

DOES FARM LAND HAVE A SCRAP VALUE?

by

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In 1995 an American agricultural economist, Prof. Arnold W. Oltmans, published an article entitled "Why Farmland Cannot, Will Not and Should Not Pay for Itself". The argument he advances in this article is that the big difference between the production value of land, which is calculated on repayment capacity, and the considerably higher market value of land, which is the actual price farmers pay, should be ascribed not to the overvaluing of farm prices but rather to an erroneous form of land purchase financing. The "error" that financial institutions are making, according to Oltmans, is that they want to finance the purchase of a farm like a form of hire-purchase. While hire-purchase is the instrument of choice for financing an item like a tractor, which depreciates in value, it is the wrong instrument for financing an item which appreciates in value.

A tractor that is depreciating eventually reaches the end of its life and is left to rust under a gum tree with an empty coffee tin over its exhaust, waiting to be cannibalised for parts. Land, in contrast, never wears out and its value never reaches scrap value. It should therefore be financed on the assumption that no final payment should ever be made, because then the production value and the market value would be the same. But is the professor correct in assuming that land could never reach the stage where it becomes an abandoned object under a gum tree with a coffee tin over the exhaust pipe?



Title deed

Land as fixed property is described in a title deed as a flat surface area. Consequently ownership does not vest in the land itself but instead attaches to a document which assigns certain rights to the holder of the document in respect of an immovable, specified flat surface. Financial institutions like documents of this kind, through which they can acquire certain rights that would enable them to finance the purchase of the land at an amortisable amount. The American professor may well have a strong argument when he speaks of the wrong form of financing in respect of land as fixed property.

But land as a natural resource is not a flat surface area which can be described in a title deed. In this capacity it is a cube which is not confined to a flat surface. Its dimensions extend some way into the air and include rainfall and temperatures. They also reach beneath the surface and include the different soil profiles with the organisms that live on and in them. The condition of land as a natural resource could well change considerably whereas land as fixed property will always remain a flat, specified area on a title deed. Contrary to the professor's argument, the value of farm land might well degenerate to scrap level, depending on the context in which it is measured.

Erosion

In its natural state land is continually exposed to erosion. The erosion of arable land involves the accelerated weathering of the topsoil through the physical forces of wind and water, possibly hastened by cultural practices. This artificial erosion arises when the energy that builds up in rainfall or wind is transmitted to the soil. Raindrops that fall on bare soil launch small particles of dust into the air while the heavier particles that remain behind become compacted. When the lighter particles descend to the compacted surface, they easily tend to flow away or be blown away, especially on slightly sloping surfaces. But living or dead plant matter on the soil absorbs the raindrops or wind energy and prevents the dust particles from being launched into the air or the heavier particles from becoming compacted.

In contrast, soil formation is a far slower process than soil degradation and soil losses can therefore be regarded as irreversible. Continual erosion therefore causes permanent damage to the topsoil which impairs its ecological production and hydrological function. The best way to counteract the continual degradation of soil is therefore to provide a permanent vegetal cover.

Losses

The international soil erosion model, known as the Universal Soil Loss Equation (USLE), was used by Dr Jay le Roux and his colleagues at the University of the Free State to measure rainfall erosion for South Africa. In quantitative terms the model estimates that South Africa's average loss of soil as a result of rainfall run-off alone amounts to 12.6 tons/ha/year. This is naturally considerably more than the average natural soil formation of 5 tons/ha/year and means that South Africa is losing soil at a net rate of 6 tons/ha/year, simply as a result of water erosion. In comparison with a country like Australia (4.1 tons/ha/year), South Africa is losing three times as much soil per year. Dr le Roux ascribes this big discrepancy to the aggressive cultural practices applied on South Africa's arable land.

As mentioned previously, soil loses its ecological production capacity and hydrological functions if the topsoil is lost. This secondary effect, determined on the basis of American research, is shown in Table 1.

TABLE 1: SECONDARY EFFECT OF SOIL LOSSES DUE TO WATER AND WIND EROSION

| Factors | Quantities lost Loss/ha (1 year) | Yield Loss | Quantities lost Loss/ha (10 year) |
|------------------------|---|-----------------------|--|
| Water runoff | 75 mm | 7% | 750 mm |
| Nitrogen (N) | 15 kg | 2.4% | 150 kg |
| Phosphorus (P) | 0.6 kg | | 6 kg |
| Potassium (K) | 123 kg | | 1230 kg |
| Soil depth | 1.4 cm | 0.3% | 14 cm |
| Organic matter | 2 ton | 0.2% | 20 ton |
| Water holding capacity | 0.1 mm | 0.1% | 1 mm |
| Soil biota | - | 0.1% | 0.0 |
| TOTAL | - | 10.1% | 6 ton |
| FINANCIAL LOSS | 0.6 ton/ha/year | R 1 212 | R 12 120 |

* Based on 17 tons/ha/year

** 10 tons of water erosion and 7 tons of wind erosion

*** Based on a maize yield of 6 tons/ha and a maize price of R2 000/ton

According to Table 1, a soil loss of 17 tons/ha/year means an accompanying loss of 75 mm of rainwater, 1.4 cm of soil depth and 2 tons of organic matter. The loss of N, P and K means a consequent crop loss of 2.4%. Along with the other losses, the soil loss ultimately results in a crop reduction of 10.1%. At an average maize yield of 6 tons/ha, this would amount to 0.6 tons and based on a maize price of R2 000/ton it would mean an annual financial loss of R1 212/ha.

In retrospect a crop farmer could cumulatively lose one full harvest out of every ten as a result of water and wind erosion. A further consequence is that the country could forfeit a full year's grain supplies every decade if farmers continue to apply tillage practices that promote water and wind erosion.

Conservation

The potential for protecting agricultural land by means of conservation practices has been demonstrated many a time in scientific reports. Even the simple expedient of creating an organic cover on the surface reduces water and wind erosion of the topsoil. At the same time strong permanent subterranean root systems also contribute to the protection of the rest of the soil profile against erosion and leaching.

Table 2 contains information on soil losses resulting from different tillage practices measured at Cedara in Kwazulu-Natal in 1983 after ten years of continuous maize production.

TABLE 2: AVERAGE ANNUAL SOIL LOSS AND MAIZE YIELD FOR DIFFERENT TILLAGE PRACTICES

| Treatment | Organic cover | Maize yield | Organic material | Average soil loss |
|---------------------|---------------|-------------|------------------|-------------------|
| | % | ton/ha | % | ton/ha/year |
| No till | 70% | 5.7 | 5.8% | 0.5 |
| Chisel | 30% | 6.6 | 4.6% | 1.6 |
| Mouldboard (Spring) | 0% | 6.7 | 5.2% | 7.1 |
| Mouldboard (Autumn) | 0% | 6.1 | 3.9% | 9.9 |
| Control (Rotavated) | 0% | - | 3.8% | 61.9 |

** Cedara water runoff trials in 1983 after 10 years of continuous maize production*

After ten years of the same tillage methods, the maize yield produced by no till was 5.7 tons/ha as against the 6.7 tons/ha with spring ploughing. However, the loss of topsoil in the same year as a result of no till was only 0.5 tons/ha as against the 7.1 tons/ha that resulted from ploughing. Although the yield was higher, over 1 ton of topsoil was lost for every 1 ton of maize produced. With chisel ploughing a yield of 6.6 tons/ha was obtained while the soil loss was restricted to 1.6 tons/ha. But there was only 4.6% organic material present in the soil whereas there was 5.8% present in the case of no till.

Compatibility

Since the first farms were allocated to free burghers in 1657, South African farmers have been associated with farming and the land but at the same time there have always been anomalies surrounding the general view of their role in respect of conservation practices. Farmers are generally characterised in terms of their close ties with nature, their marked awareness of weather patterns and their stewardship of the earth. At the same time conventional farming practices are held accountable globally for the alarming degradation of the land as a natural resource.

For many farmers economic targets and the aims of conservation farming cannot always be reconciled. The lines are largely blurred by the continual sharp increase in the prices of land as a fixed asset, for the

very reason that it is not seen as having a scrap value. On the other hand, the simultaneous degradation of the land as a natural resource is mainly invisible and in practice the financial implications are never really dealt with. Just as the farmer needs to understand the economic forces that determine land prices, he should also show an understanding of the natural forces that could destroy the sustainable value of his land.

Land as a natural resource is not an inexhaustible pantry for humankind and rainfall alone is often insufficient to solve all the financial problems. The land on which we are farming today has belonged to many people before us who are long dead and it will belong to many people who have yet to be born, and who will have to make a living from it. Something that will have to last for so long cannot simply be covered with a coffee tin and must be protected against degradation at all costs, so that its condition never degenerates to the point where it has no more than scrap value.

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