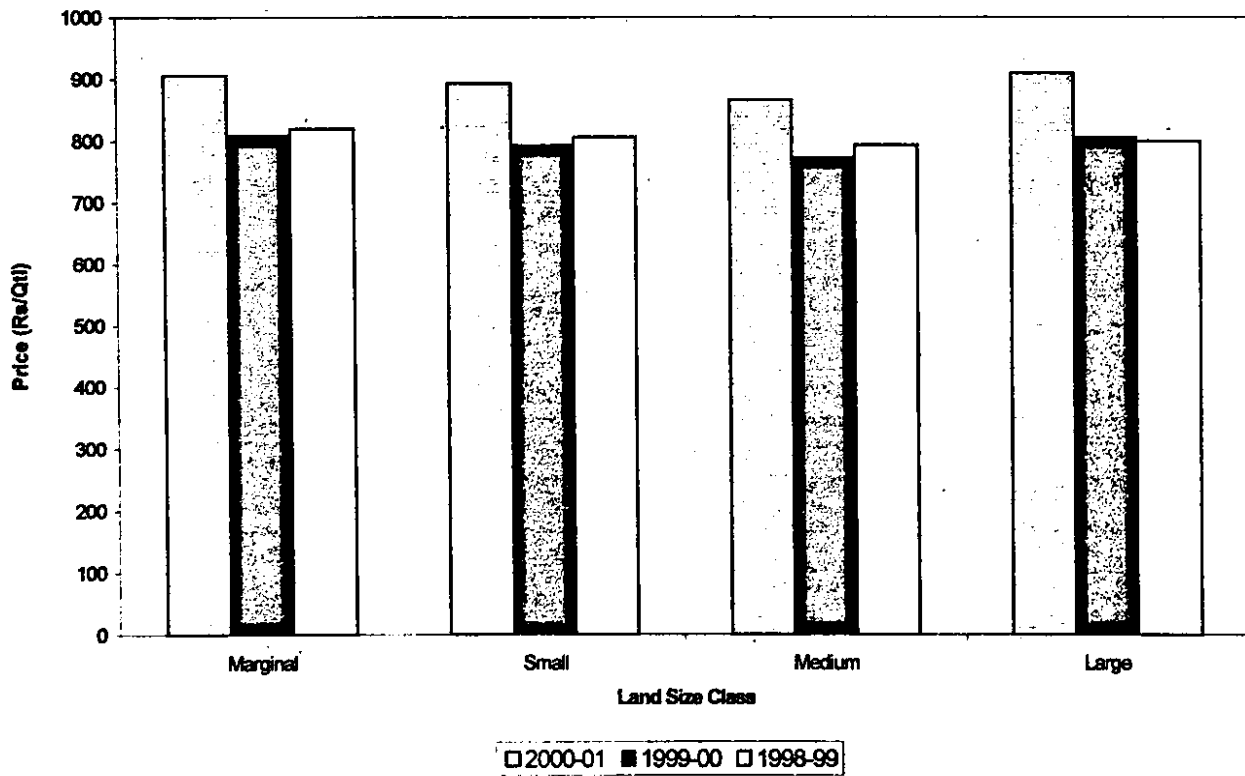


Figure 4.2: Average Price of Soybean Received by the Respondent Households - Taluka Narkhed



increasing over the years for the former taluka. However, it is less than other crops at places. e.g. per hectare NR for the competing crop, particularly chilli is higher than that of soybean. For Narkhed also, wherein NR per hectare is seen to be comparatively lower than Umred, competing crops particularly, groundnut and cotton are seen to be more profitable for all the households. Similar picture is indicated by other parameter such as NR per unit of production (NR/quintal) and total cost of cultivation (TCC) per unit of production (TCC/quintal)

Thus, the price ratio and the NR calculations do not convincingly represent profitability of soybean cultivation. Therefore, another exercise was carried out for understanding high incidence of soybean cultivation. Proportion of NR to GVO was calculated for all the crops. However, this also does not convincingly indicate relative profitability of soybean in both the talukas. Finally therefore, GVO and NR of the crops was adjusted for getting per capita and per month values. Firstly, GVO and NR were adjusted by number of family members of the households to get per capita GVO and per capita NR. These were found to be very high for soybean than for other crops for Umred as against Narkhed. Next, assuming that the whole of the kharif season consists of six months and that the income from kharif cultivation gets spread over these six months, per (kharif) month GVO and NR were calculated. Again, for Umred, these were very high as compared to the other crops. However, this was not the case for Narkhed. Lastly, shares of crops in total GVO and total NR were also found out. Similar picture emerged in this case too. The calculations clearly show that soybean cultivation is found to be very profitable due to its high share in total GVO and total NR and its potential to get one time payment 3-3.5 months after the crop was sown in Umred. Thus, shorter duration of the crop and its high share in total GVO was the major reason for cultivating/maintaining the soybean crop in Umred. In Narkhed, soybean crop is seen to be losing its popularity due to the crop failures. Higher soybean prices in the year 2000-01 do not seem to have compensated for the loss in the output.

Table 4.7a: Various Indicators of Profitability of Soybean Cultivation

Variable	Land Size Class									
	I		II		III		IV		Total	
I. Price Ratio	Avg	% Change	Avg	% Change	Avg	% Change	Avg	% Change	Avg	% Change
Umred										
Soy/Pdy	-	-	1.59	24.06	0.00	0.00	1.31	-44.06	0.97	-6.67
Soy/Chilly	-	-	0.45	9.54	0.42	6.94	0.54	15.17	0.47	10.55
Soy/Cot	-	-	-	-	0.49	0.00	0.41	-20.94	0.45	-10.47
Soy/Tur	0.88	-12.50	0.51	30.78	0.23	17.97	0.40	-25.56	0.51	2.67
Narkhed										
Soy/G.nut	-	-	0.75	-6.25	0.78	5.06	0.75	-3.13	0.76	-1.44
Soy/Cot	0.45	0.04	0.46	-10.16	0.46	-3.40	0.45	-1.00	0.46	-3.63
Soy/Jowar	2.25	1.56	2.28	-3.89	2.15	5.02	2.28	7.50	2.24	2.25
Soy/Tur	0.87	6.32	0.82	2.27	0.77	1.20	0.81	3.82	0.82	3.40
Soy/Mug	-	-	1.00	0.00	1.13	-10.00	1.22	21.88	1.12	3.96
Soy/Udid	-	-	1.13	12.50	0.90	-10.00	1.03	9.06	1.02	3.85
Total										
Soy/Pdy	-	-	1.59	24.06	0.00	0.00	1.31	-44.06	0.97	-6.67
Soy/Chilly	-	-	0.45	9.54	0.42	6.94	0.54	15.17	0.47	10.55
Soy/G.nut	-	-	0.75	-6.25	0.78	5.06	0.75	-3.13	0.76	-1.44
Soy/Jowar	2.25	1.56	2.28	-3.89	2.15	5.02	2.28	7.50	2.24	2.55
Soy/Mug	-	-	1.00	0.00	1.13	-10.00	1.22	21.88	1.12	3.96
Soy/Udid	-	-	1.13	12.50	0.90	-10.00	1.03	9.06	1.02	3.85
Soy/Cot	0.45	0.04	0.46	-10.16	0.48	-1.70	0.43	-10.97	0.45	-7.05
Soy/Tur	0.88	-3.09	0.67	16.53	0.50	9.59	0.61	-10.87	0.66	3.04
2. NR per ha (In Rs / ha)										
Umred	10651.25	67.02	9235.76	114.37	7630.28	106.78	9624.96	266.36	9285.56	138.63
Narkhed	1676.27	-63.33	1103.94	-31.72	2753.51	-40.48	2446.97	-53.18	1995.17	-47.18
Total	6163.76	1.85	5169.85	41.33	5191.90	33.15	6035.97	106.59	5640.37	45.73
3. NR ratio										
Umred										
Soy/Pdy	-	-	2.48	-39.67	-2.16	60.06	-1.75	-8.69	-0.48	3.90
Soy/Chilly	-	-	0.34	-3.03	0.82	-6.12	0.53	261.02	0.56	83.96
Soy/Cot	1.79	0.00	0.38	326.42	-1.30	109.52	-3.03	13.17	-0.54	112.28
Soy/Tur	-	-	-	-	1.66	-100.00	3.04	33.37	2.35	-33.32
Narkhed										
Soy/G.nut	-	-	-0.22	-25.26	0.36	-82.00	1.43	-159.89	0.52	-89.05
Soy/Cot	0.09	8.29	0.09	-41.55	0.24	-16.72	0.16	-234.29	0.15	-71.07
Soy/Jowar	-1.81	-240.86	1.02	183.37	7.55	-266.19	-5.56	-328.41	0.30	-163.02
Soy/Tur	1.64	41.93	-0.16	-84.93	0.58	-85.13	2.00	175.63	1.02	11.88
Soy/Mug	-	-	-0.64	-24.82	0.94	-44.67	9.14	-210.59	3.15	-93.36
Soy/Udid	-	-	-0.49	-81.69	1.54	-62.87	18.05	176.91	6.37	10.78
Total										
Soy/Pdy	-	-	2.48	-39.67	-2.16	60.06	-1.75	-8.69	-0.48	3.90
Soy/Chilly	-	-	0.34	-3.03	0.82	-6.12	0.53	261.02	0.56	83.96
Soy/Mug	-	-	0.64	24.82	0.94	44.67	9.14	210.59	3.57	93.36
Soy/Udid	-	-	0.49	81.69	1.54	62.87	18.05	176.91	6.69	107.16
Soy/G.nut	-	-	0.22	25.26	0.36	82.00	1.43	159.89	0.67	89.05
Soy/Cot	0.94	4.15	0.24	142.44	-0.53	46.40	-1.44	-110.56	-0.20	20.61
Soy/Tur	1.64	41.93	-0.16	-84.93	1.12	-92.57	2.52	104.50	1.68	-10.72
Soy/Jowar	-1.81	-240.86	1.02	183.37	7.55	-266.19	-5.56	-328.41	0.30	-163.02

4. Ratio of Net Return to Total Produce (In Rs /qtl)										
Umred	608.84	25.57	570.35	47.82	582.42	33.14	614.85	68.79	594.12	43.83
Narkhed	143.90	-51.81	127.00	-36.45	336.59	-27.32	279.92	-58.5	221.85	-43.52
Total	376.37	-13.12	348.675	5.685	459.505	2.91	447.385	5.145	407.98	0.155
5. Ratio of Total Cost of Cultivation to Total Produce (In Rs /qtl)										
Umred	339.83	17.52	321.13	23.01	324.85	22.27	302.81	2.83	322.16	16.41
Narkhed	753.13	-4.94	766.34	3.56	521.51	7.29	634.24	-0.78	668.81	1.28
Total	546.48	6.29	543.74	13.29	423.18	14.78	468.53	1.03	495.48	8.85
6. Share of Net Return in Gross Value of Output (In percentage)										
Umred	0.64	4.61	0.64	20.81	0.64	10.48	0.67	39.43	0.65	18.83
Narkhed	0.16	-56.04	0.14	-41.43	0.39	-28.8	0.30	-66.05	0.25	-48.08
Total	0.40	-25.72	0.39	-10.31	0.52	-9.16	0.49	-13.31	0.45	-14.62
7. Gross Value of Output per family member (In Rs)										
Umred	2809.26	60.02	6608.3	63.86	6939.06	72.59	21692.53	123.33	9512.29	79.95
Narkhed	527.92	34.24	1039.81	4.26	1863.2	3.66	4613.15	10.95	2011.02	13.28
Total	1668.59	47.13	3824.06	34.06	4401.13	38.13	13152.84	67.14	5761.65	46.61
8. Gross Value of Output per month (In Rs)										
Umred	2039.72	60.02	4715.62	63.86	6909.59	72.59	23780.09	123.33	9361.26	79.95
Narkhed	406.23	34.24	870	4.26	1675.56	3.66	5010.56	10.95	1990.59	13.28
Total	1222.98	47.13	2792.81	34.06	4292.58	38.13	14395.33	67.14	5675.92	46.61
9. Net Return per Family Member (In Rs)										
Umred	1919.80	73.09	4114.27	114.37	4565.99	96.09	14936.66	402.48	6384.18	171.51
Narkhed	110.68	-63.33	216.69	-32.22	729.08	-24.59	1563.29	-9.69	654.94	-32.46
Total	1015.24	4.88	2165.48	41.08	2647.54	35.75	8249.98	196.40	3519.56	69.53
10. Net Return per Month (In Rs)										
Umred	1366.56	73.09	3136.17	114.37	4523.92	96.09	16334.03	402.48	6340.17	171.51
Narkhed	63.84	-63.33	190.49	-32.22	665.03	-24.59	1712.11	-9.69	657.87	-32.46
Total	715.20	4.88	1663.33	41.08	2594.48	35.75	9023.07	196.40	3499.02	69.53
11. Share of GVO of the Crop in Total GVO (In Percentage)										
Umred	99.00	1.84	88.68	1.61	73.67	27.19	76.83	48.59	84.55	19.81
Narkhed	47.29	14.63	34.1	-6.48	28.43	-17.57	33.87	-13.34	35.92	-5.69
Total	73.15	8.24	61.39	-2.44	51.05	4.81	55.35	17.63	60.23	7.06
12. Share of NR of the Crop in Total NR (In Percentage)										
Umred	99.04	1.81	87.51	11.45	72.69	32.34	76.8	171.37	84.01	54.24
Narkhed	-8.36	70.72	36.59	-3.67	22.67	-47.61	27.35	-46.24	19.56	-6.70
Total	45.34	36.27	62.05	3.89	47.68	-7.64	52.08	62.57	51.79	23.77

Note: Same as in Table 4.6a

Table 4.7b: Various Indicators of Profitability of Soybean Cultivation -the Summary
Description

Variable	Umred	Narkhed
1.Price Ratio	Generally less than one (except for Paddy) with Chilli, Cotton and Tur and falling over the period.	Generally less than one (except for Jowar, Udid) with Cotton Groundnut and Tur and falling over the period.
2.NR/ha-soy	Positive and increasing over the period for all classes. % change is higher for higher size classes. However, less than other crops at places.	Positive but falling over the period for all the classes. Absolute value less than that of Umred.
3.NR-soy/ NR-cc	Generally less than 1 and falling at places over the period.	Generally less than 1 and falling at places over the period.
4.NR-soy/ Total Produce	Increasing over the period for all the classes. Less than that for other crops like Chilli, Cotton.	Absolute value for all classes less than Umred and falling over the period. Less than that for other crops except Jowar
5.TCC/ Total Produce	Generally comparable for all the crops. Increasing over the period for all classes.	Generally comparable for all the crops. Slightly falling at some places. Absolute value is higher than Umred.
6.NR-soy/ GVO-soy	Generally higher for larger size classes and increasing over the period.	Generally higher for larger size classes and falling for all the classes. Absolute value for all classes less than Umred
7.NR-cc/ GVO-cc	Absolute value greater than for Soybean at some places and falling with time at places.	Absolute value greater than for Soybean at some places and falling with time at places.
8.GVO-soy/ no. of family members	Generally very high as compared to Chilli and Cotton. Increasing with size class and time-at a faster rate than other crops	Generally comparable or lower than cotton. Increasing with size class, falling at places unlike other crops. Absolute value less than Umred
9.GVO -soy per month	Very high as compared to the CC and increasing at a faster rate than CC.	Comparable with CC except cotton (for which it is higher) falling at places unlike CC. Absolute value less than Umred
10.NR-soy/ no.of family members	Higher for Soybean. Increasing with size class and time-at a faster rate than CC.	Very high for CC like cotton as compared to Soybean for which, falling at places. Absolute value less than Umred
11.NR- soy per month	Higher than and increasing with time-at a faster rate than CC	Lower than for cotton, falling at places. Absolute value less than Umred
12.GVO-crop/ Total GVO	Generally more than 60% for Soybean. Generally increasing with time for Soybean and falling for other crops.	Share of Soybean comparatively lower,(between 20-100%) than major CC like Cotton and Ground nut. Reflects diversified cropping pattern.
13.NR-crop/ Total NR	Higher for Soybean. Generally increasing with time unlike CC.	Lower than CC like cotton, falling at places.

Note: 1.The term absolute value refers to absolute value in the year 2000-01. 2.The term 'at some places' refers to some size classes. 2.CC=competing crops.

The larger land size classes in both the talukas have a comparatively diversified cropping pattern than the lower land size classes. In case of Umred for larger farmers, area and share of area under soybean is increasing. Similarly, per capita and per (kharif) month GVO as well as NR are increasing at a faster rate for these classes. Thus, profitability of soybean cultivation is increasing and the larger farmers are changing their crop pattern in favour of soybean. Soybean prices received are rising (through not the relative price) and do not seem to have got affected by the cheap imports of edible oils. Narkhed presents exactly opposite picture. Though soybean prices received are rising, farmers especially the larger farmers are changing their cropping pattern in favour of the competing crops. They have expressed their preferences towards other crops though reducing area under and share of soybean. It can be said that it is not the prices (of imported oil), but nature that governs the production, that has reduced the profitability of soybean cultivation in Narkhed, as is clear from various profitability parameters.

At the aggregate level, the indicators such as proportion of NR to TP, TC/TP and NR/GVO seem to be exhibiting an unfavourable picture in case of soybean. However, the other variables clearly indicate profitability position of soybean. The indicators convey positive sign and show increase over the survey period. Taluka Umred thus dominantly affects the aggregate profitability figures

4.5 Trade Liberalisation: Perceptions of the Sample Households

The perceptions of the households were mainly sought on the issue of impact of government policy relating to domestic support to the soybean cultivators and of trade liberalisation. Import liberalisation was expected to affect adversely, the oilseed prices received by the farmers. The question relating to the government support was specifically put to know the support offered by the government in case of the adverse effects, if any, of trade liberalisation.

It can be seen from Table 4.8 that majority of the households in both the talukas have not received support of any kind by the government in the recent years. However, some of the farmers have reported that they received seeds, free of charge

Table 4.8: Government Support Received by the Sample Households

Type of Government Support Received	Umred			Narkhed		
	V1	V2	V3	V1	V2	V3
1. Support prices	-	-	-	-	-	5
2. Subsidies and distribution of seeds	8	2	2	4	5	5
3. Marketing	-	-	1	-	-	-
4. No support	12	18	17	16	15	10
Total	20	20	20	20	20	20

from the government when they experienced crop failure during the study period at no point of time. The option of buying the produce at MSP was not used by the government, during the survey period, as there was no need for such an action. The prices of soybean sold by the households did not experience any drastic fall below the MSP during the survey period in these regions.

The question relating to the direction of price change was also put forth for linking it to the trade policy changes (Table 4.9). Most of the households in each village of the two talukas reported that the prices received (of soybean) were rising over a period of time. Majority of the households attributed it to the increasing gap between increasing demand for soybean oil and the supply of oil (oilseeds) that fell short of the demand due to mainly the seasonal factors. It was found that the change in prices received was more in case of Umred than in Narkhed this is also clear from Figures 4.1 and 4.2. One of the reasons for this might be the channel of marketing of the produce (Table 4.10).

It can be seen that majority of the respondents in Narkhed have sold the produce to the traders within the village. On the other hand, in Umred half of the respondents are found to be selling their produce to the Krishi Samiti. It was found that the taluka place was known for a big market of soybean.

Table 4.9: Reasons for Increasing Price of Soybean Received by the Sample Households

Reasons	Umred			Narkhed		
	V1	V2	V3	V1	V2	V3
1. Increasing cost of inputs	3	1	2	1	-	-
2. Increasing demand for oil	3	4	3	-	-	-
3. Lower prod. in other talukas/ High demand, low prod	6	9	7	19	20	19
4. Do not know	5	5	7	-	-	1
Total	17	19	19	20	20	20

Note: The total in Umred does not add up to 20 as the responses were 'not increasing'

Table: 4.10: Marketing of Soybean by the Sample Households

Produce marketed to -	Umred			Narkhed		
	V1	V2	V3	V1	V2	V3
1. Oilmills	-	-	-	-	-	-
2. Krishi Samiti	10	10	18	3	3	7
3. Trader	10	10	2	17	17	13
Total	20	20	20	20	20	20

Response of the households in the two talukas to the question relating to the impact of rising soybean price differed considerably (Table 4.11). Majority of the

Table 4.11: Knowledge / Perceptions of the Households Regarding Impact of Rising Soybean Prices

Opinions	Umred			Narkhed		
	V 1	V 2	V 3	V 1	V 2	V 3
1.Area under Soybean will increase	10	7	11	-	-	-
2.Will continue with Soybean cultivation	3	4	3	2	-	-
3.Income/profits will increase	2	5	3	-	3	-
4. Area under Soybean will increase if subsidies, support prices provided	3	-	-	-	-	-
5. Will shift to a new crop due to increasing cost of cultivation of Soybean	1	-	-	7	13	11
6.No clear answer	1	4	3	11	4	9
Total	20	20	20	20	20	20

households in Umred thought that if the price rise continues, area under soybean would either increase or will be maintained. However households in Narkhed were more concerned about increasing cost of soybean cultivation though the price of soybean is rising in the recent years. These households thus seem to be more concerned about relative net return in soybean cultivation.

Finally, perceptions of the households about reduction in import duties was sought (Table 4.12). The households in Narkhed seem to be aware of the ongoing process of trade liberalisation and the likely impact of cheap imports of edible oils. Majority of the households in this taluka replied positively to the concerned question. However, only around 50 percent of the households in Umred seem to be aware of the increasing imports and tariff reduction. The awareness of farmers in Narkhed possibly could be attributed to proximity to the neighbouring state of Madhya Pradesh and access to information. Hence, their responses to the relevant questions can be taken to be based on the information they have, which is not necessarily true for the households in Umred. However, as far as the impact of trade liberalisation is

concerned, the reactions are mixed and there seems to be ambiguity regarding the same. The major point to be noted is that almost half of the households in Umred and all the households in Narkhed reported that in the case of a fall in soybean prices due to the imports, they would shift to the competing crops. Thus, area under soybean would fall in such case.

Table 4.12: Perception of the Sample Households Regarding Trade Liberalisation and its Impact

Particulars	Umred			Narkhed		
	Yes	No	CNS	Yes	No	CNS
1. Knowledge about reduction in import duties	27	33	-	52	8	-
2. Whether it will lead to -						
a. More imports of edible oil	56	4	-	54	1	5
b. Reduction in domestic prices of edible oil	60	-	-	14	42	4
c. Therefore less income to the cultivators	58	2	-	51	5	4
d. Would grow alternative crops	29	31	-	60	-	-
e. If yes, which crops?	Cotton Tur, Chilly			Cotton, Tur, Jowar G.nut		
f. Whether alternative crops would be remunerative	48	12		60	-	
g. Whether technology of cultivation would be changed	53	7		57	3	
h. Whether it will be						
a. New seed variety	8			22		
b. Capital intensive	0			2		
c. Less inputs	2			21		
d. All of above	5			-		
e. Do not know	45			2		
i. Whether it would lead to unemployment	44	3		16	4	

Note: CNS= can not say

4.6 Responses of the Soybean Processing Units

As mentioned earlier, though several processing units were contacted, only three units, located in the north-eastern part of the state could respond back. We analyse the responses of these units. Table 4.13 presents the information relating to the units chosen and their responses.

A few striking points are revealed from the available data on the processing units. Firstly, the prices of soybeans used as inputs in these units is seen to be generally increasing over a the concerned period. Thus, the costs are increasing. Secondly, the prices received for the final output-soybean oil is seen to be fluctuating and have fallen in the year 1999-2000. Thirdly, however, the production of oil does not seem to have affected due to this i.e. due to high seed cost and fluctuating / falling output price. Moreover, output does not seem to have been affected due to non-

availability of enough seed supply /supply of poor quality seeds as is reported by the units. Thus, it might be the case that the increasing total sales have overcome the adverse effect of falling prices of oil. Another point to be noted is that they receive the supply of soybeans for processing from within the state. It is already noted that they face shortages of this raw material and have excess of capacity.

Table 4.13: Trade Liberalisation and the Soybean Processing Units

Characteristic	Unit 1		Unit 2		Unit 3	
1.Location	District Yeotmal		District Chandrapur		District Nagpur	
2.Year of establishment	1996		1996		1994	
3.Crushing capacity (mt/day)	225		200		700	
4.Capital invested(Rs)	8 crores		9.33 crores		16.66 crores	
5.Workers employed	T	P	T	P	T	P
1997-98	70	45	-	60	-	192
1998-99	70	45	-	60	-	146
1999-00	71	45	-	60	-	131
6.Average price paid for the Soybean (Rs/ mt)						
1997-98	7500		-		10689	
1998-99	8590		8990		8681	
1999-00	9000		8580		7867	
2000-01	9500		11000		9432	
7.Average price received for oil (Rs/kg)						
1997-98	21*		-		27.88	
1998-99	20*		37		34.55	
1999-00	21*		26		25.07	
8.Production of oil (M.T)						
1997-98	20000		24900		6409	
1998-99	45000		64630		101123	
1999-00	45000		101160		13126	
% change from 1997-2000	125 %		306 %		104%	
9.Source of supply of seeds	Own farm and wholesaler -within the state		Wholesaler -within the state		APMC market yard -within state	
10.Disposal of the produce	Within, outside the state.		Within the state.		Within ,outside the state.	
11.Reasons for non utilisation of the existing capacity	Non-availability of Soybean		Problems faced in the first year of the installation		Poor quality , Non-availability of Soybean	
12.Reasons for difficulties faced, if any, in product disposal	Excess imports, lower price received for the produce.		Cheap imports, low sale price, High seed cost		Cheap imports.	
13.Likely impact of trade liberalisation						
1.Good:Possibility of export of Soycake/meal	Yes		No		Yes	
2.Bad : Possibility of low profits /unemployment / closure	Yes		Possibility of adverse effects		Possibility of adverse effects	

Note: 1. T= temporary, P =permanent 2. * =The price is comparatively lower being an industrial input

If we assume that all the processing units in the state generally face such a situation then this indicates, a potential for the soybean sector to grow further in terms of area and production of soybean. Relating this situation to the trends in area and production of soybeans in Maharashtra, we possibly can say that these (trends) can be explained in terms of growing (domestic) market for the oil and growing exports of soybean cake /meal.

As far as their perceptions regarding trade liberalisation are concerned, they seem to be mixed. The units seem to be hopeful about possibilities of exports of soy cake/meal. However, they also seem to be concerned about adverse implications of lower tariff rates and imports of cheap edible oil in the country.

4.7 Concluding Remarks

The data collected was analysed with the objective of understanding the impact, if any, of trade liberalisation on the soybean cultivation at the village level. The data was analysed firstly on the basis of trends in area, production and productivity of soybean and secondly by calculating the profitability of soybean cultivation and changes observed in the same during the survey years. Thirdly, the perceptions of the respondents were also analysed.

The two selected talukas were heterogeneous regions in terms of broad features of the agricultural sector. The three-year data collected presents two different pictures of economics of soybean cultivation. Table 4.7 clearly presents the same. Prices of imported edible oil (through their impact on demand for soybeans) do not seem to have affected prices of soybeans and its relative profitability. Constant/increasing area under soybean and its increasing profitability in Umred is attributed to good monsoon in this region vis-à-vis other regions. Soybean cultivation is clearly seen to be profitable due to its shorter duration and lesser costs in terms of irrigation, application of fertilisers, insecticides/pesticides, supervision etc. Majority of the respondents expressed the opinion that soybean prices were rising in recent years and that the area under the crop would be maintained. Narkhed presents a different picture. Though majority of the households maintained that soybean prices were rising, they were concerned about the crop failures and declining trend in

production in recent years. Thus the households were not able to recover the costs from the income received. Therefore, NR was seen to be negative at some places. The likely impact of trade liberalisation is expected to be captured in terms of declining trend in edible oil prices and adverse effect on soybean cultivation. However, the indicators reveal adverse impact of seasonal factors rather than that of trade liberalisation through market.

At the aggregate level, the indicators such as proportion of NR to TP, TC/TP and NR/GVO seem to be exhibiting an unfavourable picture in case of soybean. However, the other variables clearly indicate profitability position of soybean. The indicators convey positive sign and show increase over the survey period. Taluka Umred thus dominantly affects the aggregate profitability figures

The data on the processing units, though limited, revealed some interesting points. Though the units were experiencing high input (soybean seed) costs and fluctuating /falling output (oil) prices, the output and the income from sale was seen to be growing at a fast rate. This is possibly an indicator of growing demand for soybean.

On the whole the falling prices of edible oil and the adverse impact of the same seems to be compensated by growing derived demand for soybean. The exercise with the primary data indicates that the prices of soybean are maintained / increasing as the supply falls short of the increasing demand.

Thus, the available data does not clearly show any adverse impact of trade liberalisation on soybean cultivation in Maharashtra. As is mentioned earlier in chapter three, the second phase of trade liberalisation is characterised by increasing tariffs on edible oil with the duty on edible oil reaching its limit (the bound rate of 45 percent) as per WTO regulations. Hence, given the comparatively higher rates of tariffs, any change in the price of imported edible oil would depend upon domestic and external factors.

CHAPTER V

SUMMARY AND CONCLUSIONS

Trade liberalisation assumes importance for the edible oil sector in India due to the complete reversal of the policy governing trade of the same. Till 1994, imports of oilseeds and edible oil were canalised through State Trading Corporation and were distributed through the public distribution system. Import restrictions and various programmes for increasing area and production under traditional and non-traditional oilseeds during late 1980s made India nearly self sufficient though at the cost of high oil prices for the consumers of edible oils. However, with the initiation of India's own programme of economic liberalisation and the Uruguay Round Agreement, major policy decision relating to edible oils was taken. These were put under open general license and the duty was lowered from 65 percent to 15 percent over a period of four years- from 1994 to 1998. Consequently, imports increased to the benefit of the consumers. In the mid 1990s, imports reached their lowest level and thereafter started increasing again. On the whole, with opening up of trade, the imports of edible oils have started increasing. The share of imports, which was around 4 percent in early 1990s, has gone up to around 30 percent of the total available oil, as in the late nineties.

As an impact of liberalisation (and removal of protection) on oilseed growers and oil processors, the ceiling put on the domestic prices (because of the imported oil) can have dampening effect on prices of oilseeds and margins of processors. This might make the oilseed crop unremunerative and may manifest in falling area under the crop if the existing cropping pattern is no more profitable. Fear has been expressed that increasing dependence on imports/international markets for edible oil might be risky if the prices fluctuate violently. Therefore, assessment of impact, if any, of trade liberalisation on the edible oil sector becomes necessary.

Among the total oilseed crops, thirty year old non-conventional soybean crop expanded in terms of area and production at quite a fast rate in absolute as well as relative terms after mid 1980s and came to occupy an important place in the cropping pattern at all India level. In 1998-99, 23.6 percent of the total area under oilseeds was under soybean and 28 percent of the total production of oilseeds, was contributed by

soybean. The important position of soybean in the cropping pattern consequently gets reflected in the production of soybean oil, which increased by more than 2000 percent during 1981-82 to 1997-98. Moreover, soybean oil is a major input to the vanaspati industry. Next, soybean is one of the important contributors to the gross national product through the exports of soybean cake/ meal, which accounts for more than 50 percent of the quantity and value of total exports of oil cake/meal and is increasing over the period at a very fast rate. It is quite clear that increasing flow of resources had been being directed towards this sector. Rising importance of the produce also hints at its profitability and gains to the producers.

Need for the Study

In the light of potential for increasing consumption /usage of soybean and its products occupy in the consumption basket, it is necessary to analyse whether the process of trade liberalisation and tariff reduction has had any impact upon the current status of soybean sector in India. Specifically to note is its effect on small farmers in soybean cultivation who are unorganised (as against the processing units and exporters) and depend largely on vagaries of nature for the production. A declining demand for soybean would affect the demand and employment of labour. Maharashtra is the state, second in the rank after Madhya Pradesh as far as area under and production of soybean is concerned. It would be interesting to study the impact of trade liberalisation on soybean economy of the state.

Objectives of the Study

The major objectives of the study are as follows-

1. To assess the changes in the cropping pattern and
2. To assess the impact on farmers' income due to decrease in production and prices of oilseeds.

These objectives envisage firstly, the analysis of changes in area, production and yield of soybean in the post reform period as compared to the pre-reform period at the state level; secondly, the analysis of impact of reduced tariffs and cheap imports of edible oils on soybean prices in the domestic market and thirdly, understanding the

impact of trade liberalisation on the cropping pattern, income, profitability and employment in the case of soybean cultivators in the villages of Maharashtra.

Methodology of the Study and the Limitations

The study utilises secondary as well as primary data. In the former case, major focus was on analysing the changes firstly in area, production and yield of soybean in the pre and post reform period and secondly in the prices of edible oil – domestic and imported during the liberalisation period. An attempt has been made to relate the latter to the former to understand, if the existing cropping pattern was changing. In the case of primary data, again, the trends in area, production, productivity and labour use in case of soybean and the competing crops were noted. This was related to the relative profitability of the crops cultivated by the sample households. For this exercise, for each crop of the household, various indicators of profitability were calculated and the extent and the direction of change in the same over the survey period were noted. Lastly, the perceptions of the respondent households on the likely impact of trade liberalisation were recorded. For understanding the current position and opinions of the soybean processing units regarding trade liberalisation, their responses were also analysed.

For analysing the impact of trade liberalisation at the micro-level, as per the guidelines of the coordinating centre, districts with soybean as the major crop had to be selected. On the basis of absolute area under soybean and share of area under soybean to gross cropped area, district Nagpur was selected. Using the same criteria two talukas -Umred and Narkhed were selected. Within each taluka, three villages were chosen

Twenty sample households were selected randomly in each village stratified by the size of landholding, thus making the total number of households 60 for each taluka. The survey was conducted during January and February 2000 and the data was collected for three years from 1998-99 to 2000-01.

Soybean Cultivation in Maharashtra

The growing importance of oilseed cultivation in Maharashtra's agriculture is clear from the increasing trend in area under oilseeds which was 145400 ha in 1960-61 and 267400 ha in 1998-99, thus registering an increase of 1755 percent. The

production has grown nearly three times registering an increase of 363 percent over a period of forty years

Shorter duration, easy cultivation and harvesting, benefits in terms of improvement in fertility prompted farmers to undertake soybean cultivation primarily in the north east region of the state where the climatic conditions were also suitable for soybean cultivation. The shorter duration of the crop allows the cultivators to take the second crop on the same piece of land and add to their income/profits, which is not possible for kharif crop like cotton.

A comparison of area and production of soybean in Maharashtra and Madhya Pradesh shows that Maharashtra lags behind as far as the absolute values are concerned. However, the striking point to be noted is declining trend in area and production in Madhya Pradesh, as against that of Maharashtra. The percentage of area under and production of soybean in Maharashtra to that of Madhya Pradesh is rising over the period.

Changing Tariff Structure and the Performance of Soybeans in Maharashtra

According to the economic theory, prices through their effect on relative profitability play important role in farmers' decisions relating to allocation of land. With changes in relative prices, of inputs and output, farmers would respond by adjusting cropping pattern to maximise their benefit. Cheaper imports due to lower tariffs can affect the domestic prices adversely if the price of imported good including the tax rate and other costs are less than the domestic prices, thus setting a ceiling for the to the latter to rise. The level at which domestic prices get settled would also depend upon the external factors like weather conditions and demand for the crop especially at the international level. Hence it is expected that increasing imports of cheap edible oil (that competes with the domestic oil) in the country would reduce relative price and profitability of soybean cultivation through the impact on demand for soybeans. At the state level, the impact can be observed by relating the cropping pattern changes to the relative prices.

An attempt was made to understand the impact of reduced tariff rates on the soybean prices of Maharashtra and in turn its effect on the area under soybean. The effective (i.e. after tax) price of imported edible oil was compared with the price of

soybean prevailing in Maharashtra in the post liberalisation period. It was observed that the latter was lower than the former in the earlier phase of tariff reduction. However, with increasing imports of edible oil, tariff rates increased. Domestic oil prices were found to be higher than the former in this latter phase of tariff hikes. It was also noted that the prices of soybean remained stable as compared to that of oil in the post reform period especially in the late nineties. Similarly, the area under and production of soybean during this particular period did not show any declining trend. Even with the assumption that prices as one of the explanatory factors affecting area under cultivation with a lag, (i.e. here, a few years after the steps for liberalisation and tariff reduction were taken in 1994-95), such a trend is not observed in case of Maharashtra. This indicates relative profitability of soybean cultivation in the post liberalisation period too. The secondary data shows that at the macro level, i.e. at the state level, area and production have been rising continuously in Maharashtra and hence apparently, cheaper imports of edible oils do not seem to have affected the same. There is a possibility that the rise in the area and production (though at a slower pace) of soybean without being affected by prices is due to a few factors. Firstly, the rate of increase in the area and production in case of Maharashtra is higher than that in Madhya Pradesh where in fact the data shows a marginal decline in both in the recent years. Secondly, in absolute terms, the area and production in Maharashtra are around only one fourth that of Madhya Pradesh; the oil/cake producing capacity is also less in Maharashtra. Thus, this means that Madhya Pradesh contributes bulk of the supply of soybean and Maharashtra contributes only a small percentage to total soybean supplied. It might be the case that with increasing demand for oil (as the NCAER estimates show), increasing import duties in the recent past years and marginally declining area and production in Madhya Pradesh is compensated by increasing area and production in Maharashtra.

Profitability of Soybean Cultivation in the Changing Scenario: Analysis of the Survey Results

The major points that emerged from the analysis were as follows-

- The two selected talukas were heterogeneous regions in terms of broad features of the agricultural sector. The three-year data collected presented two different

pictures of economics of soybean cultivation in the two talukas. Constant/increasing area under soybean and its increasing profitability in Umred was attributed to good monsoon in this region vis-à-vis other regions. Soybean cultivation was clearly seen to be profitable due to its shorter duration and lesser costs in terms of irrigation, application of fertilisers, insecticides/pesticides, supervision etc. Majority of the respondents expressed the opinion that soybean prices were rising in recent years and that the area under the crop would be maintained. Narkhed presents a different picture. Though majority of the households maintained that soybean prices were rising, they were concerned about the crop failures and declining trend in production in recent years. Thus, the households were not able to recover the costs from the income received from soybean cultivation. The net return was seen to be negative for many households. At the aggregate level, variables clearly indicate profitability position of soybean. The indicators convey positive sign and show increase over the survey period. Taluka Umred thus dominantly affects the aggregate profitability figures. The likely impact of trade liberalisation is expected to be captured in terms of declining trend in edible oil prices and adverse effect on soybean cultivation. However, the indicators reveal adverse impact of seasonal factors rather than of trade liberalisation through market. Prices of imported edible oil (through their impact on demand for soybeans) did not seem to have affected prices of soybeans and its relative profitability in both the talukas.

- The data on the processing units, though limited, revealed some interesting points. Though the units were experiencing high input (seed) costs and fluctuating /falling output (oil) prices, the output and the income from sale was seen to be growing at a fast rate.

On the whole, the falling prices of edible oil and the adverse impact of the same seems to be compensated by growing derived demand for soybean. The exercise with the primary data indicates that the prices of soybean are maintained / increasing as the supply falls short of the increasing demand. Profitability of soybean is seen to be increasing in taluka Umred wherein even large farmers are changing their cropping pattern in favour of soybean. Narkhed presents exactly opposite situation.

Though soybean prices are rising, farmers- especially the larger farmers are changing their cropping pattern in favour of the competing crops by reducing area and share of area under soybean. Thus, it is not the prices, but the natural factors that govern production that have reduced the relative profitability of soybean cultivation as is clear from various profitability indicators. The aggregate figures however exhibit profitability of soybean cultivation as in the case of Umred Profitability figures for this taluka seem to be dominating the aggregate figures.

At all India level, impact of liberalisation of trade in edible oil is revealed through increasing imports of edible oil and falling prices of domestic edible oil. However, the initial phase of tariff reduction is over and the tariff rates have been increasing again. This second phase of trade liberalisation is characterised by increasing tariffs on edible oil with the duty on edible oil reaching its limit (the bound rate of 45 percent) as per WTO regulations. For Maharashtra, the available data does not clearly show any adverse impact of trade liberalisation as well as tariff reduction on soybean cultivation in Maharashtra. Given the comparatively higher rates of tariffs, any change in the price of imported edible oil would depend upon domestic and external factors.

However, it can be said that over a period of time, depending upon various external demand and supply factors, Maharashtra might experience a decline in area in future, if import duties on soy oil / palm oil are reduced further, given the other things. In such a case, incomes of the cultivators and agricultural labourers might be badly hit.

Policy Implications

It is observed that the profitability of soybean cultivation in the sample talukas depends on the market signals of demand and supply which are also governed by the seasonal factors. With the tariff rates on imported edible oils already increasing in the second phase of reforms, there may not be further scope for rise in the same. In these circumstances, for Maharashtra, increasing production of soybean remains the major issue. This can be achieved by –

- Increasing yield of soybean through better technology of production. This assumes importance as expansion in area under soybean may not be feasible at the macro

level. Ensuring adequate and good quality soybean would help the processing units in utilising excess capacity and compete with the imported oil.

- Provision of irrigation facilities so that the farmers do not have to depend on the vagaries of nature.
- Provision of marketing support so that the farmers avail of better prices for their produce.

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APPENDICES

Appendix 1.1

Edible Oils and the Trade Policy Changes

1.Trade Policy Changes in Edible Oils		
A. Tariff related measures		
Date	Policy Decision	Import (%)
May 14,1994	Edible oils placed under restricted list	65
May 15,1994	Palmoline placed under OGL	65
March 31, 1995	Edible oils except Coconut oil, Red Palmoline stearine placed under OGL	65
April 1,1995	Import duty reduced	30
1996-97,budget	Import duty reduced	25
July 9,1998	Import duty reduced on edible oils except Coconut oil,3 varieties of Palmoline	15
Dec.30,1999	Import duty hiked on refined edible oils	27.5
Nov.21,1999	Import duty hiked on refined oils -	
	Soybean	45
	RBD Palmoline and Palmoil	65
	Groundnut/Sunflower	45
Nov.21,1999	Import duty hiked on crude edible oils	
	Soybean	35
	Palm oil for Vanaspati	55
2000-01 budget	Import duty hiked on refined oils except Soybean-	85
	Import duty hiked on crude edible oils	75
B. Other Measures:		
In 1995, Soybean import allowed on temporary basis subject to meal re-export by private processors. Exports of Sunflower and Rapeseed-Mustard allowed.		
In 1997,storage restrictions were removed.		
In 1998, import of oilseeds put under OGL.		
In 1999, working capital restrictions on trade and processing of oilseeds and oil under Selective Credit Control were lifted in 1996.Investment ceiling for small scale industries increased to Rs.30 million. Future trading in major oils allowed.		
2.GATT Tariff Ceiling Bindings		
Commodities	Tariff Bound (%)	
Soybean & Rapeseed-Mustard Oils	45	
Groundnut and Sunflower Oils	300	
Other Vegetable oils	300	
Oilseeds	45	

Source: For trade policy changes-Damodaram and Hegde(2000), other-Singh and Asokan(1999)

Appendix 4.1

Area, Share of Area, Production, Yield and Labour Use Pattern in Case of the Competing Crops of the Sample Households in the Two Talukas

Variable	Land Size Classes							
	I		II		III		IV	
	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Area (In ha)								
Umred								
Paddy	-	-	0.28	0.00	0.28	0.00	0.68	-33.33
Chilly	-	-	0.12	0.00	0.66	-10.51	1.48	-6.00
Cotton	-	-	-	-	0.20	-100.00	0.39	-33.33
Tur	0.04	-52.63	0.10	0.00	0.07	-16.67	0.18	-25.00
Narkhed								
G.nut	-	-	0.40	0.00	0.74	0.00	0.87	0.00
Cotton	0.22	0.00	0.57	12.22	1.24	42.91	2.50	30.67
Jowar	0.27	0.00	0.63	13.33	1.11	25.00	2.44	0.95
Tur	0.10	0.00	0.30	0.00	0.38	0.00	0.51	11.11
Mug	-	-	0.20	0.00	0.40	0.00	0.50	0.00
Udid	-	-	0.20	0.00	0.20	0.00	0.33	0.00
Share of Crops in Total Cultivated Area (In percentage)								
Umred								
Paddy	-	-	41.18	0.00	9.11	0.00	13.50	-33.33
Chilly	-	-	17.27	0.00	18.19	-7.69	13.20	-28.22
Cotton	-	-	-	-	5.00	100.00	2.39	33.34
Tur	23.77	-51.21	33.33	0.00	8.04	-16.67	2.19	-25.00
Narkhed								
G. Nut	-	-	3.64	0.00	17.72	0.00	5.15	0.00
Cotton	26.80	0.00	25.40	12.22	19.14	4.02	24.77	27.71
Jowar	15.13	0.00	30.30	13.33	24.57	-0.92	25.99	-0.27
Tur	11.43	0.00	2.18	0.00	5.35	0.01	4.62	8.89
Mug	-	-	1.82	0.00	2.00	0.00	1.28	0.00
Udid	-	-	2.00	0.00	1.00	0.00	1.38	0.00
Total Produce (In Qtl)								
Umred								
Paddy	-	-	25.00	13.64	15.00	15.38	42.00	-44.74
Chilly	-	-	11.00	37.50	13.00	11.99	29.86	-0.47
Cotton	-	-	-	-	4.00	-100.00	15.13	-39.58
Tur	2.00	-33.33	5.00	11.11	2.00	10.71	4.00	-18.75
Narkhed								
G. nut	-	-	7.00	0.00	8.63	3.21	7.00	0.00
Cotton	2.29	-2.50	5.79	19.75	12.62	45.31	27.05	26.29
Jowar	2.78	0.00	6.31	19.02	14.53	24.29	25.07	3.38
Tur	0.60	5.26	2.13	6.25	3.00	7.22	3.42	42.97
Mug	-	-	2.00	0.00	1.50	-25.00	2.40	-10.00
Udid	-	-	-	0.50	0.00	0.50	0.00	1.38

Variable	Land Size Classes							
	I		II		III		IV	
	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Yield (In Qtl / ha)								
Umred								
Paddy	-	-	17.86	13.64	15.00	15.38	21.00	-44.74
Chilly	-	-	22.29	10.83	12.94	6.93	16.16	9.17
Cotton	-	-			4.00	-100.00	9.51	-32.81
Tur	11.11	40.74	10.00	11.11	6.67	29.76	5.83	-2.08
Narkhed								
G. Nut	-	-	17.50	0.00	13.02	3.21	8.33	0.00
Cotton	10.63	-2.50	10.38	-1.84	10.08	18.14	11.40	4.34
Jowar	10.67	0.00	10.59	7.71	13.73	4.29	10.64	2.47
Tur	6.00	5.26	7.50	6.25	7.92	7.22	6.76	20.75
Mug	-	-	10.00	0.00	3.75	-25.00	4.50	-10.00
Udid	-	-	2.50	0.00	2.50	0.00	4.17	-12.50
Hired Labour Use per Hectare (In mandays)								
Umred								
Chilly	-	-	110.83	9.37	50.46	-0.81	50.56	-12.67
Paddy	-	-	23.57	0.00	17.25	-10.00	8.50	-9.38
Cotton	-	-	-	-	-	-	30.07	26.31
Tur	-	-	14.00	0.00	14.44	42.42	15.83	1.44
Narkhed								
G. nut	-	-	107.50	0.00	85.42	4.33	87.22	0.00
Cotton	177.64	3.62	109.17	-14.25	99.16	6.57	106.37	8.85
Jowar	80.04	0.00	68.17	0.37	57.85	0.86	48.29	-3.39
Tur	60.00	0.00	66.25	0.00	78.33	5.19	65.61	1.81
Mug	-	-	100.00	0.00	60.00	0.00	21.88	0.00
Udid	-	-	50.00	0.00	60.00	0.00	30.83	0.00
Family Labour Use per Hectare (In mandays)								
Umred								
Chilly	-	-	122.92	-35.27	37.99	4.99	26.80	95.35
Paddy	-	-	22.86	-	47.00	4.83	11.21	-9.38
Cotton	77.78	28.50	50.00	0.00	45.56	66.13	42.08	61.67
Tur	-	-	-	-	45.00	-	22.47	6.25
Narkhed								
G. nut	-	-	100.00	0.00	26.98	0.00	46.67	0.00
Cotton	109.44	-1.67	73.23	-15.97	26.63	2.13	27.65	1.15
Jowar	107.14	0.00	58.72	-2.71	24.10	0.36	24.44	3.75
Tur	50.00	0.00	70.00	0.00	23.54	0.00	44.92	-3.70
Mug	-	-	100.00	0.00	20.00	0.00	87.50	0.00
Udid	-	-	65.00	0.00	20.00	0.00	54.17	0.00

Note: % change is calculated over the period from 1998-99 to 2000-01

Appendix 4.2

Various Indicators of Profitability of Cultivation of the Competing Crops of the Sample Households in the Two Talukas

Variable	Land Size Classes							
	I		II		III		IV	
	Average	% Change	Average	% Change	Average	% Change	Average	% Change
NR per hec (In Rs / hec)								
Umred								
Paddy	-	-	629.29	28.05	-1496.00	70.96	1905.36	-9.12
Chilly	-	-	9975.00	29.69	15646.82	-22.01	15771.85	15.98
Cotton	-	-	-	-	1175.00	-100.00	2228.82	-54.14
Tur	2055.56	99.77	2358.80	12.97	-123.33	34.97	40.00	-8.91
Narkhed								
G.nut	-	-	14450.00	13.78	9479.38	15.11	1361.11	-49.31
Cotton	9357.36	6.38	11642.65	18.77	12908.04	61.99	15412.24	39.57
Jowar	-2534.13	4.47	-294.11	-5.45	2049.71	45.11	-2.87	5.79
Tur	1725.00	49.96	3968.75	209.84	32334.17	999.03	1486.03	-169.04
Mug	-	-	4920.00	13.10	1192.50	-50.10	430.00	-35.89
Udid	-	-	1075.00	0.00	725.00	-25.64	610.83	-67.86
Ratio of Net Return to Total Produce								
Umred								
Paddy	-	-	176.20	12.69	-182.00	75.26	490.48	-45.90
Chilly	-	-	1645.54	-5.19	1301.56	-22.70	1373.93	4.24
Cotton	-	-	-	-	2100.00	-100.00	820.61	-56.66
Tur	925.00	41.94	1179.40	1.67	-6.67	9.41	240.00	-29.96
Narkhed								
G. Nut	-	-	825.71	13.78	690.93	9.95	98.89	-49.31
Cotton	873.39	8.34	1028.39	12.17	1271.74	34.42	1290.34	30.34
Jowar	-245.19	4.47	-68.22	-19.66	124.27	44.88	-13.69	7.89
Tur	287.50	42.46	501.29	161.75	3717.08	851.06	213.63	-179.15
Mug	-	-	492.00	13.10	318.00	-33.47	96.00	-32.36
Udid	-	-	430.00	0.00	290.00	-25.64	125.11	-64.48
Ratio of Total Cost of Cultivation to Total Produce								
Umred								
Paddy	-	-	323.80	10.27	182.00	75.26	176.19	0.53
Chilly	-	-	329.46	3.89	827.62	7.21	497.68	5.45
Cotton	-	-	-	-	631.25	0.00	1254.23	15.73
Tur	275.00	10.74	420.60	7.85	473.33	52.75	360.00	-3.80
Narkhed								
G. Nut	-	-	374.29	0.00	396.57	7.18	1101.11	1.64
Cotton	1084.94	13.17	949.95	-11.16	656.60	12.60	750.00	11.15
Jowar	645.19	7.88	461.55	2.31	279.07	9.78	421.27	0.01
Tur	912.50	2.01	598.71	-16.96	646.53	0.56	894.15	-9.75
Mug	-	-	365.00	-	482.00	49.69	704.00	31.31
Udid	-	-	770.00	-	710.00	16.39	858.22	39.37

Variable	Land Size Classes							
	I		II		III		IV	
	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Share of Net Return in Gross Value of Output (In percentage)								
Umred								
Paddy	-	-	0.35	1.42	-	-	0.74	-48.99
Chilly	-	-	0.00	0.00	0.23	-33.33	0.26	-40.23
Cotton	-	-	-	-	0.70	-100.00	0.39	-60.35
Tur	0.77	6.46	0.74	-1.50	0.72	-18.34	0.57	-49.43
Narkhed								
G. Nut	-	-	0.69	4.30	0.64	1.66	0.08	-57.75
Cotton	0.45	-0.26	0.52	-1.21	0.66	15.65	0.65	13.12
Jowar	-0.61	-4.30	-0.17	-27.45	0.30	36.25	-0.03	4.02
Tur	0.24	29.46	0.46	142.16	0.60	125.44	0.19	-168.07
Mug	-	-	0.57	5.58	0.40	-33.47	0.12	-32.36
Udid	-	-	0.36	0.00	0.29	-25.64	0.11	-69.46
Gross Value of Output per family member (In Rs)								
Umred								
Paddy	-	-	2593.06	31.69	4437.25	28.10	6596.91	4.11
Chilly	-	-	4166.67	26.26	-	-	7000.00	-41.39
Cotton	-	-	-	-	840.00	-100.00	5270.38	-33.24
Tur	480.00	-11.11	4000.00	14.70	1050.00	-35.71	1000.00	-31.82
Narkhed								
G. Nut	-	-	1400.00	9.09	1591.39	11.38	1114.29	20.00
Cotton	867.46	5.81	2002.52	35.45	4972.52	66.70	7865.35	44.32
Jowar	215.61	11.48	511.63	34.96	1136.37	38.48	1451.48	10.37
Tur	111.43	15.16	388.93	12.50	3681.46	404.49	550.58	49.45
Mug	-	-	285.67	7.13	200.00	-25.00	158.63	-10.00
Udid	-	-	120.00	0.00	83.33	0.00	132.07	-0.54
Gross Value of Output per month (In Rs)								
Umred								
Chilly	-	-	3637.50	31.69	4754.97	28.10	7577.00	4.11
Paddy	-	-	2083.33	26.26	-	-	4666.67	-41.39
Cotton	-	-	-	-	1400.00	-100.00	5259.17	-33.24
Tur	400.00	-11.11	1333.33	14.70	700.00	-35.71	1000.00	-31.82
Narkhed								
G. Nut	-	-	1400.00	9.09	1556.25	11.38	1400.00	20.00
Cotton	745.14	5.81	1912.87	35.45	4075.00	66.70	9016.67	44.32
Jowar	185.19	11.48	412.78	34.96	967.78	38.48	1671.11	10.37
Tur	120.00	15.16	389.58	12.50	2506.81	404.49	628.06	49.45
Mug	-	-	285.67	7.13	200.00	-25.00	320.00	-10.00
Udid	-	-	100.00	0.00	83.33	-50.00	221.53	15.60

Variable	Land Size Classes							
	I		II		III		IV	
	Average	%Change	Average	%Change	Average	%Change	Average	%Change
Net Return per Family Member (In Rs)								
Umred								
Chilly	-	-	2131.04	29.69	3454.75	-8.97	4241.58	8.91
Paddy	-	-	1468.33	28.05	-385.00	70.96	2340.63	-9.12
Cotton	-	-	-	-	840.00	-260.00	3079.52	-54.14
Tur	370.00	-5.37	2948.50	12.97	159.58	-1.49	233.33	-8.91
Narkhed								
G. Nut	-	-	963.33	13.78	992.01	15.11	89.05	-49.31
Cotton	400.26	6.38	1195.49	52.45	3353.02	87.60	5256.42	65.46
Jowar	-118.67	4.47	-43.12	-1.95	439.99	73.56	0.20	7.17
Tur	26.49	49.96	176.64	209.84	3202.04	999.03	103.96	-173.10
Mug	-	-	164.00	13.10	79.50	-50.10	18.60	-35.89
Udid	-	-	43.00	0.00	24.17	-25.64	15.52	-67.86
Net Return per Month (In Rs)								
Umred								
Chilly	-	-	2998.96	29.69	3761.88	-8.97	4851.24	8.91
Paddy	-	-	734.17	28.05	-385.83	70.96	1404.17	-9.12
Cotton	-	-	-	-	1400.00	-340.00	2685.64	-54.14
Tur	308.33	-5.37	982.83	12.97	91.11	-1.49	225.00	-8.91
Narkhed								
G. Nut	-	-	192.67	13.78	710.57	15.11	33.83	-49.31
Cotton	244.68	6.38	947.16	52.45	1850.20	87.60	5581.20	65.46
Jowar	-45.22	4.47	-36.34	-1.95	286.79	73.56	-15.93	7.17
Tur	11.50	49.96	33.42	209.84	489.73	999.03	111.12	-173.10
Mug	-	-	32.80	13.10	15.90	-50.10	7.47	-35.89
Udid	-	-	7.17	0.00	4.83	-25.64	12.12	-67.86
Share of GVO of the Crop in Total GVO (In Percentage)								
Umred								
Chilly	-	-	35.63	0.04	32.2	-12.41	22.87	-27.54
Paddy	-	-	27.47	19.74	-	-	17.64	-61.26
Cotton	-	-	-	-	17.9	-100	13.46	-46.43
Tur	14.95	-55.14	39.70	-26.15	9.5	-50.12	7.42	-55.82
Narkhed								
G. Nut	-	-	34.98	-7.33	36.12	-1.07	7.57	-11.16
Cotton	60.48	-6.65	55.66	2.16	44.26	-1.94	53.03	11.00
Jowar	18.95	-1.95	16.54	12.20	15.14	-4.09	10.72	-14.00
Tur	25.80	-6.82	8.42	-14.69	21.59	155.61	4.03	34.41
Mug	-	-	7.14	-9.00	6.98	-3.63	2.91	-36.29
Udid	-	-	2.62	-6.56	2.91	28.49	1.76	-25.12

Variable	Land Size Classes							
	I		II		III		IV	
	Average	% Change	Average	% Change	Average	% Change	Average	% Change
Share of NR of the Crop in Total NR (In Percentage)								
Umred								
Chilly	-	-	37.46	2.05	34.55	-24.91	21.43	-22.69
Paddy	-	-	22.01	51.28	-2.57	20.45	8.86	-38.52
Cotton	-	-	-	-	22.28	-163.02	11.81	-68.72
Tur	14.39	-55.96	56.83	-33.05	2.67	-33.99	2.74	-40.37
Narkhed								
G. Nut	-	-	63.57	-44.56	42.52	-8.12	0.03	-85.06
Cotton	324.46	-148.69	115.81	-24.14	52.52	4.42	76.73	-8.36
Jowar	-133.89	-98.12	-31.47	21.93	9.17	21.28	-0.83	-31.65
Tur	20.02	-3.63	10.21	-158.35	22.93	324.82	1.85	-146.11
Mug	-	-	10.82	-44.89	6.48	-10.57	0.72	-71.77
Udid	-	-	1.88	-32.24	1.97	33.28	0.33	-89.09

Note: % change is calculated over the period from 1998-99 to 2000-01

Annexure I

Comments on the Draft Report by the Designated AERC unit, Delhi.

Title of the Study Report: Likely Impact of Liberalised Imports and Low Tariff on Edible Oil Sector in India: A Quick Survey of Soybean In Maharashtra

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The report is the outcome of a quick survey conducted as a part of all India study being carried out by several AERCs on behalf of the Ministry of Agriculture, Government of India. Initially 5 AERCs : Delhi, Vallabh Vidyanagar, Jabalpur, Waltair and Chennai were supposed to study Rapeseed and Mustered, Soybean, Palmoline and Coconut. The AERC Pune has studied Soybean in Maharashtra, along with the AERC, Jabalpur that carried out the Soybean study in M.P. The quick study was to facilitate the Ministry by providing grass root information for the negotiations with the W.T.O.

The report is divided in 5 Chapters. The First chapter presents an overview of trade liberalisation and edible oil sector in India. Chapter 2 covers growth of soybean sector in Maharashtra. Chapter 3 analyses impact of changing tariff structure on the performance of soybean in the state. Fourth chapter presents the survey results, covering the profitability of soybean cultivation in the state. Finally, chapter 5 is a summary and conclusions of the whole exercise.

Chapter wise comments are as follows:

Chapter I

This chapter, as stated above, presents an overview of trade liberalisation and edible oil sector in India. It has been divided into 9 sections starting with introduction of the problem, presenting in brief the trade policy changes, a profile of edible oil sector in the country, a brief review of literature on the subject etc.

The chapter is well organised as a prelude to emphasize the need of the study. In the last paragraphs, the objectives, methodology, design of the study etc. are presented in a comprehensive manner.

This chapter brings out some interesting points which have wider implications, e.g., due to opening up of trade, share of imported edible oil going up from 4% in early nineties to around 30% in late nineties (P3), labourers engaged in soybean cultivation getting wages than those engaged in other crops in the State(P9).

It needs no change in form or content.

Chapter II

This chapter is devoted to growth of soybean in the state. It has been divided into 3 sections, viz. broad outline of oil seed cultivation in the state, regional spread of soybean cultivation and lastly a comparison with the neighbouring state of Madhya Pradesh. It also brings out some important points, e.g. Vidharbha a backward region of the state is the main contributor of oil seed production. This fact has larger implication on regional disparity in case oil seed cultivation is rendered unprofitable due to cheaper import of edible oil, soybean oil particularly.

Chapter III

An attempt has been made to analyse impact of tariff structure on the soybean performance. This is also a brief chapter divided into 4 sections.

However, some statements made in this chapter are based either on big assumptions or purely on economic theory, which can work only in ideal conditions rarely seen in the real world. For example, the very first statement of the chapter ignores the basic fact that farming, unlike manufacturing or servicing, depends largely on soil mass, irrigation, weather etc. and therefore farmer's decisions are not always price responsive in real world, particularly when they do not have options of factors' mobility or have limited crop/output choice.

"It is seen period too," (P21).

The slight increase in area (absolute) under soybean has been confused with the decline in growth rate/trend in area. The very fact that rate of growth in area, production and yield has drastically come down in the post liberalisation period (Table 3.5) remains unexplained. If that is not the result of tariff reduction thereby dampening effect

on domestic prices, as the study asserts, then what makes the growth rate to fall drastically. Moreover, there is no access to data on prices and imports of soybean oil after 97-98. Whereas imports of edible oils (mainly palmoline and soybean oil) have gone up tremendously after 97-98 (almost 1/3rd of requirement is met through imports). Price relatives of imported oil worked out rightly are lower than domestically produced oil, then merely on basis of capacity of processing industry, the claim of the study that prices would be increasing and profitability maintained needs reconsideration (p21 last paragraph).

Lastly the concluding remarks also need to be reviewed. For example, the area analysis has been concluded on the basis of table 2.4 (where data upto 98-99 are available and there also area under soybean in Madhya Pradesh is declining. But focus of the study was to find out changes in edible oil sector during the last two-three years, i.e, after the liberlisation of edible oil took place and duties were drastically reduced. (The import duty was the lower, (as proposed to the TWO) 45% , on soybean in comparison to as high as 300% on some other oils. In practice even it was lower than the binding rate of 45% in 99-2000).

Implication of this will be that relatively small increase in absolute area under soybean in Maharashtra may not be sufficient to compensate big loss in area in Madhya Pradesh. Even with the passage of time in Maharashtra also (as indicated by falling growth rate) absolute area under soybean may decline. That will have direct bearing on regional disparity, farmers' and agricultural labourers' income. This aspect may be considered while concluding the chapter.

Chapter IV

Analysis of sample data has been presented in this chapter which has been divided into 7 sections covering all the important aspects of the study.

The emphasis that there is no adverse effect of trade liberalisation on soybean cultivation in Maharashtra (very first sentence) needs to be qualified on the grounds -first, the data are available upto 98-99, second, growth rate of area has drastically fallen, and finally there is drastic fall in area under soybean in Madhya Pradesh too, the immediately neighbouring states.

The factual inaccuracy, (second sentence para 4.2) needs to be corrected , area under oilseeds is more than that under food grains (table 4.1) not less.

In tables 4.3 and 4.4 year of cropping pattern etc needs to be mentioned.

Very important point "soybean to be the major and only crop for marginal farmers" P27, and "area under soybean being more than total irrigated area" P26,(table 4.3, 4.4), need to be focussed as these have wider implications from the point of view of number of irrigations required for oilseeds viz-a-viz other competing crops and from the point of view of social cost accounting of irrigation, more particularly in semi-arid areas where water scarcity is acute.

Table 4.6 (a) needs to be recasted to highlight the changes in area, production and yield of soybean as per the tabulation format used by all the centres. Also the analysis does not present full picture, neither in aggregate of the entire sample households, nor size-classwise. For example, in one taluka area under soybean in large size farms has gone up by 10% in other taluka it has come down by 13% and the net effect in absence of base is not known. Similar is the case of marginal farmers (4.3) and table 4.6 (a). Similarly, the changing cropping pattern differently in two talukas needs to be analysed in aggregate to focus the trend (4.3, P31).

In the profitability analyses of soybean cultivation less average prices received by the farmers in 99-00 when import duties were far less than in 00-01 when the duties were increased, have not been discussed. May be the increased duty structure affected the average prices received by the farmers in 00-01. Again the aggregate picture is not given. In one taluka, the soybean is very profitable whereas in other it is loosing its popularity, even higher prices do not seem to compensate the loss (p33).

The above points may be considered if deemed worth before finalising the report.

Annexure II

Actions Taken

Chapter I - No action required

Chapter II - No action required

Chapter III

1. A few things need to be clarified as far as the comments of the reviewer are concerned. Firstly, it has been amply proved and can not be denied that the farmers are price responsive and prices play important role in the decision making of the farmers as far as allocation of resources for various crops are concerned. Here, the word prices includes 'output' and 'input' prices too. Secondly, generally, a researcher would begin the work by studying what the economic theory / hypothesis has to say about the concerned subject matter. Hence, here the author begins with what the economic theory has to say about decision making by the farmers in ideal set of conditions. Further, The significant role of prices is the important underlying assumption in a discussion relating open economy framework, trade liberalisation and globalisation. It has been clearly mentioned at various places in the draft report that when we study the impact of trade liberalisation (i.e. the transactions at the international level) on the agents at the micro level, the implicit assumption is that the farmers respond to the prices, markets are related and that price transmissions take place (see e.g. P14, para. 2, Chapter 2). If it is otherwise, theoretically there is no possibility of any positive or negative impact on the decision making of the farmers. Thirdly, after studying what the economic theory says, a researcher would generally observe and analyse the empirical facts. The author is well aware of the fact that the assumptions of the theory may not hold in practice. A careful reading of the initial chapters of the draft report clearly reveals that the role of other factors or of the non-price factors (as has been mentioned by the reviewer) has been recognised (P 5. Chapter I). Role of climatic conditions, irrigation, marketing facilities etc., has been recognised in the report at various places especially in Chapter IV that deals with the primary data.

2. The data shows that area under Soybean has been increasing continuously till 1999-2000. However, the extent of percentage increase (and not the compound growth rate) is less in the post reform period than in the pre-reform period. The two phenomena can co-exist. E.g. Area (in 000ha) under Soybean in the post-reform period was 2012 in 1990, 5605 in 1994-95, 10556 in 1998-1999 and 11636 (as obtained recently) in 1999-2000. The reviewer has made a statement that 'the growth rate in area, production and yield has drastically come down which is not correct. It is only the percentage increase (i.e. the rate at which area is increasing) in the post reform period that has come down as compared to the pre-reform period. The above mentioned data shows that during 1994-1995 to 1999-2000, the area has increased by 88 percent. The percentage change in the initial pre reform period is seen to be very high (543.51%, Table 3.) as the baseline figure of the year 1987-88 is very low (770). Changes have been made in the first paragraph of section 3.2.2 (P 20-21) to clarify the point.
3. The claim that the profitability would be maintained is based merely on the assumption (as the relevant price data is not available) that prices would increase due to the increasing derived demand for Soybean from the processing industry.
4. A brief note on possibility of falling area under Soybean in Maharashtra is included as per the suggestions.

Chapter IV

1. The factual inaccuracy is corrected.
2. Years of the cropping pattern, etc. are mentioned in Tables 4.3 and 4.4.
3. Tables 4.6a and 4.7a amended to include the aggregate figures.
4. It is felt here that what needs to be explained is the sudden jump in the average price received by the household over the earlier (normal) years (which did not exhibit much variation across size classes/villages and over the years. Inclusion of aggregate price may not give us a very different picture, as the variations are not very large.

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