EFFICIENCY OF LAND USE

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Abstract

In the communal agricultural sectors three reasons for market failure were advanced (a) free access to communal grazing which is a problem if the group is larger than the immediate family (b) lack of incentive to invest in improved pastures and fodder production due to the free rider situation and (c) opportunity cost of land differs from what market forces will determine. Commercial land expropriated should be resettled on a private individual tenure basis by small scale farmers and not on a communal basis. Under a communal system the return (rent) on grazing land is zero while the return on arable land is low due to lack in permanent tenure. This explains idle arable land in KwaZulu in spite of population pressure. The rental value is the cost to the farmer for non usage of land if it can make a positive contribution. The market mechanism penalizes the commercial farmer for the non usage of commercial land. A land tax does not increase this cost and will thus not bring unproductive land into production. (The supply of land is not perfectly inelastic due to improvements). Taxes on agricultural land have certain advantages such as (a) avoidance less possible than income taxes(b) a wealth tax and (c) may better target to wealthy landowners who with the assistance of tax experts are better able to avoid taxes. Disadvantages of land taxes are that administration cost may be high and the tax is the same in good and bad years.

Uittreksel

Doeltreffendheid van grondgebruik

Drie redes waarom die mark faal in 'n kommunale grondgebruikstelsel is (a) vrye toegang tot kommunale weiding wat 'n probleem is as die groep groter is as die naby familie (b) onvoldoende insentief om te belê in verbeterings soos weiding en voer as gevolg van "free riders" en (c) die geleentheidskoste van grond verskil van wat markkragte sal bepaal. Kommersiële gronde wat onteien is moet hervestig word op basis van 'n privaat grondbesitstelsel deur kleinboere en nie op grond van 'n kommunale stelsel nie. Onder 'n kommunale stelsel is die rente-opbrengs, ("rent") op weiding zero en die op ploeggrond laag weens afwesigheid van permanente privaat besitreg. Dit verklaar waarom grond dikwels onbenut is in bestaanslandbou ten spyte van bevolkingsdruk. M.b.t. die kommersiële boer, die markmeganisme penaliseer hom indien by nie sy grond tot die optimum benut nie. Die "rent" of verhuurwaarde is die wins wat die boer inboet indien sy grond ongebruik word en is dus die geleentheidskoste van grond. Die aanbod van grond is nie perfek onelasties nie a.g.v. verbetering en 'n grondbelasting sal die aanbod na links verskuif en nie na regs soos dikwels gemeen word nie. Grondbelasting het voordele soos (a) omseiling minder moontlik (b) belasting op rykdom en (c) kan meer rig op welgestelde grondeienaars wat met behulp van belastingdeskundiges beter daartoe instaat is om inkomstebelasting te omseil. Nadele is dat administrasiekoste is hoog en die belasting is dieselfde in goeie en swak jare.

1. Introduction

It is important that agriculture produces an abundance of food at reasonable prices. This is more evident in South Africa where a large proportion of the population has low purchasing power. The efficiency and equity of land use should thus not be judged solely in terms of its impact on farmers but also as far as it impacts on consumers. Some policy reforms could promote more equity and efficiency and these policies are clearly desirable from a welfare standpoint. For example the current restricted access to commercial farm land may be inequitable and inefficient. However, when a serious trade-off exists between equity and efficiency it is possible that more equity on the farming side could lead to more inequity on the consumer side, if it translates into higher consumer prices. The efficiency in use of agricultural land is an important goal under any political system. It is thus not surprising that all political parties, inside and outside the present government, subscribe to this goal.

The inefficient use of land is probably the single most important factor explaining the failure of food production in planned economies such as the USSR. Mr. Gorbachev recently proposed a leasing market in agricultural land in order to promote more efficiency in the Soviet Agriculture. This is an acceptance that economic forces through a market for agricultural land could better allocate land for optimum use. World events have shown that military hardware can be produced efficiently under conditions of central planning. Examples are the Soviet army and Armscor in South Africa. Food production, however, fails under similar conditions as individual managerial decision making is decisive. Food shortage and empty shelves are some of the most serious problems faced by the Soviet leader. Amongst the empty shelves in a new supermarket in Moscow, was a large consignment of butter just received from Finland, a shopper remarked "we are fortunate that we did not make Finland one of our provinces". It is important that we look at the conditions that promote efficient land use.

2. Rules of the market and efficiency

The market mechanism promotes efficiency given the constraints and rules faced by the market. It is important that the rules of the market and its legal framework should be in accordance with international standards and requirements. In the spirit of this it is expected that Land Acts of 1913 and 1936 will soon be repealed, providing equal access and equal opportunity of agricultural land to all. This case has been stated by others (Fenyes et al, 1988; Van Rooyen, 1989). As far as small scale agriculture is concerned, support services are required for this sector to reach its potential. Political and social stability is desirable for an efficient market which may not be possible if people are unemployed and hungry. Due to interdependence in benefits from social stability a "free rider" situation arises and the state should accept part of the responsibility. Improvement in areas such as food nutrition should thus be national objectives.

The equity in ownership of agricultural land has been widely debated in South Africa in recent months and is at the top of the political agenda. This paper on efficiency does not intend to detract from the equity issue. Whereas the equity issue is largely a political problem, efficiency of land use can be promoted by a market economy. How the market performs this function is not fully appreciated.

3. Market for land

The establishment of property rights is an essential feature of such a market. Property transfers are possible through sale and/or lease of land. In such a market the price of land and its rental value are known. The rental value is a rent in an aggregate sense, but an opportunity cost for the individual farmer. The rental value is the cost to the farmer for the non using of land. The market mechanism thus penalizes the non using of agricultural land that could make a positive contribution to society. If land is not used, the farmer suffers from either reduced profits or reduced rental income. The opportunity cost is the same whether the farmer bought the land or inherited the land i.e. whether he acquired it by matrimony, parsimony or patrimony. If the land is idle when a land market exists then the non use of the land may be attributed to development costs exceeding benefits, high transaction cost, or the holding being so small that potential benefits from renting is negligible. Under these conditions, land use efficiency cannot be promoted either by subsidies paid to agriculture in the form of subsidy on mortgage bond or by taxing agricultural land. Land taxes do not increase the cost of non usage of the land to the owner. If land in Viljoenskroon rents for R120 per ha, the cost of non usage (income sacrificed) of that land is R120 per ha. If the land tax is R50 per ha, the cost of non usage of the land comprises of R50 tax per ha and R70 potential rental income per ha, summing again to R120 per ha. For efficiency, the following conditions must be met:

(a) Establishment of property rights.
(b) Transaction cost must be small.

The establishment of property rights ensures that the farmer benefits from his own investment in land, otherwise the investment will be sub-optimal.

In a rental market for agricultural land, transaction cost may be high because rent is not paid in advance. Income from rent depends on tenants characteristics which are not known in advance. Problems such as moral hazard and adverse selection may appear if tenants neglect the property (Bell and Sussangkorn, 1988).

4. Market failure

The lack of performance in traditional agriculture in Africa is a complex problem. Although African tenure arrangements are a part of the problem,individual tenure will only be accepted if it benefits all market participants. The argument for individual tenure as the foundation for economic incentive is, however, seen by some as the views of free enterprise economists (Okoth-Ogendo, 1986).

Recent developments in China, showed that provinces bordering on Hong Kong are more receptive to movements towards a market economy. The conversion of some communal land to individual holdings took place in Europe 200 to 300 years ago and it is also happening in several African countries, including Botswana (Dickson, 1986). In traditional agriculture a market failure situation arises and market forces cannot promote the efficiency of land use. Reasons why markets fail will be discussed.

4.1 Free access to communal grazing

According to several livestock experts, an open access situation exists in KwaZulu (Lyne *et al*, 1990a). Mortality rates in KwaZulu are twice that of the commercial sector, while the calving percentage is 32 per cent in KwaZulu and 80 per cent in Natal. Market failure arises from externalities in the sense that private and social costs differ. If one farmer reduces his stocking rate, another will increase his.

4.2 The incentive problem in communal grazing

Under a communal grazing policy, little incentive exists to provide winter fodder and to establish pastures as somebody else's cattle may graze on your pasture. This "free rider" problem arises even if access to communal grazing is restricted. There is little evidence of improved pastures or fodder production on traditional farms in KwaZulu in spite of relatively high mortality rates and low calving percentages.

4.3 Opportunity Cost of Arable Land

Although farmers have individual user-rights to arable land, they do not have title to land and land transfer is not common. In some areas a rental market in land has started to emerge. If the individual cannot rent out his land, the opportunity cost of this land is zero, which is different from the use of land from society's view. If land renting is permitted land will achieve a rental value. Renting will provide a more efficient allocation of land and imposes a cost on the owner (opportunity cost) for non utilization of the land. The efficiency with which land is used can to some extent be judged by the rental rate of land. Policy prescriptions are:

(i) to encourage privatization in areas where it is acceptable to households. The cost of privatization such as fencing and provision of water holes also needs to be considered,
(ii) promote a renting market for agricultural land or
(iii) alternatively overgrazing can be tackled by group action as suggested by Vink. Group action may be unlikely where the group is large (Lyne *et al*, 1990a).

5. Renting market in land

Surveys conducted in KwaZulu indicate that 80 per cent of arable allotments are smaller than 2 ha. The small size of holdings implies that farm profits even under optimal technological conditions are unattractive compared to wage employment for the more skilled adult male members. The under investment in traditional agriculture is partly attributed to the lack of incentive to invest in agriculture.

A comprehensive study undertaken in KwaZulu indicated that farmers who rent land are surplus producers (Nieuwoudt and Vink, 1989). This finding was based on a discriminant analysis of 469 households. Although privatization of land may promote resource efficiency it meets with resistance from entrenched interest groups. As a second best solution, the creation of a rental market in land, leads to farm consolidation and increased earnings from agriculture. The rental rate establishes an opportunity cost in land, promoting an optimum allocation of land. Efficiency is improved as land in traditional agriculture is often idle in spite of population pressure (Gibbs, 1988). Also, since renting is voluntary, benefits would accrue to both owners and users of land.

Although renting was significantly more for surplus farmers, land holdings for this group were not significantly larger than for deficit farmers. The important implication is that renting of land ensures that the resource moves to its best use as it is rented by the party who can make the best use of it. On the

other hand, farmers with more land may have little inclination to farm. In the absence of a market for land, little or no opportunity cost is attached to non usage of land.

Providing infrastructure for development not only entails roads etc. but also a legal environment. For example a prerequisite for a renting market is the protection of property rights. A reason why renting is not more common in KwaZulu is the custom that if somebody else cultivates your land, you may lose your rights to the land (Lyne, 1990b). A renting market does not create a landless class, as the original owner still retains ownership.

Due to problems such as moral hazard, a renting market in agricultural land is seen as second best to the situation where a market exists in both rentals and property.

6. Market in agricultural property

Property right to land should not entail an unlimited right to the use of land. Society expects from the farmer to conserve the land for future use. Within this spirit, the establishment of property rights and legal ownership promotes productivity. Secured ownership affects both the availability of credit and investment incentive. Increased insecurity increases the uncertainty whether the farmer will be able to benefit from his effort, leading to sub-optimal investment. Under secure ownership, land can be used as collateral. These farmers are better able to secure low cost finance. Insecurity of ownership is thus regarded as an important source of low productivity (Feder *et al*, 1988). In studies it was found that traditional farmers switch from crops to raising cattle because cattle can be used as collateral but not land (Feder *et al*, 1988). A study in Thailand by the World Bank showed that security of ownership significantly affected farm investments, land improvements, use of farm inputs, productivity and the use of land (Feder *et al*, 1988). Naledzani (1988) showed, using discriminant analysis, that a more intensive and efficient use of resources occur under private ownership in KwaZulu.

According to Lyne (1990b) since no urban and rural property rights exist in KwaZulu, no incentive exists to invest in urban and rural properties. Income is thus not recycled in the communities but spent outside. If property rights in rural villages are established, these villages will attract outside investment. The consequent growth in villages will relieve the population pressure on farm land, leading to a more efficient use of land (Lyne 1990b).

A major criticism of establishing property rights in the sale of land in traditional agriculture is that it creates a landless class, in the wake of serious unemployment. This problem does not arise on commercial farms expropriated by the State for resettlement purposes. It is strongly suggested that private property rights should eventually be established on these farms.

7. Efficiency and resettlement

The S.A. Development Trust has expropriated land in South Africa for resettlement purposes during past years. Although political and equity aims are important in resettlement, the maintenance of productivity should also be a prime objective. It is suggested that efficiency can best be promoted under a system of small scale emerging or larger scale commercial farming. Whether small or larger farms are appropriate depends on the technology base.

The Zimbabwean Model A resettlement is a further extension of the communal land tenure system. Their Model B, is a cooperative farming unit that maintains the high technology structure of the acquired farm (Tax Advisory Committee, 1990).

It may be instructive to compare different land tenure systems against economic criteria such as market failure and economic incentives. For instance under a cooperative system all externalities of costs and income are internalised but individual incentive may be lacking. The latter comment may also apply to the Kibbutz system.

Under a communal system externalities can lead to market failure. The Zimbabwean small farmer support programme is seen as a success (Vink, 1990; Weber *et al*, 1988). Various examples of success of small growers are reported in Zimbabwe and in South Africa (Van Rooyen, 1989). Lyne (1990b) also observes that more success is achieved in traditional agriculture where employment outside this sector is scarce as in Malawi and Zimbabwe. Yields on resettled areas in Zimbabwe are, however, lower than in commercial agriculture (Ministry of Lands, Agriculture and Resettlement as quoted by the Tax Advisory Committee, Minister of Finance, 1990; Weiner *et al*, 1985). The question is raised whether yields in Zimbabwe would not have been higher under a small grower emerging commercial farmer programme. Market failure is an even greater problem in communal grazing than in crop production because in the former the "free rider" situation also emerges. A comparison of tenure systems requires that both crop and livestock production need to be considered. This author thus does not agree with Weiner *et al*, (1985) that the farming mode (tenure) is not important and that differences in productivity can be explained by differences in support systems and climate.

8. Property rights and externalities (further examples)

Some examples of market solutions where market failure exists, will be discussed.

8.1 Lala Palm in KwaZulu

Palm wine, produced from the sap of the Lala Palm tree is one of the most important export products of Maputoland, N.E. KwaZulu. Common ownership of this resource led to over harvesting and, it was feared, eventual destruction of this natural asset. The local government then allocated a plot to each tapper. As each plot was privately developed, overtapping stopped and the land was efficiently developed.

8.2 Game Ranching, Fishing

Where game is not privately owned (due to inadequate fencing) near the Blyde River, Hoedspruit regulations and taxes such as hunting licenses and open and closed seasons are used to prevent over harvesting. It has been stated that in Italy more hunters get killed than game. Externality arises from overcrowding and hunting licenses are required. Where game is privately owned (due to adequate fencing) such as Springbok in the Karoo, no hunting licenses are required and game numbers are not declining. The high cost of fencing for the larger animals, however, is the main problem in establishing property rights in animals. Game conservation has been highly successful in South Africa and the current steps towards private ownership of the Rhino also look promising. Establishing property rights in fresh water fishing in KwaZulu and salt water fishing in Japan have been successful.

8.3 Pollution

The externality arising where a factory pollutes a river damaging crops downstream can be solved by the market. A Pareto - optimum solution exists in this case according to the Coase theorem provided that:

(i) property rights exist and
(ii) transaction cost is zero.

9. Zoning of land

Zoning land for specific purposes is common in many countries. The reason for zoning is that the market fails under certain circumstances to efficiently allocate land say between agriculture and urban development. Zoning can be undertaken either by regulation or through a tax rebate for an agreement to retain land in agricultural use as in the Michigan programme (Anderson and Bunch, 1989).

The economic argument against zoning is that, can politicians or bureaucrats do a better job in allocating land than the market given imperfections of the market and imperfections of the political process? Imperfections in the political process can arise through vested interests and inside information in reclassifications. Mills (1989) asks whether zoning is a negative sum game, in the sense that costs outweigh benefits. Costs and benefits depend upon the specific situation. Concern has been expressed about the withdrawal of land from agricultural use if Act 70 of 1970, prohibiting the subdivision of land is repealed. Freedom of choice maximises the welfare of the individual in the use of his land but it may lead to the withdrawal of fertile land from food production in often highly populated areas where food prices are already higher than in urban markets. The further increase in food prices could be seen as an externality and reason for retaining land in food production. Groenewald (1973) contends that since certain characteristics of the soil such as depth and fertility are important to agriculture but not for uses such as urban development, a case could be made for retaining land for agricultural use.

10. Can efficiency of land use be measured?

Pasour and Bullock (1975) contend that a farm will always be efficiently run, given its constraint environment. Focus should thus be on the constraints faced by the farmer.

Nevertheless, economists still attempt to measure efficiency. In a recent paper, Weiner *et al*, showed input/output ratios in Zimbabwe for different tenure systems. Input/output ratios are useful when farms are compared over time, but in a cross sectional comparison several problems are encountered, such as:

(i) the input/output ratio may be low due to under investment
(ii) which inputs are included etc.

It is contended that agricultural efficiency should be judged by the returns captured by the scarce resource, in this case land. If returns from the limiting resource are higher then the implication is that the resource is more efficiently used. The rental rate of agricultural land is the return to land, allowing for all costs including management and risk. In the longer run all costs become variable and a longer run lease could thus be seen as considering all farming costs. In a market, the rental rate would be similar for similar farms. Where tenure forms differ, however, it is possible to make a comparison as to the efficiency of land use by studying the rental rate per ha for a system or market where renting is not restricted, compared to a tenure arrangement where the renting market is incomplete. The above procedure is seen as a more objective measurement. It is sometimes contended, since relatively few farmers rent land, that observed rents are an unreliable indication of the rental rate. The reservation demand argument, however, states that all farmers participate in the renting market, including those that decide not to rent out or rent land.

In grazing areas, land use efficiency can also be judged by evidence of the intensity of land use, such as improved pastures, conservation of soil etc. Under a communal grazing system with free access, land rents are zero. Rents of arable land under the user-right system operating in traditional areas in Southern Africa, are expected to be smaller than when free transfers of properties are permitted. Risks involved in this market further reduce its efficiency. This market failure situation leads to a sub-optimum system. Clearly socio-economic factors also need to be considered in land use.

11. Land tax

The introduction of an agricultural land tax in South Africa is currently being debated. Although this issue is complex, a few observations will be made. Policy makers need to weigh up the arguments for and against such a tax. Arguments for such a tax are:

(i) A tax falling on land only and not on improvements is not a disincentive to production, as in the case of an income tax.
(ii) A tax on rents does not distort resource allocation.
(iii) Evasion and avoidance are not possible.
(iv) Farmers need not keep records on costs and incomes.
(v) It is a wealth tax.
(vi) The argument that such a tax will promote efficiency by bringing unutilized land into production is incorrect if farmers are profit maximizers (see item 2).

Arguments against a land tax are:

(i) The administration of a land tax is costly as all properties need to be appraised individually and regularly.
(ii) Agriculture requires profits for reinvestment. Consumers world wide have been beneficiaries from investments in agriculture in developed countries. In developing countries agricultural sectors are usually heavily taxed and this has contributed to food shortages in these countries (Schultz, 1978).
(iii) In practice it may be impossible to exclude all improvements from the tax.
(iv) If agriculture is subsidised and further taxed then it leads to administrative waste in operating such schemes. Effort should rather be directed towards eliminating current distortions and subsidies. The ability to extract significantly more taxes from agriculture, in the wake of subsidization of this sector in other exporting countries, is questioned.
(v) The tax is flat and not progressive. It does not depend upon the ability to pay. The tax is also the same in good and bad years, so the question of an exemption arises in a bad year.

Points (ii) to (iv) in arguments against do not just apply to land taxes. A high agricultural land tax will require more administration to ensure fairness. More pressure will then be on regular appraisals of properties. Alternative solutions are to:

(i) replace an income tax with a land tax or
(ii) to reduce income tax scales in agriculture and introduce a modest land tax. Any tax system should however be acceptable to all parties.

12. Optimum farm size

It is important that the optimum farm size be dictated by market forces and that state assistance or intervention (such as low real interest rates) not benefit large farmers. The optimum size of a farm will change over time as technologies, risks, prices of machinery and labour change. The introduction of machinery not only reduced the cost of food production but concomitantly increased the optimum size of commercial farms world wide. According to the survivor principal a tendency exists for the less efficient farmers to leave the industry while the more efficient farms survive. Evidence of economies of scale exist in large scale commercial agriculture, for instance Bullock

states that 20 per cent of farmers in the USA produce 80 per cent of the output and 100 per cent of the profit. The CAST Report (1983) for the USA showed that costs on large farms are covered at 54 per cent of parity (1910-14 = 100), on medium size farms at 77 per cent and at 132 per cent on small (less than $40 000) farms. In South Africa it has been stated that 27,5 per cent of the farming sector supplies 75 per cent of gross farm output. Consumers have benefited in the form of relatively lower food prices arising from technological adoption on large scale commercial farms. Management differs from farmer to farmer and a farm that is too large for one farmer in terms of his management potential may be too small for another. Risk and perception thereof which is a cost also differ with the size of farm.

Other economists support the small is beautiful notion in the sense that the smaller farm uses labour and land more intensively (Binswanger *et al*, 1986). Factors that affect farm sizes world wide are (Huang, 1973):

(i) resource endowment (population land ratio),
(ii) industrialization (off farm job opportunities) and
(iii) factor proportions determined by the ratio of the cost of machinery to labour.

In African countries, traditional farm sizes may further decline due to high population growth rates and limited off-farm employment. Under these conditions of population pressure on the land, the agricultural use of the land becomes of secondary importance and economies of scale loses its meaning.

Large commercial and small traditional farms fulfill different needs in society and their co-existence is expected in future. It is wrong if government policies lead to an increase in farm sizes. On the other hand, agriculture needs top managers, and severe artificial constraints on farm sizes may cause these people to leave agriculture.

13. Land efficiency and demand for food

The current population in South Africa, including TBVC countries, is 37,5 million. This population is projected to increase to 59,7 million in 2010, an approximate 60 per cent increase in population in the next 20 years. Expected urbanization further increases the demand for food while the population growth of low income groups is the highest. Food nutrition in South Africa can only be improved if *per capita* real incomes improve and if food prices do not increase relative to incomes of low income consumers. With current economic growth of less than 1 per cent (or even negative) and a population growth of 2,4 per cent, income *per capita* falls. At present an economic growth of marginally more than the population growth (+ 2,5 per cent) appears attainable (Van der Berg, 1990). Improving the nutritional status of society is probably the most important goal in farm policy. Within this context the efficient use of land plays an important role.

A restructuring in the demand is taking place because (a) population growth, (b) income elasticities, (c) urbanization and (d) *per capita* income increases/decreases differ for different sections of society.

There is world wide concern about the chronic food insecurity in sub Saharan African countries (Weber *et al*, 1988) and it is envisaged with a normalization of international relations that South Africa may play a more significant role in providing food to its neighbours in future.

The demand for food is price-inelastic, implying that marginal utility, as reflected by the price, increases significantly with a short supply. Urban consumers become restless if food prices increase as shown by the events following the recent bread price increase in Zambia.

14. Some concluding comments

With an expected population increase of 60 per cent during the next 20 years it is imperative that agricultural land use efficiency should remain a high priority. Developed countries tended to overrate agriculture through support programmes leading to surpluses while developing countries have tended to under invest in agriculture, leading to food shortages. With a new political dispensation it is important that South Africa should not make the latter mistake.

Political aspirations need to be met in order to move towards a politically stable society which is also a prerequisite for a market economy. Given the political aspirations and constraints land use efficiency should be a priority in both the traditional sector and commercial sector. In the traditional sector it was shown that land is underutilized due to the absence of a market for land and communal ownership of grazing rights. The commercial sector on the other hand does not need subsidies. The adoption of technologies and the retention of top management is however required in agriculture in order to ensure sufficient food for future generations at reasonable prices.

Note

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