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Articles in the field of agricultural economics, suitable for publication in the journal, will be welcomed.

Articles should have a maximum length of 10 folio pages (including tables, graphs, etc.) typed in double spacing. Contributions, in the language preferred by the writer, should be submitted in triplicate to the Editor, c/o Department of Agricultural Economics and Marketing, Pretoria, and should reach him at least one month prior to date of publication.

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2001

# THE IMPACT OF A CHANGING ECONOMIC ENVIRONMENT ON RESOURCE USE IN AGRICULTURE

by

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## INTRODUCTION

The purpose of this paper is not to present new ideas, but rather to present a synthesis of a wide range of arguments drawn from the theories of government decision-making and economic development, and their interaction with agriculture. In our synthesis we attempt to view agricultural resource adjustments in terms of the relevant social and natural systems. Sometimes the economist seems to forget that he is primarily a social scientist.

Our presentation will concentrate on economic development as part of a process of secular growth. Our arguments will be cast in a framework of welfare economic theory, since this theory seems to be useful as an instrument for an analysis of this nature.

### 1. A model for efficient resource allocation

Current economic theory, specifically general equilibrium theory and welfare economics, provides a neat argument for determining the efficiency of resource allocation. Although arguments in general equilibrium theory and welfare economics are of a static nature, they provide a convenient starting point for an analysis of change through comparative-static analysis.

Welfare economics is a normative rather than descriptive (positive) field of study. The importance of assumptions in normative economics has already been treated comprehensively elsewhere (1, pp. 1 — 10) (2, p. 39). In general, the realism of assumptions is a necessary condition for realism of predictions arrived at through normative analysis. Therefore, a critical evaluation of assumptions seems to be a logical procedure in determining the reasons for the failure of such predictions to be realised in practice.

#### 1.1 Assumptions in the theory of free market economy

1.1.1 Assumptions about the market structure:- The free market economy is an economic system in which a

large number of participants are in atomistic and perfect competition. The actions of the participants are determined and co-ordinated by the market price system, in which all participants (i.e. consumers, producers and resource owners) have a right to formulate their decisions independently.

Interaction (bargaining) between decision-makers results in a specific equilibrium state with a unique (and optimal) set of prices. Such a general equilibrium under perfect competition implies that the resource allocation is Pareto-optimal, that is, no reallocation of resources in favour of one or more market participants can be made without causing at least one other participant to be disadvantaged (3, pp. 29 — 37) (4, pp. 85 — 87) (5, p. 42).

1.1.2 Assumptions about goals:- Participants in a free market economy may have different goals, depending on their level or sphere of decision making. Individual persons and family households strive towards utility maximisation, while the firm has as its goal profit maximisation<sup>1</sup>.

For society as a whole, the goal is maximisation of welfare. In this context "welfare" is a concept in which a person's individual, inter-personal and inter-temporal aims are combined, and related to his group associations.

1.1.3 Assumptions about certain constraints in the production and consumption spheres of the free market economy:- Each participating producer is limited to a smooth and convex production set (consider, for example the transformation curve). The nature and extent of the production possibilities set are, in the short run, limited by the level of available resources and by the state of technology. These are completely fixed for a given t $\hat{a}$ tonnement stage, that is, each gene-

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1. In the case of firms there are exceptions, such as satisficing or the maximisation of sales or market share. We believe, however, that these goals can be viewed as utility maximisation, where the goals of the family household have „contaminated” those of the firm.

ral equilibrium situation is based on a unique supply of resources and a unique state of technology.

Each participating consumer has a smooth and convex preference ordering. (Consider, for example, the arguments underlying the indifference curve). Within a given tâtonnement-stage, the preference ordering is completely constant.

Although they are fixed within a given tâtonnement stage, resources and products are completely mobile in a process of reallocation. (5, pp. 4 — 104) (6, pp. 22 — 25) (7, pp. 117 — 140).

### 1.2 Conditions for welfare maximisation in a free economy.

There are three sets of necessary, and one set of sufficient conditions for welfare maximisation. These are discussed in turn.

*1.2.1 Necessary conditions — the conditions for optimal resource allocation:*— The necessary conditions for optimal resource allocation consist of specifications for the production sphere, specifications for the consumption sphere, and specifications for optimality between the production and consumption spheres.

The optimality conditions for the production sphere are formulated as follows:

Suppose an implicit production function for the  $t$ -th firm (or sector)<sup>2</sup>

$$1. \quad f_t(Q_{t1}, \dots, Q_{ts}, \dots, Q_{tm}) = 0$$

where  $Q_{t1}, \dots, Q_{ts}$  = inputs

$Q_{ts+1}, \dots, Q_{tm}$  = products

Such a production function can be specified for each of the  $M$  firms (or sectors). The conditions for optimality are

$$2. \quad - \frac{\delta Q_{tk}}{\delta Q_{tj}} = \frac{\delta Q_{lk}}{\delta Q_{lj}} = \frac{P_j}{P_k}$$

where  $l, t = 1, \dots, M$  firms (or sectors)

$j, k = 1, \dots, m$  inputs and products

$P_j, P_k$  = prices of  $j$ -th and  $k$ -th input or product, respectively.

The conditions for optimality in the consumption sphere are formulated as follows:

Suppose an ordinal utility function for the  $i$ -th person

$$3. \quad U_i = U_i(Q_{i1}, \dots, Q_{im})$$

where  $Q_{im}$  = goods and services consumed, including own labour, and goods and services produced by the  $i$ -th person.

The conditions for optimality are

$$4. \quad - \frac{\delta Q_{ik}}{\delta Q_{ij}} = - \frac{\delta Q_{hk}}{\delta Q_{hj}} = \frac{P_j}{P_k}$$

where  $i, h = 1, \dots, n$  consumers

$j, k = 1, \dots, m$  goods and services.

The conditions for optimality between the production and consumption spheres are as follows:

$$5. \quad - \frac{\delta Q_{ik}}{\delta Q_{ij}} = - \frac{\delta Q_{ek}}{\delta Q_{ej}} = \frac{P_j}{P_k}$$

where  $i, l = 1, \dots, n$  consumers

$e = 1, \dots, M$  firms (or sectors)

$j, k = 1, \dots, m$  goods and services

Depending on the allocation of inputs and products to the production of different specific goods and services, and the allocation of these goods and services to different members of society, an economic system can be in any one of an infinite number of Pareto-optimal states — states which all conform to the necessary conditions for welfare maximisation as set out above<sup>3</sup> (8, pp. 203 — 253).

### 1.2.2 Sufficient conditions for welfare maximisation:

The sufficient conditions for welfare maximisation are contained in the concept of the social welfare function. This function represents the preference ordering of the government of a society, and contains a complex series of moral-ethical arguments which fall outside the scope of this paper (8, pp. 219-230). The social welfare function can be expressed as follows:

2. For a geometric exposition of this statement, consider the transformation curve in production economic analysis. Consider also the algorithm for solving a linear programming problem.

3. For a similar argument expressed geometrically, consider the contract curve and the grand utility possibility frontier as discussed by Bator (6).

$$6. \quad W = W(\beta, U_i, f_t(Q_j, Q_k))$$

where  $\beta$  = an endogenous variable component which includes, amongst other things, the moral-ethical value system of the decision-maker

$U_i$  = an exogenous variable representing individuals' utilities

$f_t(Q_j, Q_k)$  = an exogenous variable representing alternatives in the production sphere.

In a democratic society the nature and form of this function are determined by the aims and values of the society that participates in the decision-making process. Depending on the structure of the political process, this function can be expected to change with changes in the political power structure.

Figure 1 illustrates the interaction between the necessary and sufficient conditions for welfare maximisation in the simple case where the decision-maker is faced with only two alternative policies.

Finally, it should be noted that the process of welfare maximisation as set out in this section is automatic. Movement towards Pareto-optimal resource allocation and towards the "point of bliss" (see figure) will occur automatically if the assumptions of the system, as indicated previously, are met. Adjustments leading to maximum welfare will occur automatically for each change in the variables of the system, viz.  $\beta$ ,

$U_i$  and  $f_t(Q_j, Q_k)$  as set out in equation 6. Economic progress, for example, affects each of these variables. The adjustment process is directed via the system of real prices which originates from bargaining between market participants.

### 1.3 Variables relevant to a study of resource adjustment under economic development

Based on sections 1.2 and 1.3 above, it is possible to identify a set of variables which can serve as a starting point in a study of resource adjustment under conditions of economic development. These are summarised below, without discussion, in order to form the basis of later arguments.

1.3.1 *Market structure*, i.e. the assumption of atomistic and perfect competition.

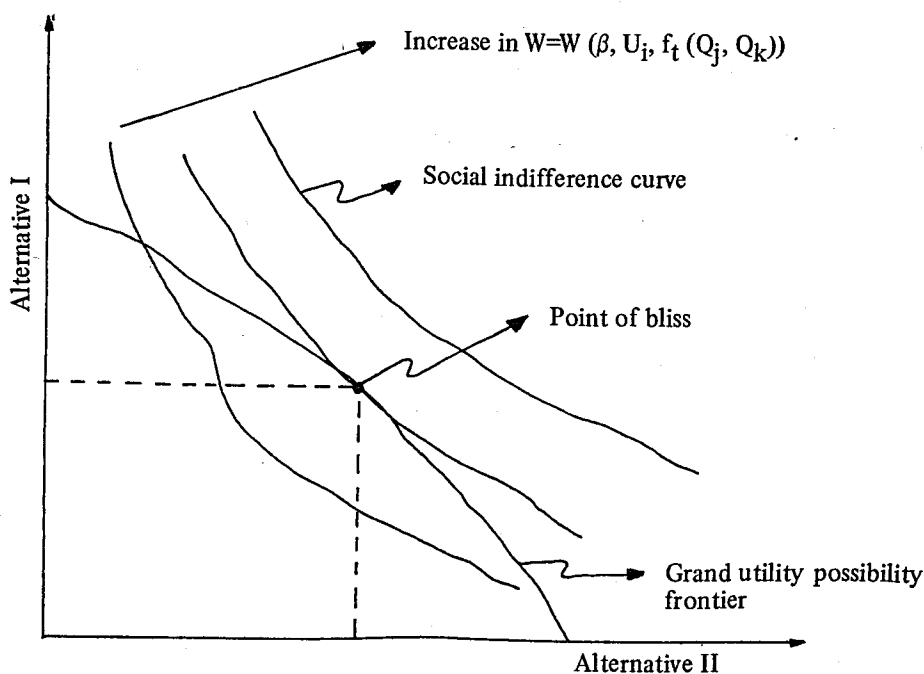
1.3.2 *Free price formation*, i.e. the assumption that prices are not externally determined, but that they originate as "La Grange multipliers" from bargaining.

1.3.3 *Independence of market participants' decisions*.

1.3.4 *Goals of market participants*, viz. the individual, the firm and government.

1.3.5 *Technology*.

1.3.6 *Resource supply*



Maximising welfare through interaction between the social indifference curve and the grand utility possibility curve representing all possible Pareto-optimal allocations in an economic system (6, pp. 24-30)

### 1.3.7 Consumers' preference ordering.

### 1.3.8 Mobility of resources

The importance of these variables can be inferred from the discussion in section 1.2; a more comprehensive treatment appears in works on this subject (5), (6), (7).

## 2. Economic development and changes in the economic environment of the agricultural sector

The terms economic development and economic growth are often used interchangeably, while they refer to distinctly different phenomena. Economic growth usually refers to changes in a single parameter, usually gross national product (GNP) or sometimes net national product. Economic development is a more comprehensive concept, which includes economic growth as only one of its parameters. What other parameters are considered relevant to economic development will depend on the aims of government.

Examples of parameters currently considered relevant in Western economies<sup>4</sup> are a fair distribution of income as expressed, for instance, by the Lorenz curve (9); a fair redistribution of resources; increased quality of life (consider, for example approaches to environmental planning in South Africa); economic stability and international bargaining power. Parameters of economic development differ between countries depending on their aims, but *economic growth* and *a fair distribution of income* are widely regarded as being important. For this reason, they will be concentrated on in this paper.

### 2.1 Economic development: the role of the agricultural sector

Theories of the development process of societies usually include a treatment of the interaction between agriculture and other sectors of the economy, as well as a description of the nature of its contribution. We do not intend to discuss these theories, since they have been treated comprehensively by a number of authors (11) (12) (13). Our concern is purely with the results of such analyses, some of which are summarised below.

Rostow, in his historical analysis of economic growth (14), identifies five stages of growth, viz. a traditional society, prerequisite for rapid growth, rapid growth, progress towards maturity and maturity. Important here is the fact the traditional society is principally agrarian, and that prerequisites for rapid growth

can only be reached after surplus resources have been removed from the agricultural sector. Theories of dualism, outlined by Lewis (15) and further developed by, among others, Ranis-Fei (16) and Jorgenson (17), and other theories of development as explained by Nichols (18) (19), Kuznets (20) and Johnston-Mellor (12) agree with respect to the role of agriculture in a country's economic development. Its most important contribution lies in the fact that labour, raw materials and foodstuffs are skimmed from the agricultural sector and transferred to non-agricultural sectors.

The question is how this transfer takes place. For example, is it a forced process in which labour, raw materials and foodstuffs are reallocated to other sectors on a percentage basis? A tentative answer lies in the fact that economic development of agriculture inevitably takes place within a wider economic system, in which the mechanism of the free market economy (i.e. the general equilibrium system) automatically reallocates resources in such a way as to attain a "new" Pareto-optimal equilibrium.

### 2.2 The mechanism of surplus transfer

Before the mechanism of surplus transfer is discussed, it is wise to consider Kuznets' comment on the matter (20, p. 104):

- "In considering the contribution of agriculture, or for that matter of any sector, to the economic growth of a country, we must first recognise an element of ambiguity. Since any sector is part of an interdependent system represented by the country's economy, what a sector does is not fully attributable or credited to it but is contingent upon what happens in the other sectors (and perhaps also outside the country)."

This view will be further considered in a later discussion on resource adjustment.

In a study comparing a Marx-Lenin model with a Mill-Marshall (capitalistic) model, Owen (21) reaches the conclusion that in both models the surplus is tapped. However, in the case of the Mill-Marshall model the surplus is obtained spontaneously, while the tapping is forced (for example through compulsory contributions to the state) in the case of the Marx-Lenin model. In the Mill-Marshall model of free market economy the surpluses are created through regular injections of new technology into a farming community in which farmers are in atomistic competition. Competition within the farming community forces farmers to adopt the new technology, since failure to do so puts them on a higher cost structure than other farmers, which in turn weakens their bargaining power. Especially in the later stages of economic development, the situation is aggravated by relatively inelastic demand functions for agricultural products,

4. See also Tinbergen (10, pp. 11 — 24).

where a given relative increase in supply causes a larger relative price drop. Again the individual farmer looks to improved technology to restore his previous income position which means that agriculture as a whole produces more but receives less income, unless alternative markets can be found and exploited. This process is characteristic of the agricultural sector during economic development, and necessarily leads to adjustments in resource allocation. In general, more will be used of those resources that benefit most from the technological innovation.

### 2.3 General implications of economic development: factors which affect the nature and extent of resource reallocation in agriculture

In sections 2.1 and 2.2, the specific position of agriculture under conditions of economic development was considered, and it was shown that agriculture is not only affected by development, it also contributes to such development. It is necessary, therefore, to consider the effects of economic development in a wider context, that is, in terms of its effect on the general equilibrium model as a whole rather than in terms of its effect on the agricultural sub-systems of the model.

The effects of economic development on the general equilibrium model can be direct or indirect. Direct effects are those that influence the variables of the model as a first-round effect. The effect of economic development on resource supplies or on the production function are examples. Indirect effects, on the other hand, influence the variables of the general equilibrium model as a second or third-round effect. Consider, for example, the potential effect of improved education and communication (the results of economic development) on consumers' preferences.

Johnson and Nielsen have postulated the indirect effects of economic development as follows (22, p. 179):

- "An underlying premise is that agricultural development must be viewed as a broader part of a 'process of modernization'. The society created by the modernization process is characterized not only by comparatively high and rising per capita income, but also by widespread literacy and access to education, considerable geographical and social mobility, an extensive network of transport and communications, a comparatively high degree of urbanization and widespread participation by members of society in modern economic processes characterized by extensive use of capital equipment and inanimate energy."

Considering only the direct effects of economic development would clearly be inadequate; indirect effects are equally important.

Economic development affects the general equilibrium model in all its dimensions as set out in sections 1.1, 1.2 and 1.3. The model is static-stable within the framework of its assumptions. As a result, changes in the model can be investigated by considering its assumptions as parameters in a study of economic development, which is the procedure followed in the remainder of this section.

**2.3.1 Market structure:-** It is well known that economic development leaves its mark on the market structure of an economy. Galbraith (23), for example, specifically mentions that oligopolistic market forms and monopolistic competition not only result from economic development, but are in fact instrumental in maintaining the development process. New technology is the fuel for continued secular growth, but its development is expensive and can be afforded only by relatively large firms. Furthermore, firms that command new technology enjoy a comparative advantage over firms that do not, which is another factor leading to expansion and conglomeration of firms.

A closely related process which, for the lack of a better term, we may call "socialising" of production, also deserves attention. As a result of the increasing capital requirements of larger firms there is a tendency among firms to become public companies in order to utilise the potential capital sources of the general public. The public generally views a share in such a company as a form of money (24) rather than as part-ownership of the company. As a result the decision-making power of the company is vested in its management, while the real owners of the company (the shareholders) limit their decisions to a choice between shares. Thus "socialising" of production is a process whereby decision-making power is divorced from ownership to such an extent that business decision-making tends to be confined to the internal company structure.

The tendency towards larger firms and the process of "socialising" of production will be specifically related to agriculture at a later stage.

**2.3.2 Free price formation:-** The assumption of free price formation deserves special attention when it is found that the assumption of atomistic competition is being violated. Price fixing is a logical result of a movement towards monopolistic competition. In a static situation the effects of price-fixing may not be far-reaching, but under inflationary conditions, for example, it may lead to collusion and "upward" competition (rather than "downward" competition) which tends to aggravate inflation. "Upward" competition refers to a tendency among firms to anticipate future cost increases by increasing their product prices, while "downward" competition refers to conventional competition. Firms or sectors which are not sufficiently organised to practise collusion are most affected



by this "galloping" inflation. In a situation where unequal competition exists, adjustments of this nature are not Pareto-relevant, that is some participants benefit while others are disadvantaged. As indicated before, reallocations of this nature are within the realm of the social welfare function, that is, they fall within the jurisdiction of the national decision-maker and should not be left to be resolved by the free market price system.

**2.3.3 Independence of market participants' decisions:-** The development process leads to an increasing interdependence among market participants (25). In general, development is possible only if man is prepared to concentrate his limited abilities on an increasingly narrowing specialised field of activity. Raw materials are obtained from an ever widening community of suppliers<sup>5</sup>. These tendencies increase the interdependence of decision-making, which in turn negates man's conception of his obvious dependence on natural resources. On the other hand, it promotes the notion that the source of his well-being (and adversity) is an abstract "they", that is, society as a whole or its representative (i.e. government).

Development superimposes on the tendency towards specialisation the tendency towards geographical concentration of the population and of consumption. The actions and interests of market participants overlap to an increasing extent, while externalities (as epitomised by pollution) and public goods become more important in public decision-making.

**2.3.4 Technology and resource supplies:-** It was shown in section 1.3.1 that technological change is the fuel for secular growth. It is sometimes said that resources are a function of technology, a view which contradicts the theories of the classical economists.

Technological change necessitates continual adjustments in production and consumption systems. Because technological change is a function of man's creative ability, it sometimes occurs in irregular discrete steps, benefitting some sectors of the economy more than others.

Over and above its direct effects on production and consumption systems, technology necessarily affects man's system of values. For example, as man's ability to control and manipulate nature increases, his views tend to become more secularised (26, pp. 30 — 31). The individual's reactions are analogous to those of a computer in that he reacts according to the programmes and data with which he is provided (27).

**2.3.5 Goals of the market participant:-** In a traditional society there is a close link between the family

unit and the production unit, in which case it can be expected that utility maximising is the prime objective. It can normally be expected that, as a result of the changes as discussed in 2.3.1 above, development will cause separation of the objectives of the firm from those of the individual.

It is commonly accepted that the goals of government are also influenced by economic development, since society's system of values are affected as discussed in 1.3.3 and 1.3.4 above. Tweeten discusses these changes by pointing out the differences between "farm fundamentalism" and "urban fundamentalism" (26, pp. 1 — 57). More specifically, such changes imply a shift in the social welfare function (and, therefore, in the social indifference curves) which may result in a general reallocation of resources. This point will later be discussed in more detail.

**2.3.6 Consumers' preference ordering:-** A development process may cause consumers' needs and preferences to change considerably, as proved by Engel's well-known law. In addition to this, consumption patterns are also influenced by the changed consumer environment created by development.

**2.3.7 Resource mobility:-** It is obvious that optimal resource allocation in a changed economic environment can only be achieved if the required resource adjustments can occur relatively rapidly.

Economic development is usually accompanied by a knowledge explosion and improved communication, which create favourable conditions for adjustment by expanding the decision environment of decision-makers at all levels. Increased specialisation, on the other hand, has an opposite effect. The "salvage value" of a highly specialised person may be relatively low in comparison with his present earnings. The same applies to specialised equipment. These factors are especially important in agriculture, and are discussed again in the next section.

### **3. Resource adjustment in agriculture during economic development**

The previous section concentrated on a broad discussion of the potential effects of certain aspects of economic development on general equilibrium in an economy. In this section we turn to adjustments that apply specifically to the agricultural sector.

#### **3.1 The effect of changes in market structure on resource use in agriculture**

Changes in market structure are now considered in a wider sense than before, so as to include aspects of price formation and decision-making.

5. Vertical integration represents an attempt to alleviate this problem.

The relatively small farm unit stands in contrast to the general tendency towards amalgamation and conglomeration found today in the non-agricultural sectors. According to Breimyer, the initial reason for this is to be found in agriculture's historical dependence on land. He puts it as follows (28, p. 29):

- "Primary agriculture's historical reliance on a fixed, immovable, extensive resource, land, was a mighty force leading to the small family unit. Furthermore, the built-in limitation on total farm output helped to preserve land values and thereby protected against unsettling influences which would challenge that order."

He adds that the ability of agricultural firms to grow in a way that is analogous to the growth of non-agricultural firms is directly associated with their ability to shed their dependence on land resources.

Technological progress provides the farmer with an opportunity to shed this dependence. More man-made resources are used and the relative importance of land as a factor of production declines (29, pp. 125 — 145). The tendency of farm units to expand is well-known today. As well-known, however, is the fact that landownership generally contains a strongly emotional element. It often seems as if the view exists that being a farmer is synonymous with owning agricultural land. This attachment to the land even goes further in the form of a belief in a rural culture (Tweeten's "farm fundamentalism") and is sometimes reflected in government policy aimed at supporting it (30). Thus, for entrepreneurs landownership as such may represent an objective next to profit maximising, a fact which is often disregarded when farm industry surveys take into consideration only net farm income. In an economy where all land resources are already utilised farms can only expand if some farmers are prepared to disengage themselves from farming, or if some farmers are prepared to sacrifice their independence by pooling their resources in either a co-operative society or a company.

It is clear that there are forces *pro* and *con* the expansion of farm units, but on balance they cause amalgamation and conglomeration in the agricultural sector to proceed at a slower rate than is the case with non-agricultural firms. Because this causes unequal intersectoral bargaining power, it can lead to non-Pareto-relevant reallocations in a dynamic economy, where first individual farmers and later society as a whole are adversely affected. For example, it is theoretically possible that during continued galloping inflation agricultural output will decline as a result of cost increases unless agricultural product prices are adjusted through purposeful government intervention. The background to this statement has already been discussed.

With respect to the future it can be hypothesised that, in the long run, the current tendency towards

larger farm units will accelerate and that it will be accompanied by a separation between ownership and management of farm firms, as is already the case in non-agricultural sectors. These possible changes are closely related to changes in society's system of values.

### 3.2 *Economic development and interdependence between agriculture and other sectors*

Economic development necessarily causes agriculture to be more dependent on other sectors of the economy (25). The elasticity of supply of agricultural products, for example, depends among other things on the elasticity of supply of agricultural inputs which are produced in other sectors (31, pp. 118 — 123). This form of interdependence is well-known, but the more subtle forms are often not recognised. Two main categories can be distinguished, viz. externalities and public goods.

Agricultural development results in intensive production, which in some cases causes pollution (32) (33). In such instances there is a need for a greater degree of overall planning. An example of such an interdependency in South Africa is salination of irrigation water in certain irrigation schemes, a problem which has caused considerable concern among farmers and researchers alike. With the pollution problem in mind (34) some countries are undertaking research into the effects of lowering fertilizer application rates nationally.

An example of the "public goods" category of interdependence between agriculture and other sectors is the case where the preservation of agricultural land around cities is considered necessary as "green belts" or for other reasons of a social nature. In this case the importance of agricultural land changes from its private production-oriented use to a social-oriented use with side-benefits for society, i.e. public goods. The "products" of such a farm are not only those that are physically produced; they also include certain intangibles which are valued by society through the mechanism of revealed preference. A final conclusion about the nature of this need and about the proper course of action has not been reached, as illustrated by the current controversy over farms in Paarl and by concern expressed by individuals and organisations about Constantia. It is hoped, however, that the future will see greater clarity over the issues involved, since it can be expected that such cases will become more common as population density increases and incomes rise.

### 3.3 *The effect of technological change*

As was said before, technological change represents the fuel for growth in the agricultural sector. Generally speaking, the intra- and inter-sectoral distribution of its effects is not proportionate, a phenomenon that strains the ability of agriculture to adjust.

Since the elasticity of supply of agricultural land is low (it approaches zero) and since technological innovations affect capital resources most, pressure to leave agriculture is exerted on labour and entrepreneurial resources (31, pp. 167 — 210). Improved technology reduces the marginal value product of human resources in agriculture and so creates a surplus of labour in this sector.

Until now technological progress has tended to be more rapid in horticulture and crop production than in animal production. As indicated in terms of the general equilibrium model, this has the natural result that more resources are directed towards horticultural and crop production, while resources employed in animal production remain constant or are reduced. South African studies of these changes support this view (35).

Technological progress with respect to consumer goods also has had a marked effect on the characteristics of products required for consumption and on production possibilities in general. It is sufficient to mention here the potential effect of improved transport and processing facilities, and the effect of the development of new products such as margarine, man-made fibres, cream and meat.

### *3.4 Farmers's goals specifically, and those of the farming community in general*

It is our view that the process of economic development will cause profit maximising to replace utility maximising as an objective. In general, larger farm units benefit more from technological progress than smaller units; the larger unit requires more capital, and capital requirement will, in general, exert pressure on the family farm unit. A greater tendency among farm firms to become public companies is expected, since such a form of enterprise enjoys a comparative advantage over others. However, this process will probably be retarded by the government's approach to the matter because they may have as one objective the preservation of a rural community.

On the other hand it is true that, in a democratic system, public decisions are a function of the values of society. Farm fundamentalism, as characterised by a respect for the powers of God and nature, recognition of the individual and a strong sense of individualism, stands in contrast to urban fundamentalism. The city-dweller is impressed by the creations of man because he is in daily contact with it, while nature and its forces are, for him, an abstract notion. Economic development leads to urbanisation, and urbanisation will cause changes in the values of society. This form of change is synonymous with a shift in the social welfare function, and will necessarily lead to resource reallocation.

### *3.5 Concluding remarks with respect to resource mobility.*

In his epic work "War and Peace", Tolstoy reaches the conclusion that the actions of princes and generals are in fact in integral of the actions of the "little people" whom they govern: governors are governed. A study of welfare economics leads to the same conclusion in the sense that preconditions are determined by the social processes.

One of the preconditions for increasing efficiency in agriculture is increasing adaptability, in other words a high degree of resource mobility. In the case of agriculture increasing adaptability means an increased mobility of its human resources, because technology attracts capital and land can not be moved.

This natural process is there for legislators to be observed, in order that they may render it as painless as possible for all parties involved. Many farmers have a low personal "salvage value", which causes them to remain in farming while they suffer a low-income problem. Much has been written about ways and means of raising the opportunity cost of farmers (31) (26).

### **SUMMARY**

- During economic development, agriculture becomes more closely involved with a country's economic system as a whole, as more and more man-made resources are used in farming.
- Over and above the direct effects of economic development, some indirect effects are relevant. These are, for example, strain on the family farm as a viable form of business organisation, and changes in the values of society as a whole. Such changes may mean significant changes in the structure and organisation of agriculture.
- The fact that the agricultural sector is part of a social system does not mean that its position in the ecosystem can be ignored.
- Government decision-makers will have to keep in mind all the effects of a policy of economic growth. Such a policy will necessarily cause a need for transfer of human resources from agriculture. Price policy can at its best be only a temporary measure to alleviate the low-income problem resulting from growth. Price as a measure in cost accounting will have to be distinguished from its role as a cybernetic instrument.

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