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A framework for identification of opportunities for agribusiness and agripreneurship in India

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Abstract

Agriculture and agribusiness are the engine of growth in India. The present study initially discusses the suitability of Policy Analysis Matrix (PAM) approach to identify the comparative and competitive advantage of an agribusiness for investigating its long term sustainability from both financial as well as economic perspective for promoting agripreneurship in the country. To test the suitability of the approach in real life, actual data was collected from three highly diversified sugar mills located in Maharashtra and Uttar Pradesh. The data was used to explore the financial and economic viability of not only the main activities of the firms i.e., sugar producing, but also the downstream business activities of these firms like distillery, paper manufacturing and chemical production. The study confirms the importance of the suggested approach in identifying the opportunities lying in the main and secondary downstream processing activities of the firm. The test of sustainability of the main and downstream processing activities at the firm level from financial and economic perspectives would help in suggesting the agripreneurs whether they should undertake the selected business activities or not. The study finally suggests performing sensitivity analysis to judge the robustness of the result within a reasonable range of important parameters, which may have large impacts on the result.

Keywords: Agribusiness, Agripreneurship, DRCR, Policy Analysis Matrix, Sensitivity Analysis

Introduction

Agriculture is the backbone of the Indian economy. The performance of Indian economy depends a lot on the performance of agriculture and its allied sector. Even though the percentage contribution of agriculture to the GDP of the country has come down over the years falling from 55.1% in 1950-51 to 37.6% in 1981-82 and to about 16% at present. However, in absolute terms, its contribution has continuously increased over the years and still the largest economic sector in the country.

Agriculture provides raw materials to various industries of national importance like sugar industry, jute industry, cotton textile industry, edible oil industry etc. If we also include the contributions from various agribusinesses, the percentage contribution of agriculture and its allied sector including various agribusinesses would be even much higher. In export earnings also the contribution of agriculture and agribusiness products is outstanding. India ranks second worldwide in the farm output, and is one of the largest producers of crops like food grains, sugarcane, fruits, vegetables, spices, tea, cotton, jute etc. Agriculture and allied sectors like forestry, logging and fishing provides employment to about 52.1% of the total workforce in the country. Indian states Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Andhra Pradesh, Bihar, West Bengal, Gujarat and Maharashtra are the key agricultural contributing states of India.

Agriculture all over the world is passing through a phase of transition. With the signing of Agreement on Agriculture (AoA) under WTO, there is increased emphasis on trade without discrimination, freer trade

through negotiation, predictability through binding and transparency. These all have contributed to scope for free and fair competition. Agriculture is taking new shape and expansion in its scope. Now its scope is not merely limited food and fibers. People are looking at agriculture as the provider of clean fuel as well in view of limited availability of petroleum and coal energy sources. All these developments have created new opportunities and scopes for agriculture and agribusinesses. Even though, more than half of the workforce is employed in the agriculture and its allied sector, many of them are suffering from hidden unemployment.

On this front the agripreneurship can be promoted as proactive employment strategy in the country for economic self-sufficiency of rural people. Researchers have highlighted the fact that agripreneurship can be helpful in national economy in multiple ways: a) inducing productivity gains by farmers and integrating them into local, national and international markets, b) helping in reduction of food costs, supply uncertainties and improving the diets of both rural and urban poor and c) generating growth, increasing and diversifying income, and providing entrepreneurial opportunities in both rural and urban areas (Bairwa et. al., 2014). Therefore, agripreneurship development is the key for promoting micro, small and medium enterprises. Capacity development for agripreneurship can be helpful in improved performance of an individual resulting in employment generation, poverty reduction and human resource development.

The identification of opportunities is the biggest problem that an agri-entrepreneur faces. The resources

are always limited and the selection of the right field for developing a business and investment therein at the right point of time is the key to success. Looking from project management perspective, the agri-preneur also faces the triple constraints on the basis of scope, time and budget before undertaking a particular project and he/she has to make tradeoffs before choosing a particular option. Depending on the resources and time available, the agripreneur can also increase or decrease the scope of a business for its long term sustainability. It is very important what all activities the firm should undertake at its own and for what items, it should depend on outside firms. However, this question is not so easy to answer. After generating various possible business options the agripreneur has to investigate the sustainability of the business not only from private perspective but also from social and economic perspectives.

Looking at the importance and huge scope of agriculture and agribusiness, the role of agripreneur is immense in the country. It is necessary to depend on a suitable framework to decide what business or what downstream activities of a particular business one should undertake, which may be viable from financial as well as economic perspective. The current article makes an attempt to fill this gap and presents an approach to investigate the scope and viability for developing agribusiness and to promote agripreneurship in India.

Approaches and Methodology

To identify the agribusiness and agripreneurship opportunities, we have to continuously search for new avenues. It is not enough to look always for altogether a new business. Sometimes, the new business opportunities can be derived from the existing business as well. In the present paper, sugar value system has been explored as an example to identify the scope of new businesses within agricultural and allied sector. There are about 500 different sugar mills in the country. However, most of them only produce sugar as their final products. However, by inclusion of some of the downstream activities, the overall competitiveness of the sugar sector could improve. This area has not gained much importance in the country. The present study

explores the scope of downstream units using Domestic Resource Cost Ratio (DRCR) approach.

DRCR estimates the cost of domestic primary resources (i.e., non-tradables) in order to earn or save each unit of foreign exchange through production and exchange (through export or import) of the product. DRCR is essentially a cost-benefit ratio where the cost is measured in terms of primary resources valued at true economic prices and benefits in terms of value addition to tradables valued at true economic prices. Essentially, the primary factors are responsible for the value addition in the product and theoretically all the tradable inputs can be procured at the international price (assumed to be economic price after adjustment of other costs involved in transportation, insurance, handling etc.). That is why only the net cost of primary factors is taken in numerator side of DRCR instead of total cost of production as in general cost-benefit analysis.

There have been several studies using the DRCR methodology on the competitiveness of different industries especially in agricultural sectors of developing countries that are subject to large-scale government regulations and control. The competitiveness analysis using the DRCR methodology helps in identifying the social profitability and competitiveness of industries and finds out the impact of various government policies on the competitiveness of the industry under consideration. Among some of the notable works, Fox and Dahlgram (1990) applied this methodology in US dairy industry to identify the desirability of some of the US government policies related to the industry. Barzelay and Pearson (1982) studied the efficiency of producing alcohol from sugarcane for energy in Brazil and discovered that production of alcohol from sugarcane in Brazil is not an economically efficient activity. It costs rather than saves the foreign exchange for that country. Ingram and Pearson (1981) studied the impact of specific investment concessions on the profitability of selected firms in Ghana while Byerlee (1985) analysed the effect of policy intervention on price incentives and resource use in wheat and dairying in Ecuador from 1970 to 1983 using the same methodology.

The theoretical framework used for the DRCR based competitiveness analysis of the sugar industry has been given in Table 1.

Table 1: Theoretical Framework for Policy Analysis Matrix

Item	Value of Outputs		Value of Inputs	
	Tradable	Non-tradable	Tradable	Non-tradable
1. Domestic Prices	A	B	C	D
2. Economic Prices:				
a) Border Prices	E	-	G	-
b) Opportunity Costs	-	F	-	H
3. Policy Transfer	A-E	B-F	G-C	H-D

Here, Domestic Resource Cost Ratio (DRCR) = $(H - F) / (E - G)$

Domestic resource cost ratio is the ratio of net cost of primary factors to the value-added to tradables. It indicates the efficiency with which each production unit uses domestic resources to generate or save foreign exchange. In notational terms,

$$\text{DRCR} = (\text{Sum}(W_p * F_p)) / (P_c * T_c - \text{Sum}(P_i * T_i))$$

where,

W_p = social prices (opportunity costs) of primary factors

F_p = primary factors of production

P_c = social prices (world price equivalents) of per unit output

T_c = quantity produced of output

P_i = social price (world price equivalents) of tradable inputs

T_i = quantity used of tradable production inputs.

In literature, this is also referred as Policy Analysis Matrix (PAM).

From the Table 1, it can be seen that,

$$\text{Net Private Profit (NPP)} = (A + B) - (C + D),$$

$$\text{Net Social Profit (NSP)} = (E + F) - (G + H),$$

$$\text{Total Policy Transfer (T)} = \text{NPP} - \text{NSP}$$

From these formulae, it can be derived that

$$\text{NSP} = (E - G) * (1 - \text{DRCR})$$

The above formula implies that if the value of DRCR is between 0 and 1, NSP from the industry becomes positive. In this case, value of domestic resources used in production is less than value of foreign exchange earned or saved; hence the industry has the competitive advantage. When DRCR is more than 1, the industry becomes non-competitive as the value of domestic resources used in production becomes greater than the value of foreign exchange earned or saved and the net social profit turns out to be negative. The major steps involved in the present study through PAM have been shown in Fig. 1.

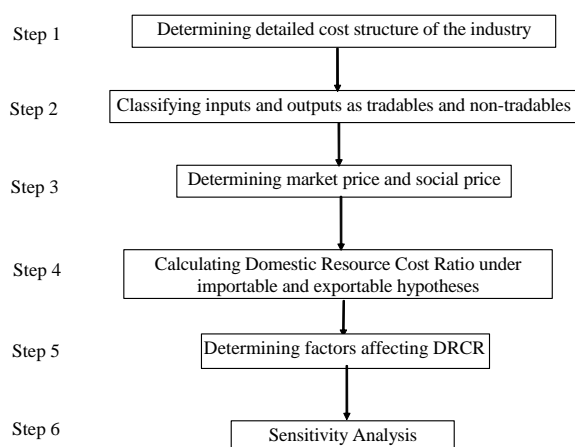


Fig. 1: Major Steps Involved in the Study

Data Collection and Sampling Plan: For the present study, competitiveness analysis for the sugar industry is performed at three sugar producing firms. Out of these three firms, two are from Maharashtra (Mill 2 and Mill 3) and one from Uttar Pradesh (Mill 1). The sample firms are selected in such a way as to cover some of the downstream processing activities.

Results and Analysis

Mill 2 has paper and distillery units utilizing bagasse and molasses for production of paper and alcohol respectively. Mill 3 has a distillery-cum-chemical unit where it produces alcohol that is internally used for the production of chemicals. Mill 1 has distillery units that use molasses for the production of alcohol. The increase or decrease in overall competitiveness of the sugar-manufacturing firm due to a downstream unit depends on competitive position of the downstream unit. If the downstream unit is less competitive than the sugar unit, it is very likely that the overall competitiveness of the sugar-manufacturing firm will decrease. On the other hand, if a downstream unit is more competitive than the parent sugar unit, it is likely that the overall competitiveness of the sugar-manufacturing firm will increase with the downstream unit.

For better understanding of competitiveness of downstream units and their impact on overall competitiveness of sugar manufacturing firms, DRCR values are for downstream units under both the exportable hypothesis (i.e. competing with foreign products in international market) and importable hypotheses (i.e., competing with foreign products in domestic market) are presented in Table 2. The DRCR values for the distillery unit at Mill 1 are 0.364 and 0.576 under importable and exportable hypotheses indicating its competitiveness at both the domestic and international market. However, distillery unit at Mill 2 is only import competitive (DRCR value 0.620) but it is not export competitive (DRCR value 1.174). Paper unit at Mill 2 and chemical unit at Mill 3 are quite competitive under both the importable and exportable hypotheses as the DRCR values are below unity under both the cases.

Table 2: Domestic Resource Cost Ratios of Sugar Mills at Sugar Manufacturing and Other Downstream Units

Units	Mill 1		Mill 2		Mill 3	
	Importable	Exportable	Importable	Exportable	Importable	Exportable
Sugar	0.661	0.960	0.546	0.754	0.723	1.024
Distillery	0.364	0.576	0.620	1.174	-	-
Paper	-	-	0.483	0.594		
Chemical	-	-	-	-	0.585	0.803
Sugar and distillery	0.655	0.953	0.547	0.757	-	-
Sugar and paper	-	-	0.530	0.710	-	-
Sugar and chemical	-	-	-	-	0.684	0.960
Sugar, distillery and paper	-	-	0.531	0.712	-	-

Source: Gupta (1999)

The impact assessment of downstream units on overall competitiveness of sugar manufacturing firms has also been done by integrating the results for downstream units with the results for their parent sugar units in Table 2. This is the weighted average of the results for the parent sugar unit and the downstream units. Since DRCR value for the distillery unit at Mill 1 is less than that for its parent sugar unit, DRCR value for the integrated complex comes down from 0.661 to 0.655 under importable hypothesis and from 0.960 to 0.953 under exportable hypothesis. The DRCR value for chemical unit at Mill 3 is also less than the sugar unit under both the hypotheses and so the overall competitiveness of the integrated complex increases compared to only sugar unit. The DRCR value in this case comes down from 0.723 to 0.684 under importable hypothesis and from 1.024 to 0.803 under exportable hypothesis.

The DRCR value for distillery at Mill 2 is more than DRCR value for sugar unit under both the importable and exportable hypotheses. Therefore, the combination of distillery and sugar units at Mill 2 is slightly less competitive than sugar unit alone with DRCR value for the combination going up from 0.546 to 0.547 under importable hypothesis and from 0.754 to 0.757 under exportable hypothesis. The DRCR value for paper unit at Mill 2 is, however, less than DRCR value for sugar unit under both the importable and exportable hypotheses and so the combination of sugar and paper is more competitive than the sugar unit alone. The value of DRCR for the combination of paper and sugar units at Mill 2 comes down from 0.546 and 0.754 (for sugar unit alone) to 0.530 and 0.710 under importable and exportable hypotheses respectively. The combination of sugar, distillery and paper units as a whole at Mill 2 is also more competitive than sugar unit alone. The DRCR value for the combination of these three units at Mill 2 is 0.531 under importable hypothesis and 0.712 under exportable hypotheses.

Conclusion

Based on the above analysis it can be concluded that the combination of downstream units with their parent firms increases the competitiveness in almost all cases (except for the distillery unit at Mill 2). Even if the distillery unit at Mill 2 is not competitive in international market (under exportable hypothesis), it is still competitive in domestic market with respect to imported products.

DRCR value for a downstream unit is based on assumption that it is located in the same premise as its parent sugar unit and operating under the same management. It purchases its main raw materials (i.e., molasses or bagasse) from its parent sugar unit for further processing. By operating the downstream units within the same premises under the same management a sugar mill saves many types of transaction costs and also on transportation cost involved in getting raw materials. Therefore, DRCR values for the downstream units might be a little higher if these downstream units operate as separate entity altogether. But, by operating downstream units as part of large sugarcane agro-industrial complex, sugar mills tend to reduce the cost at downstream units and increase the competitiveness at downstream unit level which ultimately gets reflected in increasing overall competitiveness of the aggregated sugar manufacturing complex.

Suggestions

This present study highlights the following implications and suggestions for the agribusiness firms and government.

- Rather than always looking only one sector, it is the need of the time to look for more business options in terms of by-products units or some other downstream units. This provides more leverage to the agribusiness firms in terms of competitiveness.
- Even if the unit is not competitive in international market, its competitiveness should be tested in domestic market against the imported products. The high cost of transportation of agricultural products as they are high volume and low value products,

provides natural cushion to the agribusiness to compete in the domestic sector against the imported products.

- Government should also encourage the establishment of downstream by-product units. It can do so by moving the parameters under control of the government and firms in a favourable direction (e.g., by partly relaxing the repressive regulations, if any) for improving the overall competitiveness of the firms.

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