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Charging For Agricultural Extension Services

Phillip Hone*

The implications of recent trends in the delivery and financing of agricultural extension services are assessed. The economic consequences of the introduction of charges and the increased reliance on private consultants to deliver extension services are considered in terms of their efficiency and distributional consequences. It is concluded that there is a strong efficiency case for charging for most extension activities. The presence of externalities or non-rival consumption properties in some extension activities does not establish that subsidised provision would be justified from an efficiency perspective. The impact of the price elasticities of demand for extension services and rural output on the distributional consequences of alternative funding options is considered.

1. The Issue

The current pattern of provision of advisory services to Australian farmers is markedly different to that which was in place prior to 1980. Until relatively recently agricultural extension services provided by government bodies were generally funded directly from consolidated state revenue. No charges were levied on rural producers who used the services. However, over the last 10 years increasing emphasis has been placed on the use of direct charges to fund the various rural extension networks in Australia.

In the Government sector, advisers appear to be far more focused on dealing with groups of farmers rather than individual operators. Services provided to individual farmers are generally provided on a cost recovery or full commercial basis. Exceptions to this commonly include disease diagnostic services. There has also been a change in the emphasis of government extension services away from advice aimed directly at improving farm profits towards activities which have a wider societal impact. This includes the growth of Landcare groups focusing on soil conservation activities.

Private sector involvement in the delivery of exten-

sion services has also undergone substantial change. The private sector has increased its activities in areas which were previously dominated by public extension services. Anecdotal evidence is consistent with this expansion in activity coming from agribusiness firms, such as dairy factories, as well as an increase in the number of small private consultancies.

Finally, rural industries now have a greater degree of control over the direction of extension activities. This control exists by virtue of the increased reliance of research organisations on funding from industry controlled rural industry research funds as well as the increase in consumer sovereignty flowing from direct charges.

The changes have been even more pronounced in New Zealand. In that country nearly all extension services are provided on a commercial basis. The only exceptions to this are services that constitute assistance to deal with adverse climatic factors.

The aim in this paper is to critically assess the efficiency and distributional implications of these changes in the delivery and financing of extension services. For the purposes of this analysis extension services are defined to include all those activities involved in the translation of the available information on technical and management issues into a form that is relevant to, and available for, decision making at the farm level.

The previous research in this area is briefly outlined in the next section of this paper. The remainder of the paper addresses three issues:

* Department of Applied Economics, Deakin University, Melbourne. The author thanks, with the usual caveat, the anonymous referees for helpful comments.

Review coordinated by the Editor.

- the efficiency implications of charging for extension services or financing them from levies;
- selection of the mode of delivery of services; and
- the distributional consequences of alternative approaches to financing extension services.

2. Previous Studies

Although little research has focused specifically on the impact of charging for extension services the issue has been addressed in a number of papers in a general policy context. Harris *et al.* (1974) implied that there was limited scope to charge for extension services without adversely affecting society. They argued that the complex and diverse nature of extension services, coupled with major administrative difficulties, reduced the feasibility and desirability of the introduction of charges for services.

In contrast, Balderstone *et al.* (1982) suggested that the wide availability of free government services unjustifiably restricted the scope of activities for the private sector. While stopping short of advocating a complete change over to direct charges they did recommend that more services should be charged for than was the case in most states.

Bell (1984) was more forthright than his Australian counterparts in his review of the operations of the United Kingdom agricultural development and advisory service. He stated that in principle at least "it seems entirely appropriate that farmers, growers, consultants and whoever else in the industry avail themselves of these services should meet the cost of their provision" (Bell 1984).

The move towards the wider use of charges to fund extension activities was supported by McColl (1986) on the grounds that it represents a means of improving the efficiency with which extension activities are undertaken. He argued that government advisers should charge for many specific technical services.

McColl also went one step further to argue not only that government should not provide free advisory services of an intensive and continuing nature, but that the provision of these services should be the

domain of private consultants.

Lloyd (1986) also indicated that it would be desirable for the Victorian Department of Agriculture to expand the range of services for which it charges producers.

Thompson (1987 and 1985) reviewed some of the issues involved in introducing charges for extension services but did not consider the efficiency implications of a fee for service policy in an economic framework.

3. Introduction of Charges and Levies

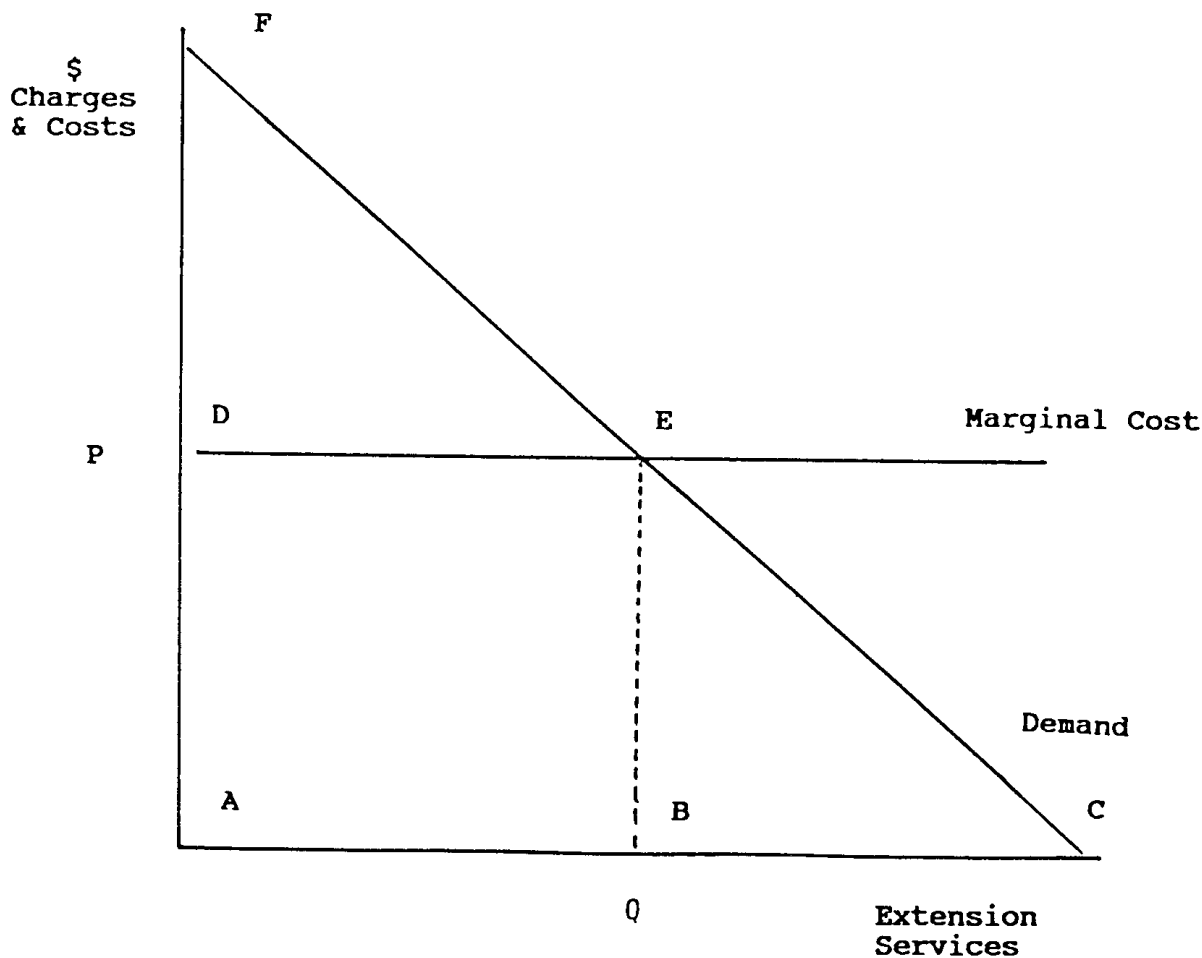
For the extension industry as a whole, the optimal supply of services in the simple constant marginal cost case, with rival consumption and no externalities, is illustrated in Figure 1. The demand for extension services is derived from the demand for technical and management information. The marginal cost curve reflects all the resource costs associated with the delivery of extension services (but not research costs). The optimal position for the industry is achieved when Q units of extension services are consumed by the farmers represented by the "F to E" segment of the demand curve. The resulting net social benefit will be equivalent to the area $D E F^1$.

These conditions would be achieved when a price of P is charged. It could also be achieved if the optimal quantity was administratively determined and allocative procedures were put in place to ensure that the services went to those consumers with the highest marginal valuations for the services.

Within this framework, addressing the efficiency implications of the implementation of the user pays principle involves focusing on the demand and supply characteristics of advisory services. More specifically, it is necessary to consider whether the imposition of charges is likely to produce a greater

¹ One of the referees has correctly pointed out that extension organisations may rationally choose to supply more than Q units if the extension activity results in wider benefits to the organisation, such as improved public relations. In terms of Figure 1, this implies that the marginal cost curve should be interpreted as a measure of the costs of providing services, less the value of any wider benefits which flow to the supplier.

Figure 1: Net Social Benefit and the Allocation of Services



departure from the optimum consumption of services than would be the case with free provision.

3.1 The Negative Effects of Charges

Clearly, charges will usually reduce use of charged-for services. The extent of these likely reductions depends on the price elasticity of demand for advisory services and the magnitude of the charges.

Where the extension services are essentially pri-

vate goods, with no substantial externalities, any consequent reduction in consumption which flows from the imposition of charges is likely to be desirable from an efficiency perspective. In this case, charges will ensure that the value placed on the services by consumers relates to the cost of providing extension.

However, where particular services have externality or non-rival consumption characteristics, charges have the potential to create efficiency costs. These

costs may take the form of under-consumption or over-consumption of services when compared with the societal optimum, depending on whether the services exhibit non-rivalry in consumption, positive externalities or negative externalities.

Resources involved in the gathering of information of a general nature for subsequent use by a number of clients or dissemination of information through the mass media have non-rival consumption properties. Externalities could flow from the consumption of extension services dealing with areas such as disease control and soil conservation. The demonstration effect stemming from the adoption of new technology by rural innovators could also involve an externality.

In an operational context these examples of market failure may not be sufficient to justify free provision (or even subsidised provision). While the imposition of charges for services which produce positive externalities or exhibit non-rival consumption characteristics will result in an efficiency loss when compared with the social optimum, it may well be superior, or at least no worse than, the position of not charging. The question is essentially whether the costs associated with market failure are likely to exceed the costs of government failure.

Whether the free provision option is more efficient than direct charges rests on the following factors:

- the magnitude of the externality relative to the total value of the project;
- the ability of administrators to identify the socially optimal level of service and their willingness and ability to provide that level;
- the responsiveness of consumers to the introduction of charges and the nature of the system of charges; and
- the procedure for non-price allocation of services between competing consumers.

From Figure 2 it can be seen that the efficiency loss associated with the free provision of a service that exhibits substantial externalities (over-utilisation deadweight loss **B D E**), can exceed the loss associated with providing the service at the free market price (the area **A B C**). It can also be seen that the larger the external benefit, the lower will be the costs of over-utilisation where no charge is levied,

and the larger will be the cost of under-utilisation, in the event of free market pricing. These costs will also vary with the relative price elasticities of supply and demand for the service.

From a policy perspective the estimation of the efficiency losses for services which exhibit positive externalities, or non-rivalry in consumption, creates a major information problem. Even where the bulk of the resources used in an extension activity are consumed in a non-rival manner there are substantial information requirements to estimate the relative magnitudes of the over- and under-utilisation losses involved. The information requirement would include the positions of the individual consumers' demand schedules for extension.

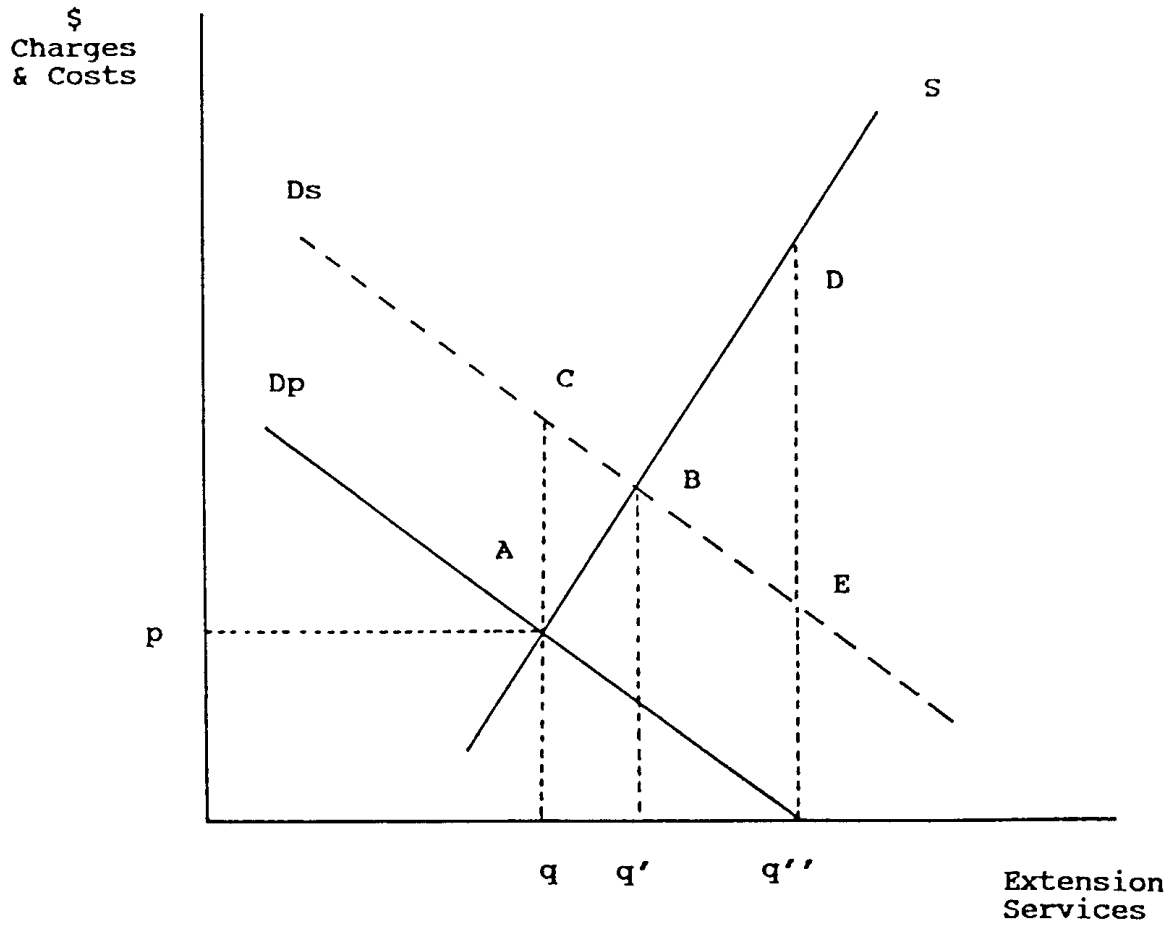
One case where the information problem is unlikely to be serious is where the services considered provide little or no benefit to the consumer of the service but substantial external gains to other groups. Under these circumstances, there is a very strong basis for arguing that charges would be inappropriate. However, it is not easy to identify extension activities which fit that category. Most areas of extension have the potential to provide substantial benefits to the consumer of the service. This is generally the case even when positive externalities are likely to be involved.

Some advice aimed at alleviating salinity may fit the category of services with small private benefits and large positive externalities. For example, the planting of trees in groundwater recharge areas may be of immense value to society but of little net direct pecuniary value to individuals expected to undertake the work. Consequently, they could be unwilling to purchase advice on the most effective way of undertaking this work. In this case the problem is wider because, in effect, they would have little incentive to undertake the work at all, let alone purchase advice on how to best undertake the task.

Landcare groups are active in this area of extension. Farmers in these groups are provided with this type of advice without charge.

However, when considering the provision of an

Figure 2: Deadweight Losses from Charges and Free Provision



A B C = cost of under-utilisation

B D E = cost of over-utilisation

A C = external benefit from services

incentive for farmers to undertake tree planting and related activities in recharge areas, it is necessary to assess whether free advice is the most appropriate form for all, or part of the subsidy. Providing all, or part of the subsidy in the form of free extension advice keeps control over how the resources are used but, in so doing, it biases individual producers' decisions on how to combine inputs. A subsidy which is tied to the targeted activity but not to specific aspects of it, is likely to be a more efficient instrument.

3.2 Positive Effects of Charges

While charges tend to reduce consumption they could also be a catalyst to changes in services which have the potential to expand consumption and/or increase the return to society from extension activities. These changes could include the improved marketing of information products, changes in the way services are allocated between consumers and the development of advisory programs that are more closely matched to the requirements of clients.

The provision of free services has the potential to mask deficiencies in product and promotional strategies. Under the system of funding from consolidated revenue there may be limited incentive for extension organisations to actively promote their organisations and their "products". Extension could well take on a production orientation with the emphasis on fulfilling internal objectives rather than meeting market requirements.

With a production orientation there is a danger that customers will tend to be seen as the end of the chain that provides the service rather than as occupying a central pivotal role in the process. Consequently, the targeting and development of information and extension programs may take place with limited meaningful input from customers. This pattern of operation could be expected to develop in an organisation that provides potentially valuable services to customers at little or no direct cost.

Under these circumstances it would not be surprising to find that many of the existing and prospective clientele did not place a high value on the services on offer. This is consistent with the situation where

individual farmers have preferred to pay market rates for a range of advisory services from private consultants rather than use government services at no direct cost. This could reflect differences in services delivered or information imperfections. Individual producers need to be able to access sufficient information to assess the value of a service even if there is no charge.

Information imperfections could be reduced through information or promotion activities by the suppliers of extension services. However the necessary promotional initiatives are unlikely to come from an organisation that is insulated from market pressures.

Better targeting of programs to meet industry needs could also flow from the wider use of charges. In opening up the extension service to market forces, charges shift the responsibility for allocative decisions from administrators to consumers. That is, services and programs would not be provided if consumers did not feel that the value of those services justified their resource cost.

In a commercial extension market all consumers will have a marginal valuation for the services at least equal to the charge. The difference between these individual consumer valuations and the cost of the resources used to provide the services is equivalent to the net social benefit concept of cost benefit analysis. The imposition of charges will generally ensure that this net social benefit is maximised. This will not be the case however where externalities are present and is unlikely to be the case where non-rival consumption is involved.

If non-price rationing mechanisms are used to allocate services to potential consumers, depending on the allocative arrangements put in place, some or all of the consumers may have lower marginal valuations for the services than the costs of providing the last unit of service. Consequently, the net social benefit associated with the services is unlikely to be maximised.

3.3 Funding from Industry Levies

The use of industry levies, as opposed to funding from consolidated revenue, effectively narrows the

basis of the tax from the general community to farmers, without linking the act of consumption with the provision of finance. This absence of a link between finance and consumption makes this approach to finance attractive where the extension service provides substantial external benefits within the industry. It would also appear to be the only means of providing industry finance for funding the use of the public media in industry extension activities.

However, the establishment and collection of industry levies does involve administrative costs. Depending on the focus or targeting of the levy, and the characteristics of the industry concerned, these costs could be substantial relative to the funds raised. Furthermore, levies are unlikely to expose the suppliers of extension services to the same degree of market pressure that would be evident with direct charges on users.

The problem of lack of exposure to market forces could be substantially reduced through the use of a voucher scheme. Vouchers remove the potential for supplier capture, and effectively leave some of the allocative decisions in the hands of consumers. Hirshleifer (1988, pp. 108-110) provides a discussion of some of the implications of voucher systems.

4. Distributional Consequences

Any changes in the way extension services are financed will inevitably have distributional as well as efficiency consequences. The distributional impact of these changes will be shared between taxpayers, users of extension services, non-users, consumers of farm products, private sector suppliers of extension and their public sector counterparts.

The distributional implications for the suppliers of extension services are relatively straightforward. To the extent to which charges reduce the demand for extension services, suppliers will be worse off. The number of people and resources involved in the extension industry would ultimately decline. However, to the extent to which the introduction of charges increased opportunities for private sector suppliers, the burden of adjustment would fall disproportionately, and perhaps totally, on the pub-

lic sector suppliers.

This distributional picture ignores the movement of staff between the public and private sectors of the extension industry. Movement of extension staff between the two sectors is common. Consequently, any adjustment pressures placed on public sector extension workers from these changes may be at least partially offset by increased opportunities in the private sector.

A simple model for analysing the distributional consequences for the remaining groups is presented diagrammatically in Figure 3. The industry is assumed to be competitive and characterised by two groups of farmers: users of extension services and non-users. The industry demand curve is initially held to be downward sloping and the price elasticity of demand for extension services is set at zero. For the industry as a whole the curve S represents industry supply when extension is financed from consolidated revenue. The corresponding supply curves for users and non-users are S_U and S_{NU} respectively. The shift in the industry supply curve to S' reflects the imposition of the costs of the extension service on the industry via charges or levies. The subscripts L and C reflect the supply consequences of the imposition of levies and direct charges respectively. With funding from consolidated revenue the free market price is P_1 .

The distributional consequences of shifting from consolidated revenue funding to the use of charges and levies are reflected in changes in the value of producer and consumer surplus' and the extent of consolidated revenue requirements. The extent of these changes under alternative assumptions regarding the price elasticity of demand for the output of the rural industry is summarised in Table 1.

Regardless of the value of the price elasticity of demand for the output of the rural industry, taxpayers gain from the implementation of charges and the users of extension services lose. The position of non-users and consumers of the farm output depends on the assumed value of the price elasticity of demand for the output. If the industry is a price taker, consumers and non-users are not affected by extension charges. Alternatively, where industry output influences prices received, charges will re-

duce the wellbeing of consumers and improve the financial position of non-users.

The selection of levy financing rather than direct charges will tend to favour users of extension services at the expense of non-users. The burden of financing extension services would be spread across all members of the industry rather than falling entirely on the users.

The value of the distributional changes reflected in Figure 3 will depend, at least in part, on the magnitude of the price elasticity of demand for extension services (see Table 2). A higher price elasticity of demand reflects the ability of users to reduce their consumption of services as prices of services in-

crease. Consequently, the negative impact of charges on users will be lessened, the higher the value of the elasticity.

If the demand curve for the rural industry is downward sloping, the greater the responsiveness of users to charges, the less will be the cost-induced increase in output prices. Consequently, the value of the price elasticity of demand for extension services will be positively correlated with the welfare of consumers of the output and negatively correlated with the welfare of non-users.

5. Delivery of Services

The historical pattern of free provision of advisory

Table 1: Impact of Charges and Levies on Interest Groups *

(a) Price Elasticity of Demand for Output less than Infinity		
Interest Group	Charges on Users	Levy on Industry
Non-users	+A	-I
User	-(B+C+D)	-B
Consumers	-F	-F
Taxpayers	+(E+F+G)	+(E+F+G)
(b) Price Elasticity of Demand for Output equals Infinity		
Non-users	Nil	-(I+J)
Users	-(B+C+D+H)	-(B+C)
Taxpayers	+(E+F+G)	+(E+F+G)

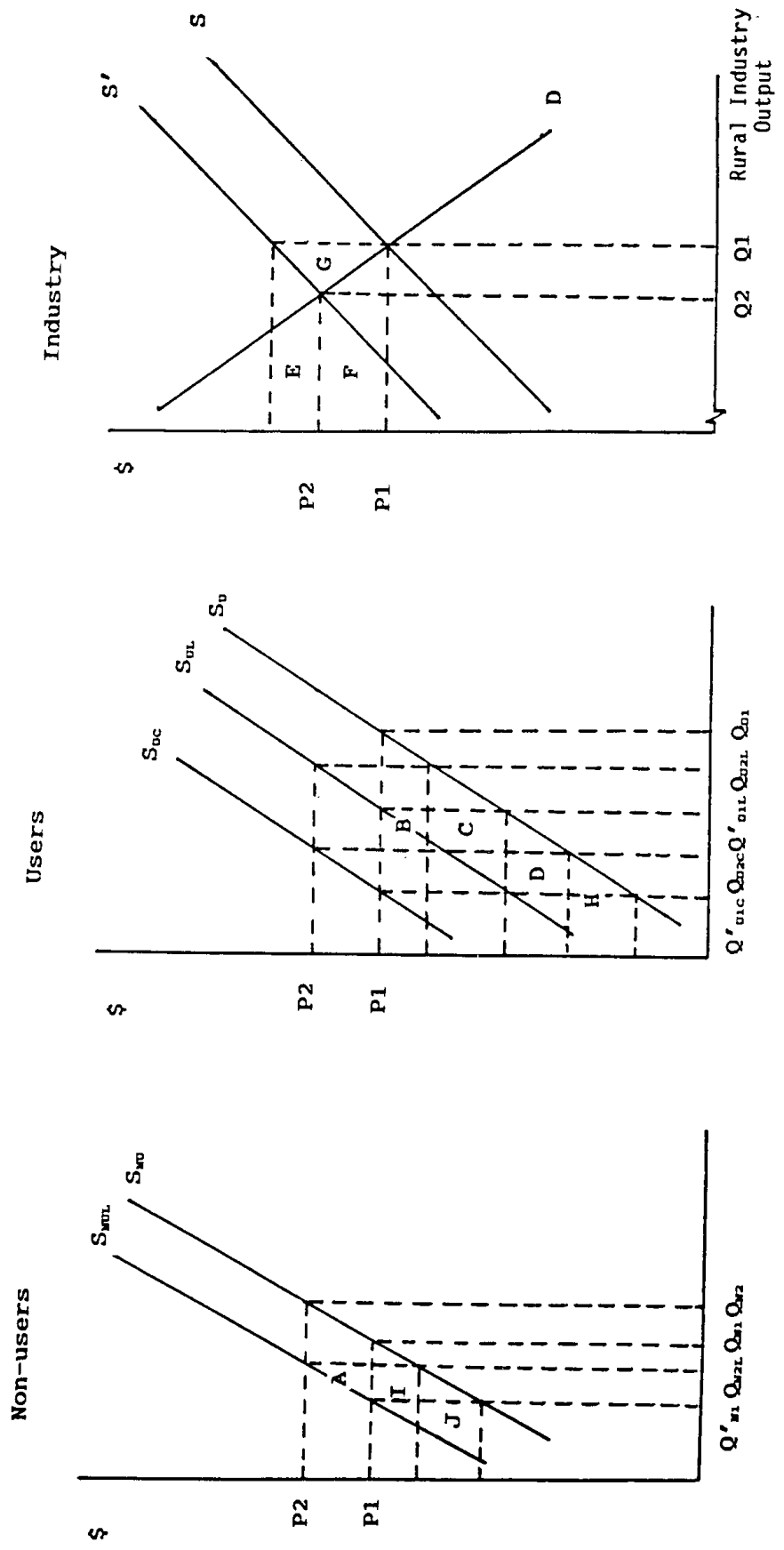
*Price elasticity of demand for extension is assumed to be zero.

Table 2: Impact of Price Elasticity of Demand for Extension Services on the Distributional Consequences of Charges

Interest Group	Impact of Increase in Elasticity on Welfare
Non-users	negative
Users	positive
Consumers	positive*
Taxpayers	neutral

* where price elasticity of demand for output is less than infinity, otherwise, neutral.

Figure 3: Distributional Consequences of Charges and Levies



services by government authorities has probably restricted the growth of the private consulting industry. Private consultants have had difficulty in attracting clients for some of their services when similar services are provided free of charge by government agencies. Consequently, it is not surprising that the recent entrance of the major dairy factories into the wide-scale provision of management advice to dairy farmers in Victoria has occurred at a time when the public sector providers in that state have been withdrawing from dealing with individual farmers.

The relationship between government extension workers and private consultants cannot be prescribed with reference to the way the service is financed. For instance, the public financing of a service through consolidated revenue does not preclude delivery by private firms. This is evidenced in the general trend towards the contracting out of public services.

Similarly, government involvement in the delivery of services (as opposed to the finance of services) cannot be precluded by a decision to fund the service through direct consumption charges. While there is some evidence that in general, government delivery of goods and services may be more costly than delivery by private firms, the method of financing a service does not seem to be directly relevant (for example see Domberger and Piggot 1986, Hanke 1987, Butler 1987, and Hensher 1986).

The argument that where a service can be charged for, it should be provided by private enterprise, ignores the possibility of cost advantages from public delivery. These advantages could arise from potential economies of scope from the linking of established regulatory and research activities and facilities with extension.

6. Concluding Comments

The wide-spread provision of free extension services is difficult to justify on efficiency grounds and may well be fiscally infeasible in the future. Many activities do not exhibit substantial externalities or public good characteristics. Even where potential market failures are evident it is not clear that they are sufficient justification for subsidisation of serv-

ices from consolidated revenue.

While the imposition of charges for activities that involve externalities (or non-rival consumption) will create efficiency costs, free services mean that administrative decisions need to be made about the allocation of resources to extension activities. These administrative decisions have the potential to impose substantial allocative costs on society and the rural sector in particular.

Charges have the potential to provide a direct indication of the type of services required through the dollar votes of all extension users. In so doing, they reduce the need for administrators to make allocative decisions and provide an incentive for organisations to adopt a more market-driven perspective. Charges also ensure that the beneficiaries of most of the extension effort (farmers, processors and consumers) meet the cost of providing those services.

A conclusion on the efficiency implications of charges cannot be drawn until a judgement is made about the likely magnitude of these administratively induced costs relative to value of any consumption distortions introduced through charges. It seems safe to argue that where the externalities are relatively small and non-rival consumption is unimportant, charges are desirable.

No blanket judgements can be made where externalities are substantial or a significant non-rival consumption problem exists. The traditional policy prescription would favour subsidised delivery. However, in an imperfect world characterised by poor information, opportunistic behaviour and conflicts between bureaucratic and public objectives, there is no reason why this option will necessarily be superior to fee for service.

A shift towards funding from levies offers the virtue of decoupling the act of consumption from the provision of the finance while reducing reliance on funding from consolidated revenue. As such it appears an attractive option for services that produce externalities or are associated with public good characteristics. However, levies place greater burdens on non-adopters and may insulate providers from market pressures. If levies are to be used

attention needs to be addressed to the corresponding introduction of extension vouchers for farmers.

The traditional dominance of government agencies in the delivery of services is showing signs of declining and prospects exist for growth in private consulting activities. This growth will create a need for researchers and government extension operators to re-evaluate the way they interact with private consulting firms. More attention also needs to be given to the issue of how and when this change in delivery mode occurs.

There would appear to be no sound theoretical basis for establishing a nexus between extension funding and extension delivery. Critical analysis needs to be undertaken to identify the possible cost consequences of alternative modes of delivery of extension services. Decisions on mode of delivery of services should be made on a case by case basis supported by comparative cost information. Ultimately, the question of how extension services should be delivered rests on who can do the job most efficiently.

The private interest theories of regulation would suggest that an even wider use of levies may be supported by government organisations involved in the delivery of advisory services and some groups of farmers. Government organisations may support this option because it reduces their dependence on consolidated revenue for resources while not necessarily exposing the organisation to the vagaries of the market. Similarly, farmers who are extensive users of advisory services could well support the notion because it would guarantee the continued provision of the services as well as ensuring that the burden is spread throughout the industry.

The losers from the wider use of levies would be rural producers who do not use extension services.

Finally, as long as some services are to be provided without charges or vouchers, the allocative decisions made by extension administrators will have a major bearing on the social returns from extension. Consequently, attention needs to be focused on the requirements of consumers and the approaches used to establish the level and nature of the service. Failure to identify the most appropriate level of

service has the potential to negate any gains which may have been forthcoming from avoiding charges.

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