

AGRICULTURE AS A DRIVING FORCE OF ECONOMIC DEVELOPMENT: SUGGESTIONS FOR AGRICULTURAL DEVELOPMENT POLICY IN SOUTHERN AFRICA

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The purpose of the paper is to explain the process by which modernisation of the agricultural sector by introducing new production technology into the sector serves as driving force of general economic development, with the social rate of return on these investments being very high, while the benefits of the development will be widespread in the economy, and generally in favour of the poor. Furthermore policies are discussed with the aim of increasing productivity and per capita income of rural people in Southern Africa.

LANDBOU AS 'N DRYFKRAG VAN EKONOMIESE ONTWIKKELING: VOORSTELLE VIR LANDBOU-ONTWIKKELINGSBELEID IN SUIDER-AFRIKA

Die doel is om die proses te verduidelik waardeur die modernisering van die landbousektor deur die inbring van nuwe produksietegnologie dien as 'n dryfkrag van algemene ekonomiese ontwikkeling met gepaardgaande hoë opbrengskoerse op beleggings in die landbou terwyl die voordele van die ontwikkeling ten gunste van die armes versprei word. Verder word beleide bespreek met die oog daarop om die produktiwiteit en per kapita inkomste van landelike mense in Suid-Afrika te verhoog.

1 INTRODUCTION

The Agricultural Economics Association of South Africa's 36th Annual Conference is an historic event because it is being held in Swakopmund with AGRECONA (Association of Agricultural Economists of Namibia) as host organisation. The theme of the conference is "Agriculture's economic role in Southern Africa in the new millennium".

The Southern African region refers to the SADC countries: Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. It is estimated that 140,2 million people live in the Southern African region, of whom the majority live in rural areas (Van

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Rooyen, 1997:182-183). In most of the countries in the region the rural population is poor, the resource base is relatively poor or underdeveloped and climatic conditions relatively unstable (African Development Bank in Van Rooyen, 1997:182; Eicher & Baker, 1992:3-8). Southern Africa faces enormous economic challenges, such as poverty alleviation, food security, job creation, increased farm productivity, sustainable use of natural resources, land reform and human capital development (Van Rooyen, 1997:181). During an Interconference Symposium of the International Association of Agricultural Economists (IAAE) held by AEASA at Badplaas from 10-16 August, 1998, most of these challenges were addressed by the conference theme of "Challenges facing agriculture in Southern Africa".

However, at the Badplaas conference I realised how important it is that we again reflect on the issues of promoting agricultural growth and food security in the Southern African region (Von Braun, Msuya & Wolf, 1998:1). We are privileged to have with us Dr. Douglas Hedley of Canada, current president of the IAAE as well as other invited speakers from Swaziland, Namibia, Kenya, South Africa and the United Kingdom to elucidate the economic role of agriculture from regional, national and international viewpoints.

Firstly, I will focus on agriculture as a driving force for economic development and then make suggestions for agricultural development policy in the region. In the argument about the economic role of agriculture, I will concentrate on the process as well as the economic forces through which agriculture achieves the economic development. I found it illuminating that Schuh (1997) found it necessary to describe these basic processes in detail recently. I judged that a repeat of this well-known but important economic theory would serve as a suitable foundation for the conference theme and debate. The motivation for this decision is that agriculture is in danger of being removed from the agendas of the bilateral and multilateral development agencies. This decline in the importance of agriculture on development agendas is due to misperceptions about the process through which agriculture contributes to economic development as well as a lack of recognition regarding how powerful a force it can be, especially in the early stages of economic development. It seems as if the realisation of the positive income distribution features and the approach of economic development by modernising agriculture are lacking.

2. AGRICULTURE AS DRIVING FORCE OF ECONOMIC DEVELOPMENT

This section starts with a discussion of the seemingly conventional viewpoint on agriculture in the development process. Next the way modernising agriculture can make a positive contribution to broader economic development is discussed. Then the role of food as a wage good is discussed, as well as how modernising the agricultural sector can contribute to assist a country towards becoming more competitive in the international economy in general. In the last part the opportunity countries have if they take steps to utilise their comparative advantage in favour of agriculture is discussed.

2.1 The conventional view of the role of agriculture in economic development

The dominating viewpoint regarding the role of agriculture in economic development seems to be based on an incorrect interpretation of two important facts regarding the agricultural sector as economic development proceeds. The first fact is that agriculture's contribution to a country's gross national product (GDP) declines as per capita income increases (Seitz, Nelson & Halcrow, 1994:11). The second fact is that agriculture's share of the total labour force declines under the same circumstances.

From these unavoidable results of economic growth, policy makers and developers seemingly come to the conclusion that the way to promote economic development is to concentrate development resources directly on the expanding sectors rather than on the agricultural sector, where most of the country's resources are located. This approach is based on the implications of the consequences of economic development instead of on an understanding of underlying economic and technological forces that are at work. Agriculture declines both as a share of the GDP and of the total labour force as a result of certain basic features of the food sector.

Food tends to have a low-income elasticity of demand, which means that as per capita income rises, the demand for food does not increase as rapidly as the demand for other goods and services. This low-income elasticity is rooted in Engel's law, the empirical fact that when per capita income increases, consumers spend an ever-smaller part of their budgets on food.

The above considerations mean that, under reasonably general conditions, food and agriculture as a sector of the economy will decline as the economy grows and develops. This process will speed up if new technology which

increases agricultural productivity is introduced. The increase in productivity will contribute to the release of capital and labour from the agricultural sector as output expands against a demand that is rather unresponsive to increases in per capita incomes.

None of the above arguments mean that the food and agricultural sector should be neglected as a means of promoting economic development. On the contrary, the next section will explain how the food and agricultural sector can play a meaningful role in promoting economic development.

2.2 How the food and agricultural sector can contribute towards general economic development

The food and agricultural sector can contribute to general economic development in a positive way if the development of the sector is based on the development of a research and extension capacity for developing and delivering new production technology for the sector and if the economic policies are such that the adoption of new technology is promoted.

To explain this process, Schuh (1997:4-8) uses, on the one hand, the modernisation of the subsistence or staple food sector, and on the other hand the modernisation of the export or import-competing sector. The export or import-competing sectors jointly are often called the tradeable sectors.

The subsistence or staple food sector refers to the group of products comprising consumers' most important food items. In most countries it includes products such as rice, maize, cassava, potatoes and other tubers, edible beans, sorghum and millets. These products are usually called necessities, as they are essential to providing the caloric intake of the consumer, especially the low-income consumer. An important characteristic of the conditions of demand for these products is that not only is the demand for them relatively unresponsive to increases in per capita income but the quantity demanded is also relatively unresponsive to changes in their price. These products tend to be relatively important in the budget of low-income people.

Consider what happens when new yield-increasing production technology is introduced for producing these commodities. This technological change will increase the supply of these products; a process that will continue as the adoption of the new techniques spread among more and more farmers. Due to price unresponsiveness to changes in supply the price of the product will tend to decline. Low-income countries do not usually trade these products

internationally, with the result that the price is determined mainly by domestic supply and demand conditions.

The above decline in price, though detrimental to farmers who have not introduced the technology, has a positive effect on the economy as a whole. A decline in price of an important staple product leads to an increase in the real income of consumers using that staple food. Though the increase in income for each consumer is relatively small, it can involve substantial amounts when the total economy is taken into account. This is one of the reasons why the social rate of return on investments is so high for research leading to new production technologies (Thirtle, Townsend, Amadi, Lusigi & Van Zyl, 1998:6).

Modernising the production of a staple product has an additional important feature. The benefits of the new technology tend to be distributed disproportionately in favour of the poor. The reason for this is that poor consumers tend to spend a larger part of their budgets on food than middle or upper income consumers.

This distribution of the benefits of economic development in favour of the poor is a very important feature of the development of agriculture by introducing new production technology. In fact no other sector in the economy can be identified with this characteristic, or for whom the benefits are distributed so widely throughout the economy. To gain insight in this fact, consider the distribution of the benefits of developing a motor industry or other goods and services, of which the demand expands more rapidly as the per capita income increases. Relatively few people will benefit and those that do will tend to be the middle or top income groups.

These are not the only benefits of modernising the subsistence or staple food sector. The extensive increase in per capita income will generate an increase in the demand for goods and services whose demand increases in a relative manner as those incomes rise. This increase in per capita income will induce expansion of the non-farm sector. Therefore the benefits of modernising agriculture will spread to the rest of the economy in consecutive waves (Van Zyl, Nel & Groenewald, 1988:2; Van Rooyen, 1990:5; Van Rooyen & Machethe, 1991:175-177).

Consider production technology in the tradable sectors. This sector comprises two components : the export sectors and the sectors competing with imports. In the above cases the contributions of modernising these sectors differ mainly as a result of the demand for these products differing substantially from the

demand for staple products. As the tradable sectors form part of the international economy, increased supply has little, if any effect on the price of the product.

Though the benefits of introducing new production technologies differ slightly in these sectors, modernising these sectors can also be powerful sources of general development. In the case of exportable products, farmers, and not domestic consumers, receive the greatest benefit of the new technology. The prices they will receive will not decline, but they will experience an increase in production due to the increased productivity made possible by the new technology.

Though the factors mentioned above will benefit the agricultural sector, it is not the end of the process. The increased productivity will enable producers to be more competitive on international markets and an increase in supply due to the increase in productivity will increase the volume of exports. The net effect will be an increase in foreign exchange earnings. The increased earnings from foreign exchange can be used to service foreign debt or to finance a higher rate of economic growth. If used to finance the growth rate, the benefits will once again be distributed widely throughout the economy, though not as widely as would be the case with staple food. But the job opportunities created will have wide spillover effects in the economy.

The effects of introducing new production technologies for import-competing products are basically the same with regard to foreign exchange. Compared to an increase in foreign exchange earnings, the savings in this case will be due to a decline in imports. These savings can be used to service foreign debt or to finance a higher economic growth rate in the same way as an increase in foreign exchange earnings from increased exports.

The conclusion is thus that the development of agriculture by introducing new production technologies can be a powerful force for economic development. The benefits would be felt throughout the economy and usually in favour of lower-income groups. Favouring low-income groups with development instruments is usually a general and appropriate goal of policy makers.

Investing in agricultural research and extension to develop and distribute new production technologies for farmers has a high social rate of return. In actual fact extensive research has shown that these rates of return are not only on the high side but that in some cases it is more than 100 percent (Thirtle *et al.*, 1998:6 and Khatri, Schimmelpennig, Thirtle & Van Zyl, 1996:287). These are

wonderful rates of return, especially as developing countries can borrow from the World Bank and development agencies at rates below 10 percent (Sarbib, Binswanger & Van den Brink, 1998).

2.3 Food as a wage good

The allocation of development resources to modernising agriculture, particularly the subsistence sector, also has other general positive benefits in the economy. Workers tend to spend a large proportion of their budgets on food. Therefore a decline in food prices will lead to an increase in the real wage rate of workers as long as the nominal wage remains constant.

According to Schuh (1997:8) the consequences should be considered within the context of the economy's need to remain competitive in the international arena. Two main factors play significant roles in the establishment of international competitiveness: the real exchange rate of the country's currency and the cost of labour determined by both the wage rate and labour productivity.

Firstly, consider the cost of labour. It can be approached from two different perspectives. First, with food prices declining the nominal wage can decline with no reduction in the real wage. This will enable the country to be more competitive in the international economy. The effects of this can be widespread in the economy with resulting increases in foreign exchange earnings and a contribution towards financing a higher growth rate.

Second, the nominal wage rate can remain constant, causing the real wage in the domestic economy to increase. In this case the workers benefit from a higher real wage instead of increased employment. The role of food as wage good is therefore an important additional means in which modernising agriculture by introducing new technology in the sector can contribute to the general development of the economy as a whole.

How the benefits from the modernisation of agriculture are distributed under these two circumstances will be very different. Which of the two scenarios is realised, or whether it is some combination of the two, will depend on the competitiveness of the economy as a whole and the competitiveness of the labour markets themselves.

2.4 Opportunities created by modernising agriculture

Developing countries have an important opportunity to earn foreign exchange in the future, should they be willing to modernise agriculture. The present situation is that the comparative advantage in the international economy shifts, with the benefit for agriculture shifting to developed agriculture and the benefit for the manufacturing sector shifting to the developing countries (Schuh, 1995:20).

The reason for this shift is that the developed countries have the installed capacity for agricultural research and can therefore continue producing technology for the agricultural sector in a steady stream. Most of the developing countries, on the other hand, lack this capacity. To the advantage of the developing countries is that technology for the manufacturing sector can be transferred readily to their economies, compared to the agricultural technology. Manufacturing technologies are seldom location specific, as is the case with biological improvements, which are important elements of modern agricultural technologies. In addition, developing countries have increased their general education levels, enabling them to introduce new technologies from overseas for their labour intensive manufacturing sectors.

3 SUGGESTIONS FOR AGRICULTURAL DEVELOPMENT POLICIES IN SOUTHERN AFRICA

Agriculture and rural areas in most countries in the region have been neglected severely by policy makers (Spencer & Badiane, 1995:62, Eicher & Baker, 1992:35-54, Binswanger, 1994:166-167, Jaeger & Humphreys, 1988:1043 and Schuh, 1986a:1-3.)

Governments intervened in their economies on a vast scale; subsidies were focused mainly on physical capital and on urban workers and consumers and there was significant underinvestment in human capital for agriculture and rural development in terms of the capacity to produce new production technology, modern institutional arrangements, nutrition and health and the education and training of the rural population (compare Binswanger, 1994:165-173 and Eicher & Baker, 1992:54). With such serious discrimination against agriculture, only partly and ineffectively offset by subsidised credit and other measures, it is not surprising that agriculture has performed as poorly as it has (Anderson, 1996:204 and Kassier & Groenewald, 1992:95).

Gradually most of these discriminating policies against agriculture were relaxed and economic policies became more open (Delgado, 1995; Vink,

1993:155; Groenewald, 1991:193-196 and Schuh, 1991:381). Limited but significant attempts to build the capacity for agricultural research in the region and a greater dependence on market forces to allocate resources have been made (Anderson, 1996:206 and Binswanger & Pingali, 1986:381). The agricultural sector has reacted accordingly, with productivity becoming increasingly important as a source of production growth (Delgado, 1995, Van Braun *et al.*, 1998:4, Petit & Knaegy, 1995:57-58, Spencer & Bandiane, 1995:63 and Mellor, 1989:4-8).

Policies in the region still leave much to be desired (Van Rooyen, 1997:190-194, Backeberg, 1996:160-167, Van Rooyen, Ngqangweni & Frost, 1996:300 and Van Zyl & Kirsten, 1992:180-183). The tendency of the governments to intervene in unsuitable ways is still general practice in the region; national agricultural research systems are still vastly inadequate measured by international standards and the underinvestment in human resources for agriculture is still huge by just about any standards (Sarbib *et al.*, 1998). The important point is, however, that both the theory and gathered empirical evidence indicates the direction to be taken by policies, and important strides have been taken to move them in that direction (Sarbib *et al.*, 1998).

A new international order is developing (Coetzee, 1995:152, Tweeten, Zulauf & Rask, 1990:27 and Schuh, 1986b:84-86). The international economy tends to a more even distribution of political and economic power. This implies, among other things, that overseas development aid will probably continue at present low levels and that developing countries will have to pull themselves up by their own economic bootstraps (compare Ruttan, 1998:572-573). The experiences of newly industrialised countries such as Brazil and Mexico illustrate that it is possible if economic policies encourage effectiveness and offer incentives and if the proper investments are made in human capital.

The purpose of this section is to provide an overview of policies that can promote a more rapid rate of agricultural development in the region and of ways agricultural economists can contribute to improving the futures of people in the rural areas. The challenge to agricultural economists is to identify the balance between the proper role of the governments and the proper role of the markets with regard to policies for the promotion of agricultural development (Johnson, 1995:16-19). Furthermore, it should be realised that the correct policy for one stage of development is not necessarily the best for another stage of development.

The suggestions for agricultural development policy which are given are based on Schuh & Brandáo's (1992:891-906) policy suggestions for Latin

America, with supporting evidence from research in the Southern African region. Attention was given to the following policies: prices, factor markets, human capital, physical infrastructure, income distribution, the external terms of trade, population policy and international issues.

3.1 Price and incentive policies

The objective of price and incentive policies should be that domestic prices should, as far as it is possible, reflect border price opportunity costs. These prices include modern (purchased) inputs as well as products. Border prices are the best incentive to increase effectiveness and to encourage adjustments within the continuously changing conditions of the international economy. The exception occurs when dumping by other countries causes lower international prices than usual. Under these circumstances a certain degree of protection of the domestic industry is appropriate, though it would depend mainly on whether the dumping is expected to continue for a considerable time as well as on a proper evaluation of the cost and advantages of the dumping by other countries for the domestic economy. If such protection of the domestic economy is appropriate, the goal should be to equalise the domestic terms of trade to that of the international markets.

Instability in product markets is often an issue in agricultural policy and governments often intervene due to a desire to maintain stability. Stability would probably be achieved most effectively and efficiently by policies shaping the economic environment of the sector, rather than as a result of intervention in the product markets. Monetary stability should be the highest priority goal. Free trade is also important so that the international economy can contribute to bearing the burden of adjustments. If the governments do not intervene in the product markets, an environment will be created within which the private sector will carry stocks at sufficient levels to level out price fluctuations. Furthermore an effective credit system will supply the means by which private economic agents can level out their income and consumption flow over time. An important reason why governments become anxious about instability is lack of risk markets by means of which private agents can insure against risk. Governments must be advised to assist in developing their risk markets rather than intervening in the markets. The establishment of futures markets serves as an important example (compare Van der Vyver, 1994:50).

3.2 Factor market policies

The second set of policies involves those aimed at the factor markets, in particular land, labour and capital or credit. Interventions in these markets by the governments is also common in the region. The goal of the policy makers in this case should be that the prices of the production factors reflect their shadow prices or scarcity values. A wide range of governmental policies often prevents this happening.

Regarding the labour market, longer term policy measures aimed at improving education in the rural areas could offer a more permanent solution for the problems of poverty and malnutrition, as education shifts both the labour supply to the left (lower population growth) and shifts the demand for labour to the right by increasing productivity (Nieuwoudt, 1987:4 and Anderson, 1996:205). These shifts will increase real wages. Education also improves job mobility.

Given the general need to transfer labour out of agriculture as development progresses, the governments should have generally positive adjustment policies for the agricultural labour force. Broad-based formal schooling should form part of such policies. In addition training programmes, labour market information systems and relocation subsidies should facilitate the adjustment process continuously.

Regarding land markets, the aim should be to reduce or eliminate interventions by governments (Nieuwoudt, 1987:3 and Nieuwoudt, 1990:210-211). Such policies include size limitations on land and regulation of tenure share arrangements. High transaction costs and uncertain property rights hinder the establishment of active land rental markets (Lyne, Thompson & Ortmann, 1996:15-17 and Moor & Nieuwoudt, 1995:288). The redistribution of land should take place in conjunction with proper price policy; the introduction of new production technologies; the training and retraining of the labour force and the provision of sufficient credit supplies (compare Nieuwoudt, 1993:96-100; Van Rooyen, Coetzee & Swart, 1993:129; Kirsten, Van Rooyen & Ngqangweni, 1996:218-223 and Metzger & Van Zyl, 1992:508).

The goal of credit policy should be to develop true financial intermediaries (compare Duncan, Boehlje & Lins, 1995:4-7 and Groenewald, 1993:125-127). Credit policy should however form part of a broad capital market policy. Capital market instruments, which allow economic agents to participate in capital markets in a wide variety of ways, are important. Similarly, instruments that generate savings at socially optimal rates are essential, both

for agriculture and the rest of the economy. Subsidised credit should be avoided (Coetzee, Kirsten & Van Zyl, 1993:193). If it is desirable to subsidise small producers, it should be done in a transparent manner, such as grants rather than implicit subsidies. The goal should be to have capital (and credit) markets that draw resources to agriculture (or keep resources in agriculture) and that channel these resources to their best uses, including long term investments. The role of the government in the credit sector should be to supply stable monetary conditions, an adequate information system, as well as the legal and institutional arrangements necessary to enable the markets to operate effectively.

3.3 Investment in human capital

Policies should be in place to promote investment in human capital (Nieuwoudt, 1986:3 and Longworth, 1992:20). The need to strengthen countries' research capacities should be high on the list of priorities (Anderson, 1996:206). New production technology is truly an engine for economic growth, while most countries in the region underinvest in this resource. Given the location specific nature of agricultural technology, the aim of policy makers should be to have an effective research institution in each of the important ecological zones of their countries. In addition, a suitable framework should be established to encourage the private sector to invest in new production technologies. For this patent rights and other means of capturing the return on their investments are required. In addition, governments should ensure that their research systems capitalise on acquiring and adapting knowledge generated overseas. Effective extension systems are a very important complement to an effective domestic research capability.

There is a real need for adequate research capacity in the social sciences (economics, political science, anthropology and sociology). This capacity is needed to evaluate economic policies, to draft new economic policies, to design and redesign new institutional arrangements and to supply decision-makers, both public and private, with information. The "technological output" of the social sciences is, among other things, new institutional arrangements. In general most countries in the region underinvest in the design and implementation of new institutional arrangements (Lyne, 1996:189 and Von Braun *et al.*, 1998:2).

3.4 Investment in physical infrastructure

There is a chronic tendency in the region to underinvest in rural infrastructure including roads from farms to the markets, through routes, railways, schools,

health clinics, rural electrification, rural telephone services, harbours and port facilities. An adequate rural infrastructure is essential for a modern agricultural sector.

3.5 Improvement of the income distribution

Countries can improve their income distribution by investing in the human capital of the disadvantaged without sacrificing economic growth. Import-substituting industrialisation policies have contributed considerably to distorting the income distribution in the region.

Countries' income distribution can be improved by investing in new production technologies for agriculture, especially for staple foods. Consumers are the final beneficiaries of these new production technologies and they benefit in a progressive manner because low-income consumers spend a larger proportion of their budgets on food. The decline in food prices made possible by the production and diffusion of new production technology is also beneficial to these groups to a relative degree.

3.6 Decline in external terms of trade

Chronic and stubborn declines in external terms of trade are important characteristics of the international economy with which most of the countries in the region must now compete. Policy makers are challenged by such declines when they occur, because the country's balance of payment and its ability to pay off overseas debt are impaired. Such declines could also cause serious adjustment problems for the domestic economy. At the same time, a decline in the external terms of trade can have substantial benefits for domestic consumers as well as for users of important raw materials.

To the degree to which the long term shifts in the external terms of trade is a reflection of the differential growth rates in sectoral productivity in the external economy, one way of dealing with them is to raise the domestic productivity at the same pace it is growing in the international economy.

3.7 Population policy

Population policy is important, particularly to agriculture, as economic conditions are such that agriculture is typically a producer of population for the economy as a whole as well as a producer of agricultural products. This tends to aggravate the adjustment problems confronting the sector and contributes to the chronic tendency of per capita income in agriculture lagging

behind that of the non-agricultural sector (compare Johnson, 1986:28-29). In this regard it is interesting to note how seldom family planning programmes focus specifically on the agricultural sector.

An important part of governmental policy should be aimed at making family planning schemes and technology accessible to all members of the community. Secondly economic growth (that is increase in per capita income) plays a significant role in changing the economic alternatives confronting families, leading them to substitute quantity children with quality children. The problem of depending solely on economic growth to solve the problem is that the process takes so long. The correct role for governments is to intervene on the side of human capital. It involves extensive support for education and training, for improved nutrition and health. Education aimed at women increases their opportunity income (Nieuwoudt, 1987:5). The income women can earn outside the home is an important cost of bearing children. The demand for children tends to decrease as expected child mortality rates decline. Thus, nutrition and health programmes are important to the greater population and family planning programme.

3.8 International institutional issues

Another important issue in economic and development policy is the institutional arrangements for the international economy (Hayami & Ruttan, 1985 and Ruttan, 1992: 32). The world's economic integration, driven by rapid technological developments in the transport, communication and computer sectors, has outpaced the political and institutional development and integration by far. A decade ago, for instance, it would not have been technically possible to participate in the international capital markets as it is now. A huge effort is required to upgrade and modernise the institutional arrangements for the emerging international economy, including the creation of new arrangements (compare Van Rooyen, 1997:189 and Otto & Darroch, 1992:247).

4 CONCLUSION

As mentioned in the first section, it is true that a country should want to see its agriculture becoming a smaller part of the general economy. It is in fact the sign of a developed economy, as it indicates that the majority of the economy's productive capacity is being utilised for services and goods associated with higher levels of per capita income. The question is how to achieve this transformation in an effective and equitable manner. The implications of the analyses above are that it should be done by investing in

modernising the agricultural sector. Agriculture can be the engine or driving force of general economic development, with the social rate of return on these investments being very high, while the benefits of the development are distributed in favour of the poor.

Critically, modernising agriculture requires the development of a viable research and extension system, the education of the rural population and access by farmers to modern inputs such as fertiliser, pesticides and livestock medicine at reasonable prices. In addition, favourable economic policies, which supply essential incentive measures, are required for farmers to adopt the new technology.

In the second section policies that can promote agricultural development are explained; in particular those policies that aim to improve productivity and per capita income of rural people. The following policies received attention: price and incentive policies, factor market policies, investment in human capital, investment in physical infrastructure, improvement of income distribution, decline in external terms of trade, population policy and international issues. The crux is that policies for promoting agricultural development must be based on a clear understanding of the process itself and how agriculture is related to the greater economy of which it forms part. In conclusion, I confirm Schuh & Brandáo's (1992:904) thought that policy analysts will always make mistakes in drafting and implementing policies, but that they must learn by doing. The tragedy of errors is not that they are made, but that communities and policy makers learn so little for future application from their own errors or the errors of their neighbours.

NOTES

1. *Based on Schuh (1997).*
2. *Based on Schuh and Brandáo (1992).*

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