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Research Article

LAND RESOURCE MANAGEMENT POLICIES IN SOUTH AFRICA: SUBSIDIES AND REGULATION

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ABSTRACT

A review of the South African agricultural policy is already well underway. One item that is gathering considerable attention is managing of natural agricultural resources. The main concern is soil conservation subsidies, and regulation of land use. Despite, heavy financial investment by the government over the past years in this area, land degradation continues to pose a threat to the agricultural and other sectors of the economy.

This paper seeks to address two questions raised by these concerns. First, to what extent are subsidies and regulation consistent with meeting national policy objectives such as increased growth, environmental protection and equity? And second, if and where policies are not meeting those goals, what policy actions and or changes are appropriate? A qualitative analytical approach is used to examine the current policy instruments.

The paper concludes that the current policies with regard to land resources are not socially desirable. There are no positive externalities that justify the continuation with the subsidy policy. Subsidies are countering the national objectives. In addition, high administration costs of regulation have made it not a viable policy instrument to achieve a surplus- increasing outcome. Taxing the negative externalities and investment on research and technological development are critical to achieving the best possible standard of living.

INTRODUCTION

Land Resources Management Policy Environment

Land resources exhibit characteristics of partial exhaustible resource. Any actions farmers take regarding these resources can have uncertain consequences and the effect of these actions sometimes cannot easily be reversed. Therefore, in this respect land use policies that encourage farmers to use resources in a sustainable manner are critical in the agricultural.

The government of South Africa has long recognized the importance of land resource conservation. At least from 1946 to the present, several soil conservation Acts were promulgated to address the problem of land resource degradation as a result of farmer's decisions on land use. In 1946, the first Conservation Act no 43 of 1946 was promulgated. The objective of this Act was to make provision for government financial assistance on soil conservation works and the establishment of soil conservation institutions at regional levels. The Soil Conservation Act no: 76 of 1969 replaced this Act. The important feature of the new Act was the emphasis on the command and control approach to managing land resources. This Act also allowed the government to regulate land use by giving directives to farmers and, enforcing grazing systems.

In 1984, the current Conservation of Agricultural Resources Act no: 43 of 1983 were introduced. This Act, like the others was primarily brought by the past regime to secure the protection of agricultural resources in the large commercial farming sector. The so-called former homelands were not covered in this Act. This plan for regulation and supplying of subsidies to individual farmers for soil conservation activities, for a long time this has shifted the cost of abating land degradation to the government, and creating artificial farm profits. This Act has encouraged farming in ecological fragile lands and that has worsened the land degradation situation in South Africa.

The Administration and Maintenance of this polices have over the years created financial pressure on the government and brought economic distortion in the sector. The annual government expenditure on Land resources management is estimated at R130 million. Despite this high level of investment, Land degradation continues to pose a threat to current and future production potential of the South African agricultural sector.

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The problem of degradation of the soil stock and loss of production potential continue to be a problem. In 1992/93, total costs of land resource degradation were estimated at R1.9 billion; some 14.6 percent of agricultural GDP (*van Zyl et.-al.,* 1996). About 400 million tons of soil is lost annually in South Africa (*Eloff et.-al.,* 1998). An estimated total of R 12 million is lost annually due to invader plants (Van Wyk, 1997). The total cost of land degradation, including rehabilitation of degraded land, regulation enforcement, nutrient loss, research, and costs related to silting and pollution of rivers, dams and harbors, worsen the situation.

As a result of democratization in 1994 and new government priorities, the radical changes in thinking were evident in all areas of policy, but are more complex in some areas such as in resource management. Agriculture, more than other sectors of the economy was exposed to large economic distortions and policy failures. The need for food for an isolated country and a political motivated land market required interventions by the government. The Act 43 of 1983 was part of government policy instrument used by the regime to achieve national objectives, namely; Economic growth, environmental protection and food security. The government supplied subsidies to farmers for conservation activities. This policy exacerbated environmental problems resulting from over intensive use of the land and the encroachment of farming on fragile habitants.

In the context of the macro policy reform, South Africa cannot afford to continue with the traditional approach with the emerging farmers under the reform program given its position in the global economy and the greater need for more equitable distribution of wealth among its people (Vesfield and Nduli, 1998). In this respect, the heavily subsidized approach to on-ground soil conservation works, delivered to white commercial farmers through expert technical advice and Soil Conservation Committees, is no longer appropriate given South Africa's post -apartheid policy framework (Critchley, 1998). The new policy directions recognize that subsidies are often part of the problem rather than part of the solution and can impede the necessary changes towards a more open and internationally competitive agricultural sector (National Department of Agriculture, 1997).

The problem of land degradation is not unique to South Africa. Australia has also been faced with a land degradation crisis since the European arrive and this was attributed to poor land use decision. The estimation of the cost of land degradation was put at $1.5 billion per annum (Gretton and Salma, 1996). There is a history of failed policy attempts to deal with this problem (Powell 1993). In most cases the public policy responses have nearly always been implemented after the event to address symptoms rather than causes.

The objective of the paper is to review the current land resources management policies of the South African Department of Agriculture and examine whether they are achieving social optimal level. Special, this paper focuses upon the issue of government subsidies and regulation of land use on private farms in the context of the current agricultural policy reform process. Essentially it seeks to examine the role policy instruments might play in reducing negative externalities and increase positive externalities so to achieve socially optimality level.

The paper seeks to address two questions raised by these concerns. First, to what extent are subsidies and regulation consistent with meeting national policy objectives such as increase growth, environmental protection and equity? And second, if and where are the policies are countering those goals, what policy actions and or changes are appropriate.

Findings of this study will provide an economic framework for future policy development in the area of Land Resources management. It is envisaged that the framework will promote a philosophy of encouraging positive externalities and penalize negative externalities. This measure will ease the financial pressure on government and stimulate economic surplus increase.

Theoretical Framework and Analytical Methods

According to related literature, land degradation results in two kinds of costs. The first of these is on-farm costs from decreased yields and increased production costs. On-farm costs today are reflected almost entirely in a reduction in future net farm income due to erosion today. As land degradation proceeds, its cumulated impact is evident in the reduced crop yield. On-farm productivity loss and nutrient value loss have been estimated at approximately R1041 million for South Africa, in 1992/93 (*Van Zyl et al.,* 1996). Traditionally, efforts to reduce soil erosion in South Africa have been directed at the preservation of soil productivity.

The second cost is the social cost (off-farm or externalities) due to environmental pollution, silting of rivers, and so on. Part of this cost is the loss in future agricultural productivity, but it refers, primarily, to the externalities of land degradation such as; water and air pollution. These costs accrue to society and are difficult to quantify because there are many "intangibles" involved, although, many argue (e.g., Van Zyl 1996) that these may be the largest cost of soil erosion. Estimates of the costs of off-farm damages have often been greater that the cost of productivity reduction on the farm (Van Zyl 1996) so the programs and policies directed toward the reduction of land degradation and sediment delivery may be more beneficial to water users than to farmers.

One of the most accepted policy prescriptions is making polluters pay (tax) for the costs they impose on other people (*Zilberman et al.,* 1993). In general, that policy is not applied in South Africa. For example, in the case of soil erosion, the increased sedimentation in rivers and land degradation is a form of pollution, which contributes to financial losses for farmers because of the reduction in productivity and expected returns in the future. The society pays for the additional costs of off-site environmental damage related to increased sedimentation in the rivers and near-shore coastal waters. Under the polluter pays concept the principal agent for land degradation (farmer) should bear the financial costs. On the contrary, those who generate positive externality are encouraged by subsidies to provide more.

In order to answer the main question whether the current policies with regard to land resource use are achieving social optimal level or not. A qualitative analytical approach will be used to examine the current policy instruments used by

government to address externalities generated by agricultural activities in private farms. Namely; Subsidy and regulation.

The paper seeks to address three questions raised by these concerns. First, to what extent are subsidies and regulation consistent with meeting national policy objectives such as increase growth, environmental protection and equity? And second, if and where are the policies are countering those goals, what policy actions and or changes are appropriate.

In the process of addressing these questions, the paper will examine the claim that farmers deserve more subsidies to combat land degradation. Are there any positive externalities produced by farmers as result of these incentives? If so, to what extent if any are those farmer-produced externalities undersupplied? And where there is under- provision, what are the most efficient ways to achieve social optimal levels. The paper will also examine whether regulation is a prefer instrument to taxation of externalities. How transaction costs might have affected the ability of policy makers to reach the social optimal level in 1992/93.

Current Policies Regarding Land Degradation

Analysis is applied to data, which is based on the direction of subsidies and regulations, provided under the soil conservation Act 43 of 1984. The magnitude of the government subsidies and administration cost of the regulation are based on expenditure for the year 1992/93.

The estimated Government subsidies for soil conservation were R60 million. Article 8 of the soil conservation Act make a provision for subsidies for the purpose of fencing grazing land, soil drainage, soil conservation works (includes construction of contour banks and Waterways) and supply herbicides for removing of weeds.

In addition, government intervenes by setting standards; farmers have to adhere to when using the resources. 300 inspectors who are permanently employed by the government enforce these standards and they are deployed throughout the country. Further more, the Act makes provision for the formation of soil conservation committees who are paid by the government to complement the work of the inspectors. The cost of enforcement and administration was estimated at R70 million in 1998 (Van Wyk, 1997).

In spite of all these interventions, Land degradation is still high, sedimentation of dams continues to increase and costs of purification and maintenance increases.

Table 1 Land Resource Depreciation and externality cost

Type of Land degradation	On- farm cost (Million Rands)	Externality Cost (Million Rands)
Water Erosion	240	0
Wind Erosion	20	0
Soil Crusting	80	0
Soil Compaction	68.5	0
Increase acidity	228.5	0
Salinization and water logging	85.7	0
Overgrazing	334.9	0
Sedimentation of dams		285.7
Increase cost of purification and maintenance		571.4
Total	1041	857

Source: Van Zyl, Kristen, and Binswanger 1996

The total cost of negative externalities was estimated at R857 million in 1992/93 (*Van Zyl et al.,* 1996). This cost accounts for 71 percent of total annual cost due to soil erosion. Prices of farm produce continue to increase. On-farm cost and Externalities cost is summarized in Table 1

Analysis of Welfare Economics of Natural Resource use

Given the direction of subsidies and Regulation Instruments used by the South African government. It is evident that the externality costs generated by farmers through there farming activities are substantial. The estimated total cost arises from negative externality was estimated at R1.9 billion and this cost is paid by the society. Consequently, there is no evidence of any positive externalities generated by the farmers, which would make them qualify for a subsidy. A subsidy for removing weeds is generating more externalities by increasing water pollution from the chemical and it also encourages farmers to leave land underutilized. Hence subsiding farmers is not surplus- increasing. However, subsidies on construction of Waterways are surplus increasing because it is a public good.

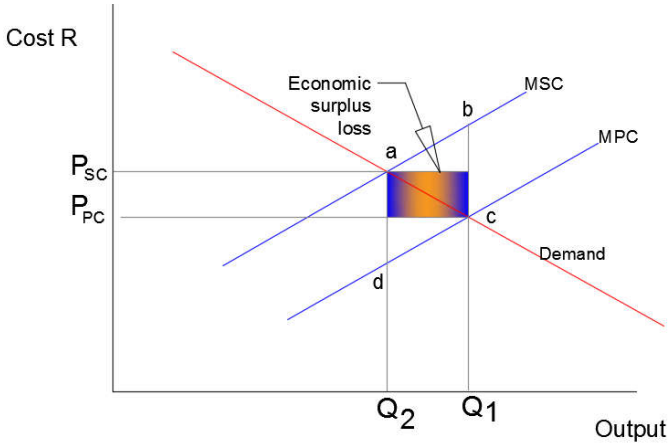

Figure 1 Private cost versus social cost of production

As illustrated in figure1 there is a divergence between the cost of production that incurred by farmers and that of the society. This divergence is due to market failure; hence government must intervene to correct the failure. In contrast there is no divergence between marginal benefits. Therefore, the farmers generate only externality costs and are paid by means of subsidies from the government. In the long run these subsidies induce introduction of new sources of pollution as individual farmers see the gain associated with the subsidy. It is evident that the continual increase in soil loss, accompanied by high level of dam sedimentation is not surplus increasing.

Equally, the regulation instrument is not surplus increasing for two reasons: 1) High transaction costs have affected the ability of government to reach a surplus that maximizes outcome. Implementation cost for the regulation instrument is estimated at R70 million per year and 2) Because of the ratio of inspectors to hectares (1 to 50000) it is difficult to enforce these standards. However, even when the regulation is successful, the social benefits are offset by increase price due to a decrease in production. This is because farmers prefer to live part of their land under utilized if they fail to meet the standards to avoid prosecution. This creates economic rents for the farmers, and surplus losses to the consumers. Hence the regulation instrument is not surplus- increasing.

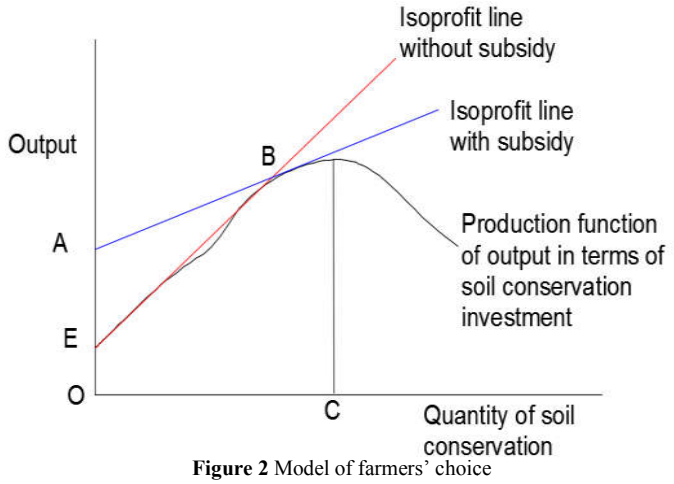

Figure 2 Model of farmers' choice

II= Pm QM – PswcQswc II = Pm QM – Qswc (PSwc- Ps)
Where Qsc = level of investment on soil conservation activities
Qm = Level of output
Pm= Price o f output
Psc = unit cost of soil conservation activities
Ps = Government subsidy
Isoprofit Lines
Isoprofit line without = Qm=II/Pm + (Psc/Pm) Qsc
Isoprofit with subsidy = Qm = II/Pm +((Psc+Ps)/Pm) Qsc

Increase profitability of farming through higher prices and low cost make conservation more attractive to farmers. Figure 2 illustrate Iso- profit lines and best operating conditions for soil conservation response process. Best operation occurs at B where the marginal product of soil conservation equals the slope of the Isoquant. The Isoporfit line with subsidies satisfies this condition. However, the slope of the isoprofit without subsidy is steep and ,hence it does not satisfy the condition. Maximum profit will be represented by price of output *x* OA. Conservation level at point C gives the highest profit under a given cost of conservation and output price.

What does this mean for the current South African policies? The farmers will adopt low level of soil conservation activities without subsidies, since cost of conservation is high, compared to the output price. However, the government has been giving subsidies over the last 30 years but there is no improvement in soil conservation adoption. The possibility could be that this subsidy induces new sources of pollution as individual farmers see the gain associated with the subsidy.

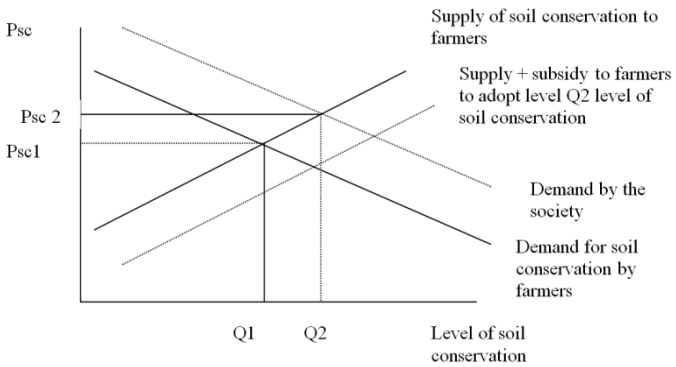

Figure 3 Model of government choice

Psc= Cost of soil conservation

The model in figure 3 illustrates subsidy on a positive externality. The two-demand curves represent the divergence between private marginal benefits and social marginal benefits due to soil conservation activities. The difference represents the marginal external benefits (positive externality). The supply curve represents the marginal cost of soil conservation without a Subsidy and with a subsidy. The subsidy is meant to induce farmers to adopt level Q2 level of soil conservation.

Although the South African government has a long history of providing subsidies for soil conservation activities as provided in the Act no 43 of 1983, farmers have failed to provide level Q2 of soil conservation. This is evidenced by the high-level off-farm cost incurred by the society in the form of siltation and other runoff problems.

CONCLUSIONS AND POLICY RECOMMENDATIONS

The paper examined the effects of subsidy and regulation policy instruments on economic surplus. The current policies instruments with regard to land resources are not achieving social optimal level; hence there is no justification for subsidies. In addition, the subsidies are not consistent with meeting growth, environmental protection and equity goals. There is high on-farm productivity loss and the society continues to incur costs off- site environmental damage related to increase sedimentation in rivers, dams and other run off problems. There is urgent need internalize these costs into the of soil conservation in South Africa. Farmers continue to generate negative externalities farmers' production prices via taxes. By taxing these negative externalities, the goal of social optimality level will be achieved.

High administration costs of regulation have affected negatively, the government ability to achieve a surplus-increasing outcome. This is show by the high implementation cost and the failer of enforcing standards due to personnel constraint. The regulation instrument also encourages farmers to underutilize land and that created economic rents to producers and surplus loss to consumers. Therefore this instrument is not surplus –increasing.

Low profits discourage farmers on private farms to adopt soil conservation practices. Increased of profitability of farming through higher prices and low cost will make conservation more attractive to the farmer. Soil conservation without government subsidies does not improve profitability in the farms. Hence farmers are unlikely to voluntarily adopt substantial soil conservation practices. Investment on research and technological development that brings down the cost of soil conservation is critical to encourage farmers adopt conservation practices.

Despite the provision of subsidies to farmers, there is no evidence of increase in adopting soil conservation measures. Consequently, there are no positive externalities that justify the continuation with this policy instruments. Although, it is difficult to determine whether the level of degradation would be different without subsidy, there is evidence that it is countering the national objectives by inducing the introduction of additional environmental damage.

The appropriate government intervention is to provide instruments that address off- farm costs. Appropriate intervention on- farm cost would be investing on research and technological development.

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