THE ROLE OF PRICE SUBSIDIES IN AGRICULTURE IN PAPUA NEW GUINEA

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ABSTRACT

In PNG ,subsidies in the agriculture sector are related to major export tree crops such as coffee, cocoa, copra and oil palm and are aimed at helping the local producers. The role, function and welfare implications of price subsidies of the agriculture sector in PNG are addressed in the paper. The focus has been on subsidy schemes that are concerned with producer protection. In that respect deficiency payments, direct production subsidies, specific export subsidies and interest rate subsidies are discussed in detail. The recently established Agriculture Price Guarantee Scheme (APGS) is analysed.

***Key words**: Subsidies, local producers, functions/roles, implications.*

INTRODUCTION

In most countries in the world (both developed and developing alike), subsidies are instituted to help both producers and consumers. In Papua New Guinea (PNG) subsidies are and have been part of the successive government's Fiscal Policy regime for decades. They have been applied on factors of production (inputs) and outputs for various sectors and come in a variety of forms.

Subsidies are direct opposite of taxes. While taxes raise revenue to boost the government treasury, subsidies are a cost to the government and society as a whole. In a developing country context, most often taxpayers bear the burden of subsidy schemes. While they may benefit (both directly and indirectly), in some cases they do not benefit. The incidence of the subsidy burden on taxpayers and the potential benefits will depend on the elasticity of supply and demand and the nature of the markets (both domestic and international).

In the Agriculture sector in PNG, subsidy payments are on factors of production and on output of major export tree crops such as coffee, cocoa, copra and oil palm. In recent times the apparent failure of the Price Stabilisation Schemes for coffee, cocoa, copra and oil palm in stabilizing producer prices and incomes has led to the establishment (in 1993) of the Agriculture Price Guarantee Scheme (APGS). Most subsidy schemes in the agriculture sector are aimed at helping the PNG producers. Consumer-based subsidy schemes are rare, if not almost non-existent in the agriculture sector in PNG.

The objective of this paper is to look at the role of price subsidy schemes in the Agriculture sector in PNG. In that respect the mechanics and operation of the different types of subsidies will be looked at. The welfare implication of such subsidy schemes will be analysed. The recently installed APGS will be analysed in detail. As much as possible, simplicity of analysis and avoidance of theory and abstract will be maintained throughout the paper. This is cognizant of the fact that since this is a consultative and "brainstorming" seminar, a clear, consistent and simple message needs to be relayed to the Department of Agriculture and Livestock (DAL) to help refine its policies and strategies.

MARKET INTERVENTION

Subsidies, in essence, are interventionist in nature. They may also be reactionary. They are established by governments because of the apparent failure of the market mechanism to efficiently allocate resources and determine the 'optimal' level of prices and outputs.

The intervention in the free working of the market mechanism goes against the principles of neoclassical economics which advocates free interac-

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tion of supply and demand to determine optimal price and output levels. However, action by the government to institute subsidy schemes with the hope of correcting *market failure* may actually lead to *market distortion*. Moreover, there may be mismanagement of subsidies, misallocation of resources and loss in both producer and consumer surpluses.

In a competitive market environment the demand curve represents willingness of individuals to pay for additional units of goods and services. Likewise, the supply curve represents the willingness of producers to produce additional units of goods and services. The demand curve therefore can be defined as the marginal social benefit curve while the supply curve can be defined as the marginal social cost curve. However, the market mechanism only incorporates goods and services which are exchanged in the market, and hence acquire a monetary value. These costs and benefits are termed private costs and benefits. There are, however, costs and benefits associated with the production of goods and services which are not valued through the market process. For example, costs and benefits associated with the environment and natural resources. Market failure reflects the inability of the market mechanism to incorporate these unpriced costs and benefits into the assessment of Net Social Benefit (the summation of consumer and producer surpluses). The existence of externalities and inadequate definition of property rights also contribute to market failure.

Because market failure implies distorted and suboptimal price and output levels, government intervention by way of subsidy schemes may lead to further distortion in price and output levels. The magnitude of such distortions will depend on the elasticity of supply and demand.

This aspect of subsidy schemes in the agriculture sector in PNG is important given uncertainty over the supply responsiveness of PNG producers to such schemes and the uncertainty over the causal relationship between price and income stability. The very few studies done (eg. Gerritsen 1985) show that PNG copra producers may be unresponsive to price changes. If prices increase or are guaranteed at a higher level, production may not necessarily increase. The perennial nature of agricultural commodities may compound this problem.

Despite further distortions introduced by subsidy schemes and given the open nature of the PNG economy and the easy transmission of international price instability into the domestic economy for major agricultural exports, subsidy schemes guaranteeing producer prices and outputs at least offer some form of protection to PNG producers from external price fluctuations. The extent of the protection against fluctuating prices may be problematic because price stability may not automatically translate into income stability. See for example Houck (1973), and Nguyen (1979). Certainly, given the competitive nature of commodity markets, the transmission of the full guaranteed price levels along the domestic marketing chain to the producer levels may not be achieved. Manipulation by middlemen may put downward pressure on guaranteed prices and, hence, output. See for example, Gumoi (1993).

ROLE AND EFFECTS OF SUBSIDIES

The primary role of price subsidies is to act as a buffer against external disturbances by guaranteeing prices to producers at some level. The aim is to stabilise production and producer incomes. Subsidy schemes are usually undertaken in situations of prolonged depressed state of commodity prices. Sometimes, however, subsidy payments on inputs and output may be an essential element of the governments policy of import substitution and/or export promotion. They may also be effected through the Interest Rate Policy.

A subsidy payment made by the government forms a wedge between the price consumers pay and costs incurred by producers such that price is less than marginal cost. Such payments may have a number of possible objectives: (1) a transfer from taxpayers to producers or consumers of a particular commodity in order to raise producer incomes, (2) to influence the behaviour of suppliers or demanders via the mechanism of the elasticity of supply or demand, (3) to keep prices of certain commodities low or stable as part of an anti-inflation policy. Multi-product firms engaging in cross-subsidization may also use subsidies.

There are many types of subsidy schemes which are designed to protect both producers and consumers from the vagaries of market forces. They may be designed to either encourage exports or discourage imports. Some subsidy schemes are designed to directly affect producers (eg. quotas). In this paper, the direct subsidy schemes aimed at

protecting agricultural producers in PNG will be looked at in detail. Direct and indirect consumer subsidy schemes will be briefly mentioned.

The beneficial incidence of subsidies is important to determine the desirability or otherwise of subsidies. It is often observed that the benefits of subsidies may not necessarily be the direct recipients. For example, consumers of a subsidized commodity may benefit by way of lower prices and suppliers of factors of production such as fertilizers may also benefit.

However, subsidy schemes are often criticized on several fronts. Prices of subsidized factors of production are rarely reduced by the whole amount of subsidies. Subsidies on output and inputs used by farmers may be inequitable in the sense that larger producer incomes may be boosted at the expense of smaller producers. Even when subsidy schemes raise per unit returns on production, they may be ineffective welfare measures in improving the most depressed incomes. A dependency mentality may be created among farmers who may be content with 'free financial handouts'. This may be more so in cases where farmers may be risk averse. The transmission of false market signals may lead to resource misallocation. The desired results of a subsidy scheme may not be attained in terms of increased production without a full knowledge of the nature of supply responsiveness of PNG farmers.

Let us now look at some of the direct subsidy schemes that are aimed at protecting producers in the agriculture sector.

Deficiency Payments

Some form of agricultural price guarantees for many products are an integral part of agricultural price and income policies of many countries. Such price guarantee schemes guarantee producer prices that are in most cases higher than the prevailing market prices.

Various measures can be employed to protect internal price guarantees. The traditional trade policy mechanisms are tariffs and quotas. Although they may be considered indirect subsidy measures, they have operational drawbacks. Fixed or ad valorem tariffs involve transmission of world price fluctuations into the domestic economy. Input quotas may insulate the domestic economy from the vagaries of international market forces, but they may widen domestic price fluctuations caused by internal supply and demand fluctuations.

As part of a protective trade policy, variable levies may be employed to protect domestic price guarantees from being defeated by trade flows. Variable levies effectively disconnect domestic price of imports from world prices. Domestic demand and supply instability is transferred to the world market through the change in imports. As with fixed or ad valorem tariffs revenue is generated.

The price stability in internal markets introduced by variables levies may, however, lead to producer income instability as domestic agricultural production fluctuates from season to season. With the failure of the present price stabilisation schemes to siphon off price fluctuations, producer incomes in a large importing country like PNG may swing more widely than if producer prices were flexible and connected to the international markets. Despite this apparent drawback, price guarantees through a variable levy system tends to discourage imports in the short-term. Over time, this may induce domestic supply to increase faster than otherwise.

Protection afforded to producers by way of import tariffs, quotas and variable levies requires domestic consumers to pay higher prices for protected goods than otherwise. There is loss in consumer surplus which may be a gain by producers and the national government. However, consumer losses can be avoided by a production subsidy that involves deficiency payments.

The workings of a deficiency payment system and its desirability are elaborated on in section 4 where the Agricultural price Guarantee scheme introduced by the national government in the 1993 budget is discussed. In this section we will develop a simple analytical framework to assess the welfare effects of a deficiency payment system.

Figure 1 sets out a simple partial equilibrium analytical framework. *P1* is the international price in the absence of any protection (i.e, in a free trade situation) where quantity *ac* (figure 1b) would be imported. This is equivalent to *be* in figure 1a. If the government sets the guaranteed producer price at *Ps* and instead of intervening directly in the market to ensure that the producers get *Ps* it resorts to a deficiency payment scheme, how would this scheme operate?

The difference between *P1* and *Ps* is the deficiency payment in the form of direct payments to producers. Domestic output expands by *fg* units above free market production. The higher *Ps* relative to *P1*, the larger the deficiency payment. Buyers in the domestic market still face *P1*. Hence, no negative consumption occurs. If *Ps* and consumption will fall by *hj* units. But with deficiency payments consumption stays at *Oj*. But because domestic production expands by *fg* units, imports must decline by an equal amount.

In figure 1b deficiency payments alter the original demand curve. The new demand curve with a deficiency payment scheme is ED*. It measures the amount of imports demanded at various market prices when *Ps* is guaranteed. Note that the supply curve in given *Ob* is perfectly elastic while the demand curve is inelastic. This is because the PNG economyis small and open and therefore has no influence on world prices. It is essentially a price-taker.

Deficiency payments aimed at protecting producers do not affect consumers. But the taxpayers and the government have to bear the burden of such schemes because deficiency payments are a cost. They raise no additional revenue unlike tariffs and quotas.

Direct Production Subsidies

Deficiency payments and variable levies ensure producers a guaranteed price for their output. It can be argued that each of these schemes have an income goal. Direct production subsidies, however, are aimed at expanding domestic output, usually in a program of deliberate import substitution. Production subsidies can take two forms. First, it can be a specific per unit payment from the government to the producers. The second type is on inputs like fertilizer. The aim of these types of subsidy payments is to reduce direct production costs in the hope that domestic agricultural output will increase at the expanse of imports. A large portion of the domestic markets for commodities may be captured by the local industries but at a cost to the taxpayers and the government.

Figure 2 lays out the analytical framework for a direct production subsidy. The analysis is similar to those outlined for deficiency payments (Section 3.1). The only difference is that the subsidy in this case is a per-unit amount and not an output price guarantee.

The per unit subsidy is *S*. Producers supply curve shifts to S* because marginal costs fall. Demand curves shifts to ED* and imports fall from *ab* as domestic output increases and replaces imports. The per unit return to producers increase from *P1* to *P2*. This decline in imports has no direct effect on buyers of the subsidized products since the fall in imports is balanced by an increase in domestic production. Prices of buyers of the product do not change. In all, producers benefit and taxpayers meet the cost of the subsidy program. There are also opportunity costs involved as there is resource movement into the subsidized sector. As long as imports do not influence international prices, consumers are unaffected by the production subsidies.

Export Subsidies

Export subsidies are a direct-unit payment by the government to exporters on volume of goods cleared for export. Exporters may purchase products at a higher price in the domestic market and sell them for a lower price in the world market.

Export subsidies come in different forms. They may be fixed, ad valorem, open-ended or variable. For purposes of simplicity, a fixed or specific export subsidy is discussed here. Interested readers are referred to Houck (1986) for elaboration on the other types of export subsidies.

Figure 3 lays out the analytical framework of a specific export subsidy. The specific subsidy is *S* It shifts supply curve of exports to the right to ES* expanding export volume by *ab*. International price remains at *PI* but domestic prices increase as exporters expand exports to earn subsidy payments, thereby increasing prices paid for export goods. This increase in domestic market price curtails domestic consumption but expands production.

As a caution, it should be noted that when an exporting country raises domestic market prices of exports above the world market level, it must curtail imports of that product and its close substitutes so that there is no inflow of imports into the domestic economy.

Subsidized Interest Rates

Sometimes governments can assist agricultural producers by providing the means to purchase factors of production. Subsidized interest rates

may provide 'cheap' credit to producers through the banking system. However, the experience in PNG with the Rural Development Bank and the commercial banks is that the 'cheap' credit becomes expensive for the poor farmers and benefits the already wealthy.

If one takes into account the administrative cost of loan disbursement, cost of funds and the risk premiums, then subsidized interest rates may in fact be higher.

THE AGRICULTURAL PRICE GUARANTEE SCHEME

Introduction

PNG's major agricultural export commodities are Coffee, Cocoa, Copra and Oil Palm. These crops together account for about 30 percent of total export earnings and about 70 percent of export earnings from agricultural production. However, the supply of these commodities is highly elastic while the demand is inelastic in nature. This implies that PNG is just a price-taker and not a price-maker.

Since 1985 the world prices for these commodities have declined by about 60 percent in real terms. World Bank price forecasts (table 3) show very little improvement in the future. Hence, the future of these export industries looks bleak, although in recent times prices for cocoa and copra have been on the improve.

Given the relatively small and open nature of the PNG economy, the degree of susceptibility of the economy to the vagaries of international market forces is great. The transmission of external price fluctuations will therefore have an impact on the domestic economy.

The apparent failure of the present commodity price stabilisation schemes in stabilising producer prices and incomes as a result of prolonged depressed state of commodity prices prompted the government to institute the Agricultural Price Guarantee Scheme (APGS) as part of its 1993 budget reform. Although the economics and rationale of the scheme are not immediately obvious, the presumed objective of the scheme is to support producer prices at some specified level (see table 1). The APGS scheme was deemed necessary because the survival of the four major export industries were dependent upon government price support.

Table 1: **Govt. Guaranteed Prices under the APGS (K/tonne)**

Cocoa	1 300 (dis)
Coffee	2 300 (fob)
Copra	250 (depot)
Oil Palm	26 (ffb)

Source: Dept. of Finance and Planning

Mechanics and Operation of the APGS

Apart from the APGS being interventionist and reactionary in nature, it is a system of Deficiency Payments. The intention of such a payments system (together with variable import levies) is to protect domestic producer price guarantees from being undermined by fluctuations in producer prices and incomes as a result of the vagaries of international market forces.

The Deficiency Payments System works in the following manner. Basically a price is guaranteed by the government to the producers. If the world price falls below the guaranteed price, a deficiency payment is paid to the producers. The amount of the deficiency payment will be equivalent to the difference between the guaranteed and world prices.

The present Commodity Price Stabilisation mechanism is used to effect the APGS in terms of making bounty payments. The bounty payment is actually the deficiency payment. The respective commodity boards (with the exception of Oil Palm) have to make formal submissions to the government (Department of Finance and Planning) on likely production and corresponding prices before funds are released to support producer prices.

Cost of the Scheme

The cost of the price support package under the APGS was estimated by the government to cost about K84 million in 1993 (Budget Paper 1993, Vol.1). Table 2 gives the amount disbursed as of September 1993 and the estimated cost by the end of that year. Between Janauary and September 1993 the amount disbursed for the 4 major export tree crops amounted to about K85 million. By the end of the year producer price support to the major

export tree crops amounted to K104 million. For 1994, the government has estimated the APGS to cost about K71 million.

Table 2: **Level of Expenditure under the APGS (Jan-Sept 1993)**

Export Crop	Total Support (K million)	Total Estimated 1993 (K million)
Cocoa	19.0	22.6
Coffee	56.0	72.5
Copra	9.1	12.1
Oil Palm	1.2	1.5

Source: Dept. of Finance and Planning

The cost of the APGS should be critically analysed in terms of opportunity costs. In particular, it should be viewed in comparison to the Commodity Price Stabilisation Schemes. The major difference between the APGS and Commodity Price Stabilisation Schemes is that the latter is partly financed by grower contributions in the form of levies while the former is being totally financed by the government through its price support programme. Hence, the level of opportunity costs in terms of alternative productive investment of funds elsewhere will generally be high in the former than the latter.

In the short term (1993-1996) the level of price support (and opportunity costs) is likely to increase considerably, especially in the Oil Palm and Copra industries where there is rivalry and close substitutes available in the world market. This is because price projections by the World Bank either show very little improvement or fall well below the domestic guaranteed price levels (see table 3). The long term price forecasts (2000-2005) show an improvement in prices but should not be trusted because they are in any case very speculative. Whether world commodity prices improve will be determined by interaction of the world supply and demand conditions. PNG has no influence on world supply and demand conditions.

Merits of the Scheme

The APGS has been complemented by the removal of export duties on exports of Coffee, Cocoa, Copra and Oil Palm as part of the 1993 budget reform process. There is some economic justification for the institution of the APGS. The conventional trade policy mechanisms to protect internal price guarantees such as tariffs, variable levies and quotas have operational problems. Such mechanisms require that domestic consumers pay prices for protected goods that are higher than otherwise. Loss in consumer surplus is usually the consequence, although such a loss may be a gain to producers in terms of increased revenue.

However, the system of deficiency payments (which also is a form of production subsidy) aimed at protecting producers can also protect consumers. The deficiency payment system involves direct payments by taxpayers rather than transfers from consumers. Such an incidence of burden on taxpayers rather than on consumers occurs because consumers still purchase both imports and domestic output at competitive market prices. Because price guarantees in the form of deficiency payments is by way of direct payments, no conventional trade policy mechanisms such as tariffs, variable levies, and quotas (which can be considered as indirect price guarantee measures) are required. Hence there is no direct restriction of trade.

Table 3: **World Bank Commodity Price Projections**

	Short Term		Long Term	
	1993	1996	2000	2005
Coffee (c/kg)	137	130	298	231
Cocoa (c/kg)	104	112	170	215
Palm Oil ($/MT)	410	430	460	413
Copra ($/MT)	290	210	313	492

Note: Appropriate conversions to Kina/tonne terms need to be made before interpreted against table 1. Conversions from c/kg to Kina/tonne would involve multiplication by 1000 and division by 100. Conversions from $/MT to Kina/tonne would involve multiplication by 100 and division by 1000.

Source: World Bank, May 7 1993

Demerits of the Scheme

The institution of the APGS has serious implications for the future operations of the present commodity price stabilisation schemes are not self-financing, unbalancing and unpredictable over time, the AGPS could be an ideal alternative producer income stabilisation mechanism. However, as already argued the opportunity costs of the APGS are likely to be high. Moverover, the APGS may have created a dependency mentality among

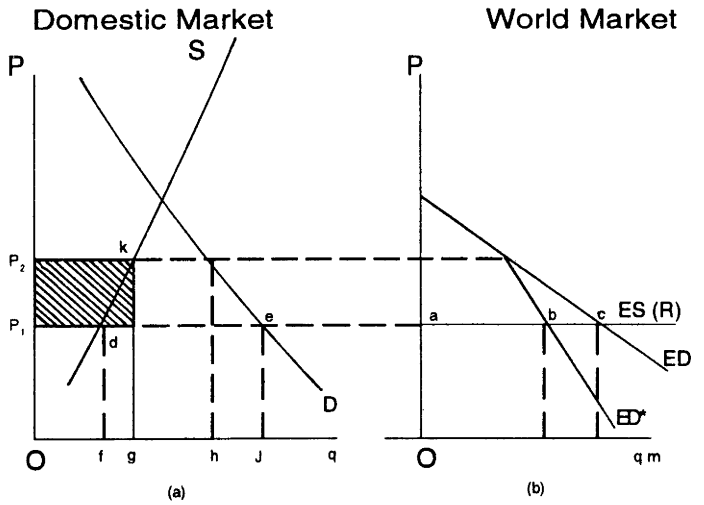

Figure 1. Deficiency payment and imports

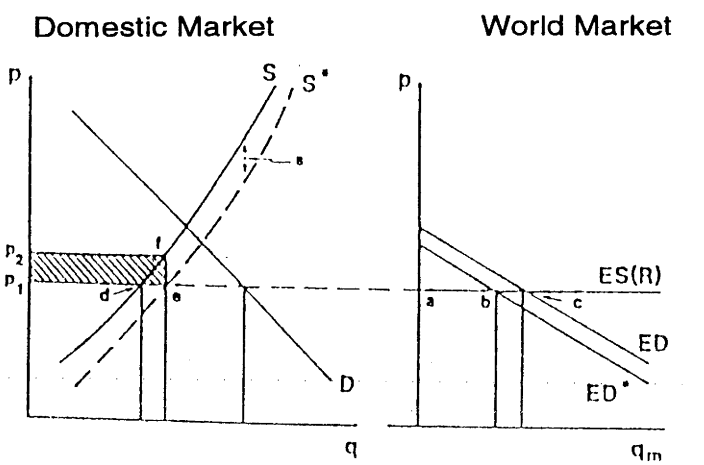

Figure 2. Direct Production Subsidy

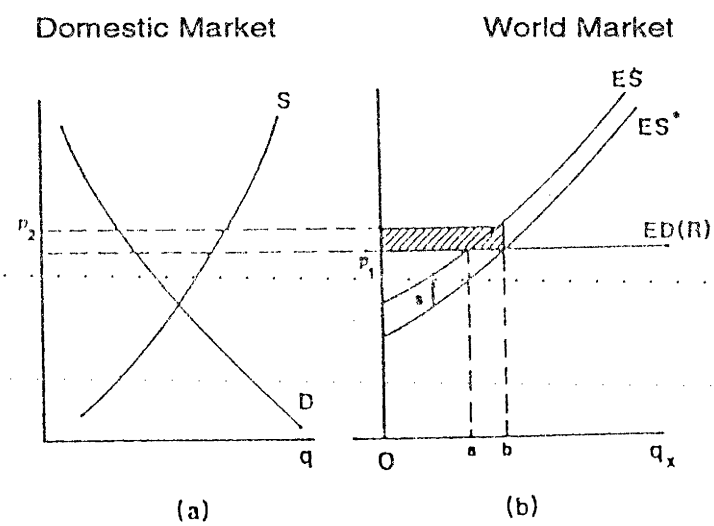

Figure 3. Fixed Export Subsidy

Source: HOUK (1986)

farmers. This may have negative implications for expansion of production in the industries.

Because of free exit and entry into the industries, the government price support may actually be an incentive mechanism to induce entry by other producers. Those already in the industries may also not leave because of 'free financial handouts'. Hence costs (including opportunity costs) of the price support programme may actually increase.

In summary the APGS is really a system of Deficiency Payments and should technically be referred to as such. Its relevance and desirability should be based on costs (especially opportunity costs) and benefits. If the present prolonged depressed state of commodity prices is any indication, costs of the APGS are likely to increase in the long-run.

In that respect, a decision needs to be made on the future of Commodity Price Stabilisation Schemes. If the Price Stabilisation Schemes are abandoned, the APGS should probably be effected through another mechanism other than the Price Stabilisation mechanism. This should rid the Commodity Boards of this additional responsibility so that scarce resources are employed to concentrate on the production, marketing and research/ extension aspects of their mandate.

CONCLUSION

Subsidies are interventionist in nature and a cost to taxpayers and the government. They come in different forms and their effects can be both direct and indirect. Usually governments institute subsidy schemes to protect both producers and consumers from the vagaries of international market forces. In the PNG agriculture sector, producer-based subsidy schemes are more prevalent.

Government intervention in the free working of the market mechanism with a view to correct market failure may lead to market distortion. Sub-optimal price and output levels may be achieved. Transmission of such distorted levels can further distort prices and output. Hence, subsidies may be self-defeating in the sense that the desired results of increased and/or stabilised price and output levels are not achieved.

This paper has attempted to address the role, functions and welfare implications of price subsidies in the agriculture in PNG. The focus has been on subsidy schemes that are concerned with producer protection. In that respect deficiency payments, direct production subsidies, specific export subsidies, and interest rate subsidies have been discussed in some detail. The recently established Agriculture Price Guarantee Scheme (a form of deficiency payment system) is also analysed in depth.

It is felt that the desirability or otherwise of subsidy schemes will hinge on the government policy direction. Such a direction, however, needs to take into account the costs (especially opportunity costs) and benefits of subsidies on a case by case basis. The precedence of producer protection over the opportunity costs of such protection implies considerable burden on society.

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