

Viability of Saudi Arabian agriculture

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During the 1970s and 1980s, the Saudi Arabian government has paid more attention to the country's agricultural sector than in the past, increasing expenditure and loans to farmers. Spectacular increases in output have resulted. This Viewpoint highlights some of the features which characterize Saudi agricultural development, particularly in relation to private v public-sector expenditure. The author concludes that the rapid expansion cannot continue, and that the opportunity for the country to achieve a viable agricultural sector has passed.

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The geography, climate and topography of Saudi Arabia have perhaps their greatest impact on the country's agriculture. It is in this sphere that such elements as frequent droughts, sudden changes in winter and summer temperatures, windstorms and water shortages are directly responsible for limiting both the maximum area under cultivation and the varieties of product produced in commercial quantities. In addition to these difficulties, the very poor and saline soil imposes constraints on agricultural development to a degree not encountered by other countries.

This bleak picture is corroborated by the fact that, of the 220 million hectares of land in Saudi Arabia, only 4.5 million hectares are arable. Furthermore, only 525 000 hectares were under cultivation in 1981: little over one-tenth of the arable land. The major reason is the inadequacies in necessary agricultural infrastructure, including dams, irrigation and drainage networks, water wells and extensive road systems linking agricultural areas with their markets.¹

Historically, the sector has received scant attention from the authorities. In large part this stemmed from the belief that:

- Saudi Arabia's national comparative advantage was not in agriculture, and
- Relatively cheap food could always be bought from the world's

surplus countries against exports of higher valued hydrocarbon products.

Three events in the 1979s, however, made the planners pay more attention to the agricultural sector in the Second and especially Third Plan periods:

- The emerging worldwide food shortage.
- The emergence of veiled threats of food embargoes by the major supplying countries (presumably to counter oil price increases).
- The more sobering realization that industrialization in the kingdom will not be adequate to provide sufficient jobs to employ a rapidly growing Saudi workforce.

Clearly the increase in oil revenue after 1973/74 facilitated increased allocations to the sector. During the Second Plan (1975-80), for example, the Saudi government budgeted and spent approximately \$9.0 billion in current prices on agricultural and related water programmes. In addition, the Saudi Arabian Agricultural Bank (SAAB), the government's main conduit to farmers for loans and subsidies, disbursed another \$1.0 billion during this period.

During the Second Plan, the real value of the agricultural sector in the kingdom's Gross Domestic Product (GDP) increased at 5.4% per annum, surpassing the 4% per annum growth

¹Cecil Tunclap and Ugur Yavas, 'Agricultural development in Saudi Arabia: present status and prospects', *Third World Planning Review*, November 1983, p 333.

rate targeted for the period. However, this growth rate was only one-third as rapid as the impressive growth rate recorded by the total non-oil sector during the same period.

Agriculture performed even more strongly during the Third Plan (1980–85), with a sizeable increase in private investment, growth in output of 8.7% per year, expansion of the workforce by 2.5% per year (despite a planned contraction at a similar rate), and the achievement of self-sufficiency in wheat. Much of this progress was achieved as a result of generous government loans and subsidies at both input and output levels. Loans granted by the Saudi Agricultural Bank increased particularly rapidly² after the oil price increases of 1973–74 and 1979–80. In fact, subsidized loans from the Bank increased from 2.9% of the total value of agricultural output in 1974 to nearly 50% in 1983. The ratio of subsidized loans to total commercial bank private credit also increased from 0.8% to 7.3% during this period.

However, beginning in 1984 there has been a dramatic fall in the volume of loans and subsidies allocated to agriculture. In fact, it is now accepted that with the post-1982 decline in government oil revenues, the experiment in massive government support for agriculture will be significantly reduced. In essence the government is shifting much of the burden of future investment to the private sector.

There is considerable opposition to any reduction in farm support or other government subsidies to the sector. In fact, a very influential 'farm lobby', in part financed by the huge profits made possible by government programmes, has developed in Saudi Arabia.³ The reason is fairly simple: the subsidized price of wheat is determined not by the fact that it currently stands at around five times world prices, but that, at SR2000/ton, it offers a fair profit margin over production costs. These are estimated at about SR1250/ton on the efficient farms. The farm lobby consists not only of large private wheat farmers, but also of large provincial joint stock companies handled by royal governors.

There is no question that most of

the accelerated growth in agricultural output over the past decade can be attributed to various government programmes and support. These include, in addition to interest-free loans and subsidized prices noted above, the free distribution of land and outright subsidies for buying machinery, fertilizers and other materials.

With the decline in oil revenues beginning in 1982, a cutback in some of these programmes was only a matter of time. This, together with the introduction of water tariffs for heavy users, has produced widespread concern in official circles that the attractiveness to local businessmen of further investment in this sector may be rapidly declining.

In this context, it is of interest to assess the future viability of the sector.

Government programmes

Clearly, any assessment of the sustainability of growth in the agricultural sector involves identifying the relative importance of factors that have contributed to the sector's output in recent years. As noted above, credit to the agricultural sector increased dramatically during the post 1973–74 oil boom, with most of the funds provided by the Agricultural Development Bank. In terms of future policy, it is important to determine:

- Have these funds⁴ been effective in increasing the sector's output?
- Could other measures such as the overall growth of government demand and/or expansion of private-sector expenditures be as effective in the future in stimulating increased agricultural output?
- How important have oil revenues *per se* been in stimulating agricultural production (compared with other sectors)?
- How important has commercial credit in general been to the sector's expansion (again, compared to that of other sectors)? In other words, given required cutbacks in government programmes, could the commercial banking system be expected to fill the financial vacuum for the agricultural sector?

²Data are from the Saudi Arabian Monetary Agency, *Annual Report*, various issues.

³Economist Intelligence Unit, *Country Report: Saudi Arabia*, No 3, 1986, p 10.

⁴There are no time series figures for subsidies paid to farmers. There is no evidence, however, that these have varied differently than credit has over time. The conclusions presented here, therefore, apply in principle to the government's subsidy programme.

In order to gain some insight into the impact of government subsidized loan programmes, a model⁵ was constructed whereby it was assumed that output in the agricultural sector expanded over time as a result of various impacts – either through increasing the overall demand for agricultural output or through lowering the costs of production in the sector.⁶

In terms of the first two questions posed above, several clear patterns characterize the role of agricultural credit and overall demand effects on Saudi Arabian agriculture:

- In general, agricultural credit is significant and very strong in its impact on agricultural output.
- Agricultural output follows a distributed lag pattern, whereby increases in overall expenditures or agricultural credit not only affect production in the current year, but also are significant over time in contributing to increased production.
- Interestingly enough, after accounting for overall demand and supply effects produced by (a) money supply and (b) agricultural credit, government expenditures and private-sector expenditures do not induce further expansion in the agricultural sector.
- Agricultural credit experienced a great increase in volume after the oil price increases in 1973–74, but apparently this credit has undergone a significant structural change in that its productivity or effectiveness – while still positive and strong in expanding the sector's output – experienced diminishing returns after 1973.

Clearly, agricultural credit has been a major factor accounting for Saudi Arabia's agricultural boom. It is important to note that it has been much more significant than the expansion of either private or government demand. In other words, Saudi agriculture appears largely supply driven, and based on (artificial, ie subsidized) cost-reducing government programmes rather than the more common situation in successful developing

countries whereby the sector gradually expands to satisfy an overall expansion in the demand for food.⁷ This fact calls into some question the viability of the agricultural sector. More precisely, given the fact that the country has been rapidly expanding its agricultural base through fairly high levels of subsidies that cannot be sustained indefinitely (given anticipated oil revenues over the next few years), the future of the sector is uncertain at best.

Since these results were somewhat surprising, it was of some interest to see if they were confirmed by alternative tests. Comparisons with the impacts on other sectors produced by credit and the expansion of private- and public-sector demand should also provide additional insights to the mechanisms at work in inducing expansion in private-sector output.

The first test examined the impact of commercial bank credit on the sector's output, and found that:

- The agricultural sector has not been responsive to the general expansion in commercial bank credit. Output in the sector appears, therefore, only responsive to the specialized credit and subsidies from the Agricultural Development Bank and not to the overall credit expansion (including some specific loans to the agricultural sector).
- Manufacturing, wholesale and retail trade, and non-oil income were all strongly stimulated by commercial bank credit.
- Of these sectors, however, manufacturing suffered a proportionate reduction in credit, with wholesale and retail trade perhaps experiencing an increased proportion of credit after 1973.

The next factor examined is the mechanism by which oil revenues have had an impact on agriculture and non-agricultural sectors. In addition to their direct demand linkages, oil revenues have the potential to contribute to sectoral growth indirectly through spread or carryover effects.⁸ This indirect contribution to growth embraces Hirschman-type linkages⁹

⁵The full model and detailed statistical analysis are presented in Robert E. Looney, *Response of the Saudi Arabian Private Sector to Government Initiatives in Agriculture*, Working Paper, Department of National Security Affairs, Naval Postgraduate School, Monterey, CA, 1987. It is available from the author upon request.

⁶See, for example, the framework developed in Robert E. Looney, 'The impact of petroleum exports on the Saudi Arabian economy', in Robert Stookey, ed, *The Arabian Peninsula*, Hoover Institution Press, Stanford, CA, 1984, pp 37–64.

⁷Bruce Johnston and John Mellor, 'The role of agriculture in economic development', *American Economic Review*, September 1961, pp 571–581.

⁸For a precise definition of these concepts see M.M. Metwally and H.U. Tamaschke, 'Oil exports and growth in the Middle East', *Kyklos*, 1980, p 500.

⁹A.O. Hirschman, *The Strategy of Economic Development*, Yale University Press, New Haven, CT, 1958.

and can broadly be considered as a sequence of multiplier-accelerator mechanisms.

In Saudi Arabia's case the relative degree of direct impact and sectoral spread effects emanating from the oil sector:

- Do not appear to have had a very significant impact on the agricultural sector through their indirect linkage or spread effects.
- Do have a significant impact on other sectors, with several sectors receiving a strong stimulus from expanded oil exports. These include: mining, manufacturing, construction, wholesale and retail trade, and transportation and communications.
- Have created some absorptive capacity problems in the post-1973-74 period, notably in wholesale and retail trade and in transportation and communications.

In general, therefore, the agricultural sector was somewhat unique in not receiving benefits from the spread effects associated with the development of the oil sector.

Similar tests were performed to determine the differential impact on sector output of increases in private-sector demand, and increases in public-sector expenditures.

- As in the results discussed above, agricultural output is apparently unresponsive to increases in private demand (which includes private-sector consumption);
- On the other hand, manufacturing, wholesale and retail trade, transportation and communication, and overall non-oil income have been stimulated over time by increased private-sector expenditures.

In general, therefore, a number of private-sector activities have expanded to satisfy a growing demand for goods and services generated by increased levels of private-sector consumption and investment. However, the agricultural sector does not appear to be one of these activities. In fact, the picture that emerges is one of

agriculture being something of a special case in that, in contrast to a number of other private-sector activities, the sector is not particularly responsive to increased levels of demand generated directly by either the private or public sector.

If not directly, government expenditure must impact indirectly on the agricultural sector by expanding the overall volume of credit provided by the Agricultural Development Bank. Here several interesting patterns have developed over a period of time:

- Oil revenues have been more instrumental in increasing agricultural credit than government expenditures; that is, agricultural credit is much more closely linked with the receipt of oil revenue than with the general disbursement of these revenues in the form of government allocations. Agricultural credit, therefore, follows a pattern somewhat different from the normal expansion or contraction in public-sector allocations.
- The proportion of oil revenue allocated to agricultural credit fell dramatically during the high and expanding oil revenue years - 1974-82.

There are only weak distributed lag relationships between oil revenue and government expenditures, indicating that credit programmes to this sector are not as continuous as in the case of other programmes, and that credit allocations are susceptible to erratic ups and downs depending on the movement in oil revenues.

Summary and conclusions

To respond to a number of concerns, the Saudi government has in the past decade provided a massive volume of funds for the development of the agricultural sector. The results have been spectacular in terms of overall increases in output. Oil revenues can and will continue to provide the means to overcome directly or indirectly some of the major constraints. However, the analysis above identifies some major concerns facing Saudi agriculture:

- The sector has been almost entirely dependent on government loans and subsidies for its expansion.
- In contrast to many other private sectors in the kingdom, the sector has not been responsive to increased demand in the form of overall expansion of purchasing power or expenditures.
- Also in contrast to several other private sectors, agriculture does not appear to be responsive to non-subsidized credit from the commercial banking system.
- Because agricultural credit appears to be more closely related to increases in oil revenues than government expenditures, it appears that this sector will not be supported to the extent that other programmes will be through spending out of the public sector's foreign portfolio.
- On the other hand, reduced allocations to the sector should, because of their low productivity during periods of high oil revenues, increase the marginal productivity of future, albeit lower, levels of expenditure. The net result of this effect should be to

lessen somewhat the effect lower government expenditures would normally be expected to have on output.

In short, one cannot be as optimistic as C. Tunclap and U. Yavas were only several years ago:

At the present and for the foreseeable future, Saudi Arabia's oil-wealth will provide the necessary hard currency to finance imports of food. However, it should not be forgotten that there is a 'window of time' for Saudi Arabia for diversifying its revenue base which at the present time comes from the export of one depleting source, crude oil. Developing a modern and effective agricultural sector to usher Saudi Arabia towards self-sufficiency in food is one avenue open to the Government planners. However, the real challenge facing Saudi Arabia is to arrive at this development objective long before the 'window in time' closes.¹⁰

The analysis above, however, leads to the unmistakable conclusion that rapid expansion of the agricultural sector along the lines achieved in the Third Plan period is a luxury that even the Saudis will be unlikely to be able to continue to afford. Unfortunately for the kingdom, the 'window in time' for achieving a viable agricultural sector appears to have closed.

¹⁰See Tunclap and Yavas, *op cit*, Ref 1, p 346.