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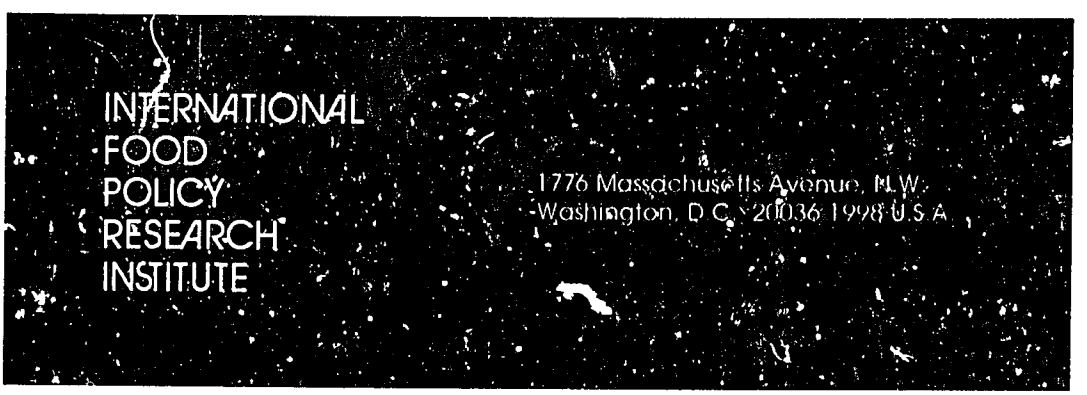

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The stagnation of Sahelian agriculture under seemingly unchangeable exchange rates has led to calls for supporting growth and food security through protection of cereals. It is argued that this will harm both objectives by ignoring the true comparative advantage of large parts of the region in livestock and other exports to the coast. High cereals prices in the Sahel raise costs of production in all of agriculture to uncompetitive levels. Protectionist policies for improving cereal self-sufficiency in Sahel and non-African dumping of livestock products on the coast hinder sustainable agricultural development in the interior.

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Many commentators have noted the decline in cereals self-sufficiency in the Sahelian countries over the past 20 years, illustrated for Burkina Faso in Table 1. For West Africa as a whole, rice and wheat consumption increased on average by more than 16 kg/cap/yr and millet-sorghum declined by 22 kg/cap/yr over the 1960–83 period.[1] Influential voices at the Club du Sahel and CILSS (Comité Permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel) policy conferences at Mindelo in 1986 then suggested that the visible stagnation of Sahelian agriculture and the rise of rice and wheat consumption in the Sahel were linked.[2]

They are seen under this view as the joint outcome of discriminatory pricing policies against local cereals, the latter being implemented by cheap imports of 'dumped' cereals at overvalued exchange rates. This seems to have led to the conclusion – widely held in Europe, especially among non-governmental organizations in the development field – that higher cereals prices through protection to cereals alone, in the absence of other feasible options, is key to revitalizing Sahelian smallholder development.

While it was true that world cereals prices were at an all-time low in real terms in 1986/87, it is also a fact that they have risen by up to 50% since then and that imports of rice and wheat into the Sahel continue virtually unabated. Yet discussion in November 1989 at the Lomé policy conference on 'Regional Cereals Markets in West Africa', which was the official follow-up to the 1986 Mindelo conference referred to in the previous paragraph, continued to come back to the issue of protecting domestic cereals markets in order to stimulate Sahelian agriculture.[3] It therefore seems useful to lay out heuristically the assumptions of the 'cereals protection as development' strategy position in the context of recent results from policy research on Sahelian agricultural production, consumption and transactions costs for trade. Having found that the facts in the Sahel do not accord well with the assumptions underlying the cereals-protectionist position, the article will then go on to lay out what seems to be the real set of issues in getting Sahelian agriculture back on a long term growth track.

One aspect of life in the Sahel that everyone agrees on is the very high

[1]C. Delgado and T. Reardon, 'Policy issues raised by changing food patterns in the Sahel', in *Cereals Policies in Sahel Countries: Proceedings of the Mindelo Conference*, CILSS/Club du Sahel/OECD, Paris, 1987.
[2]See other papers in *ibid*
[3]J.M. Pradelle, 'Un séminaire CILSS/Club

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Table 1. Sources of cereals consumption in Burkina Faso, 1969–86 (% shares of national consumption).

	1969–72	1973–76	1979–82	1984–86
Domestic production	95	92	90	79
Commercial imports of rice and wheat (primarily non-African sources)	2	2	4	7
Commercial imports of other cereals (primarily maize from the coastal countries)	–	2	2	6
Food aid	3	4	4	8

Sources. Computed from FAO production, trade and food aid data tapes and UN population estimates

cost of transport for bulky items. In a 1986 survey of agricultural transport costs, Zampou found that long-distance grain shipments within the Sahel countries in large trucks on paved roads paid 28–30 CFAF per ton/km in transport costs.[4] The implication of this is that the interior countries of West Africa have a high rate of natural protection against cereals imports. Conversely, they have a handicap when it comes to exports In economic terms there is a large premium for the price at which it pays to import to the interior over the world price for a good that is 'importable' to the Sahel, such as rice, since the price received must cover purchase costs at the coast plus transport costs, etc, to the interior (ie transaction costs). The price that just does this is the import parity, defined in relation to the world price and the economic costs of importing. Conversely, a Sahelian exportable, such as peanuts, must receive enough abroad to pay domestic producers plus the transaction costs of exporting (the export parity price).

The result of high transport costs, in addition to other transaction costs for agricultural trade in the Sahel, is to create a proportionately very large wedge between import and export parity prices for all agricultural goods. Delgado found for Mali, for example, that rice has sold in retail markets in Bamako for close to its import parity since the late 1970s; the export parity (adjusted to retail level) was about one-third of the actual market price. However, the market price of millet has fluctuated wildly between the import and export parities since at least 1970. In 1986 the average Bamako retail price for millet was measured at 55 CFAF/kg, whereas the (adjusted to retail) import parity was 99 CFAF/kg and the adjusted export parity was 12 CFAF/kg.[5]

Rice and wheat tend to sell in Sahelian cities at close to their true import parities, despite active parastatal marketing of these crops. This is because it is fiscally too costly to subsidize consumers of these crops for long through price intervention, especially now that a large number of people are consuming them. On the other hand, attempts to keep consumer prices above import parities soon meet political dissatisfaction, as was the case in Senegal in 1988. Market prices of coarse grains such as millet, which continue to be the major source of calories in the Sahel, tend to fluctuate between import and export parities, driven primarily by harvest outcomes that in turn depend on highly variable weather outcomes. Market prices of exportables such as peanuts and cotton tend to be close to the export parity for these goods, since Sahelian demand tends to be too weak to absorb local production.[6]

This situation is depicted by a partial equilibrium trade graph in Figure 1, which depicts the separate market conditions for the three major types of agricultural goods in the Sahel.[7] The cereals-protection view offered at Mindelo and reaffirmed by many at Lome is depicted in the figure by the upward shift of the rice supply curve, due to an

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du Sahel: les échanges commerciaux entre pays d'Afrique de l'Ouest un facteur d'intégration régionale', *Marches Tropicaux et Mediterranéens*, No 2298 24 November 1989, pp 3375–3377.

[4]B. Zampou, 'Administrative, financial, and legal obstacles to the circulation of cereals between CILSS countries: the example of Burkina Faso, Mali and Nigeria', in *Cereals Policies in Sahel Countries Proceedings of the Mindelo Conference*, CILSS/Club du Sahel/OECD, Paris, 1987 At the time, approximately 350 CFAF = US$1.00

[5]C Delgado, 'The role of prices in the shift to rice and wheat consumption in francophone West Africa', paper prepared for the International Food Policy Research Institute/Institut Sénégalais de Recherches Agricoles Conference on the Dynamics of Cereals Consumption and Production in West Africa, Dakar, 15–17 July 1987.

[6]Actual producer prices are often even lower than the true economic export parity, since parastatal marketing boards that are active in these crops tend to charge a higher margin than is strictly necessary for trade.

[7]The markets are shown together on one graph for compactness of presentation; the 'world price' applies to the market being considered. It is not suggested that the world prices of the three types of commodities are the same.

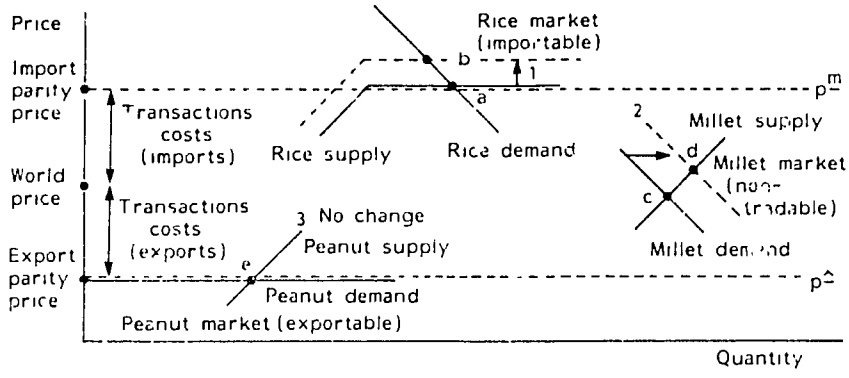

Figure 1. Cereals protection as a development strategy in the Sahel.

Hpothetical sequence of events
1. Tarih policy raises the supply price of importable cereals from (a) to (b)
2. Substitution of domestic consumers into domestic coarse grains raises the price (and supply) of the latter from (c) to (d)
3 These resource shifts allegedly have no effect on exportables at (e).

increased tariff on rice. The net effect shown on the graph is to increase domestic output of millet, reduce imports of rice and leave exports of peanuts unchanged The key assumptions here are that: (1) the demand for rice is price-elastic, leading to rapid reductions in imports as price rises; (2) decreased consumption of rice is quickly shifted into increased demand for millet, (3) increased demand for millet encounters a price-elastic supply of millet averting major price rises for domestic cereals; (4) the shift in consumers' resources to government and rice producers through protection and to millet production has no cost in terms of other sectors, ie exportables and non-cereal importables.

Unfortunately, recent research does not square with this somewhat optimistic view of the world. Casting the argument somewhat differently, for cereals protection to be a viable development strategy in the Sahel the following five points must be valid:

- Shifts in cereals consumption patterns are driven by relative prices between rice and coarse grains, such shifts can therefore easily be reversed by price policy alone. Work by Delgado,[8] using national-level annual data for five countries over the 1966–86 period, and by Reardon,[9] surveying his own and other results from detailed household-level fieldwork in the 1980s in the Sahel, suggests that this is not the case Non-price factors such as those associated with urbanization and the opportunity cost of time tend to play a much larger role than relative prices in shifting consumption patterns.
- Major cereals price increases will improve both welfare and food security in most rural areas of the Sahel. Work by Reardon, and by Reardon, Matlon and Delgado, shows that this is not true in Burkina Faso; other work has shown that it is not true either in Mali or Senegal. From 20% to 40% of rural households are typically net purchasers of cereals in these countries.[10]
- Coastal people in West Africa will provide an elastic market for periodic surpluses of millet and sorghum in Sahel. Unfortunately, consumption shifts in the coastal countries also suggest that this will not be the case. Furthermore, the rapid development of hybrid maize in these countries is providing a cheaper and more reliable alternative source of supply of coarse grains for coastal consumers and stockraisers.[11]
- Raising the price of cereals relative to all other rural income sources does not raise production costs and reduce employment in other farm activities such as livestock production, artisanal activities and cash crops. Unfortunately, research shows that people in semi-arid West Africa typically spend 70–90% of total income on basic food staples.[12] There is a close link between cereals prices

[8]C. Delgado, 'Why is rice and wheat consumption increasing in West Africa?', paper presented at European Seminar of Agricultural Economists, Monpellier, France, 29 May–2 June 1989 (mimeo)
[9]T Reardon, 'Cereal demand in West Africa: implications for Sahelian regional protection', paper presented at the CILSS/Club du Sahel Conference on Regional Cereals Markets in West Africa, Lome, Togo, 6–10 November 1989
[10]*Ibid*, T Reardon, P Matlon and C Delgado, 'Coping with household-level food insecurity in drought-affected areas of Burkina Faso', *World Development*, Vol 16, No 9, September 1988, pp 1065–1074, Josué Dione, 'The commercial behavior of farmers and regional cereal trade in West Africa', paper presented at the CILSS/Club du Sahel Conference on Regional Cereals Markets in West Africa, Lome, Togo, 6–10 November 1989, J Lombard, *Problemes alimentaires et strategies de survie dans le Sahel senegalais les paysans serere*, Thèse de doctorat de troisieme cycle, Universite de Paris X – Nanterre, January 1988.
[11]C. Delgado, 'Cereals protection within the broader regional context of agricultural trade problems affecting the Sahel', paper presented at the CILSS/Club du Sahel Conference on Regional Markets in West Africa, Lomé, Togo, 6–10 November 1989
[12]P.B R. Hazell and A. Roell, *Rural Growth Linkages: Household Expenditure Patterns in Malaysia and Nigeria*, Research Report No 41, International Food Policy Research Institute, Washington, DC, September 1983; T. Reardon and C. Delgado, 'Income diversification of rural households in Burkina Faso', in *Structural Change in African Agriculture*, IFPRI Policy Briefs No 5, International Food Policy Research Institute, Washington, DC, 1990

Table 2. Sources of meat consumption in Côte d'Ivoire, 1969–87 (% shares of national consumption).

	Historical trend, 1969–72	Drought, 1973–76	Recent events, 1984–87
Domestic production	11	15	38
Live animal imports (primarily from the Sahel)	85	70	37
Meat imports (primarily from EC and Latin America)	3	15	25
Average annual meat consumption per capita	7 5 kg	6 3 kg	11.4 kg

Sources 1969–76. J Staatz, 'Meat supply in Ivory Coast', in C. Delgado and J Staatz, eds, *Livestock and Meat Marketing in West Africa*, Vol III, *Ivory Coast and Mali*, CRED, University of Michigan, 1980 1984–87 Various authors 'Les importations massives de viande CEE une calamité nationale', *Afrique Agriculture*, Etude Speciale No 6, No 164, June 1989

and wage costs. A development strategy based on raising cereals prices relative to all other prices must face the fact that this will discourage labour absorption outside cereals production by raising the cost of labour [13]

- Sahelian farmers do not have better alternatives for engaging in economically viable and environmentally sustainable activities to generate incomes and food entitlement than production of millet and sorghum for export. Reardon, Delgado and Matlon show that farmers in rural Burkina Faso are in fact heavily engaged in livestock, cash cropping and non-agricultural activities.[14] The issue then becomes whether these activities can provide a viable basis for agricultural growth if the demand prospects for millet and sorghum as a food crop are limited.

Search for a viable strategy

Historically, export flows from the Sahel consisted primarily of annual non-food crops and their derivatives, such as cotton and groundnut oil exported to outside the region, and livestock flows to the coastal countries, consisting primarily of animals on the hoof. This trade expanded rapidly during the 1960s.[15]

However, disruption of world commodity markets has led to pessimism in the Sahel about export-led agriculture. Besides the recent very low world cereals prices after the 1985 US Farm Bill, the West African coastal countries have been flooded since the mid-1970s with meat dumped first by Latin America and then by the EC, milk products from the latter, cheap vegetable oil from Malaysia, and low world cotton prices after China's emergence as a major producer. Table 2 shows that in Côte d'Ivoire, for example, the Sahelian market share for meat has fallen from the historical mean of 85% to less than 40%. In the 1984–87 period Côte d'Ivoire imported about 2 kg/cap of meat and 6 kg/cap of liquid milk equivalents from the EC.[16]

The competitiveness of Sahelian agriculture has become severely compromised over the past 15 years, a process strengthened by the progressive overvaluation of the CFA franc (currently estimated to be about 40% in several Sahelian countries). The effects of this became especially notable on a West African regional basis with the effective devaluation of the currencies of Ghana (1984 onwards) and Nigeria (1986), leaving the Sahelian countries with high effective demand for imports, but uncompetitive exports on a regional basis.

This can be seen within the franc zone in the case of relative beef and starch prices in Mali and Côte d'Ivoire. Table 3 shows the evolution of each retail price series relative to the 1979–82 average for that series. In

[13]Delgado, *op cit*, Ref 11; S. Haggblade, P Hazell and J. Brown, 'Farm–non-farm linkages in rural sub-Saharan Africa', *World Development*, Vol 17, No 8, 1989

[14]Reardon, Matlon and Delgado, *op cit*, Ref 10; Reardon and Delgado, *op cit*, Ref 12.

[15]C. Delgado, 'The changing economic context of mixed farming in savanna West Africa: a conceptual framework applied to Burkina Faso', *Quarterly Journal of International Agriculture*, Vol 28, Nos 3 and 4, July and December 1989.

[16]Delgado, *op cit*, Ref 11.

Table 3. Index numbers of consumer prices for beef and starchy staples in Abidjan and Bamako (1979–82 = 100).

	1969–72 (integrated market)	1974–76 (aftermath of drought)	1984–86 (aftermath of drought)
Côte d'Ivoire			
Bone-in West African beef (fresh)	24	41	120
Boneless non-African beef (frozen)	na	92	109
Rice	51	98	146
Fresh cassava	22	39	124
CPI	30	47	131
Mali			
Bone-in local beef (fresh)	23	59	100
Rice	35	49	113
Millet	32	44	143
CPI	41	60	141

Sources Secondary price data from various national sources, see J Staatz, 'Meat supply in Ivory Coast, 1967–1985', in C Delgado and J Staatz, eds, *Livestock and Meat Marketing in West Africa*, Vol III, *Ivory Coast and Mali*, CRED, University of Michigan, 1980, C Delgado, 'The changing economic context of mixed farming in savanna West Africa a conceptual framework applied to Burkina Faso', *Quarterly Journal of International Agriculture*, Vol 28, Nos 3 and 4, July and December 1989, and J D Stryker, J Dethier, I Peprah and D Breen, *Incentive System and Economic Policy Reform in Mali*, Associates for International Resources and Development, Somerville, MA, 1987

both countries West African beef became more expensive relative to cereals in the period prior to 1979–82 and less expensive thereafter. Put differently, the real returns to beef production in Mali increased in the 1970s and fell sharply in the 1980s.

In Abidjan non-African frozen beef sold for almost the same price in *nominal* CFA in 1986 and 1987 as it did in the 1974–76 period, despite the fact that the local consumer price index increased threefold. In Mali between 1974–76 and 1984–85 (two drought periods) local beef prices increased by roughly 75% while the consumer price index increased by 125% and the price of rice increased by more than 130%. In Burkina Faso the real price of a basket of foods consumed by low-income people increased by nearly 90% between 1967–69 and 1984–86. However, real local beef prices increased by less than one-third over the same period. The supply-side problem of higher labour costs linked to higher cereals prices compounds the demand problem of competition from low-price meat from non-African sources

Ecologically, virtually every technological recommendation for maintaining or improving soil fertility in the Sahel emphasizes the need to increase the organic content of soils through mixed farming practices.[17] The latter have been considerably hindered by the unfavourable price trends for livestock products relative to cereals. Furthermore, the present situation is an incentive to growing cereals in fragile livestock areas and to decreased off-take from semi-nomadic herds on the common range. Both of these phenomena have been increasingly observed in the Sahel and are environmentally destructive.

It is striking that West Africa is virtually the only region of the world where cattle can live that does not have a viable local dairy industry. Even in Bamako, where notable progress has been made in this regard, 80% of milk consumed is imported, despite an estimated national dairy herd of roughly one milk cow per three inhabitants.[18]

The demand prospects for Sahelian exports to the coast have been further hurt by the debt crisis affecting the richer coastal countries. It is testimony to the extraordinary market potential for livestock products in Côte d'Ivoire that meat consumption per capita has nearly doubled over the last decade, despite the very difficult economic situation (Table 2). The probable explanation is that, although national income did not grow rapidly in Côte d'Ivoire in the 1980s, relatively low prices for meat and rapid urbanization continued to fuel meat demand. The expansion in meat consumption on the coast is likely to occur much faster still when per capita income growth resumes. The latter view is supported by

[17]H. Ruthenberg, *Farming Systems in the Tropics*, 2nd edn, Oxford University Press, Oxford, UK, 1976, J.M. Kowal and A.K Kassam, *Agricultural Ecology of Savanna: A Study of West Africa*, Oxford University Press, Oxford, UK, 1978, P. Matlon, 'The West African semiarid tropics', Ch 5 in J.W. Mellor, C. Delgado and M Blackie, eds, *Accelerating Food Production in Sub-Saharan Africa*, Johns Hopkins University Press, Baltimore, MD, 1987.

[18]V. von Massow, *Dairy Imports into Sub-Saharan Africa: Problems, Policies and Prospects*, Research Report No 17, International Livestock Centre for Africa, Addis Ababa, May 1989

work by Hazell and Roell that estimated expenditure elasticities for the late 1970s in a community of rural Northern Nigeria of 1.32 for fresh beef, 1.52 for milk, 1.83 for eggs and 2.82 for butter.[19] Analyses of FAO data by the Secretariat of the Consultative Group for International Agricultural Research (CGIAR)[20] show that West African diets are much lower in calories from livestock products (about 3%) than is the case in all other developing countries (more than 6%). This situation appears to be changing rapidly.

Livestock products still accounted for 3% and 7% of the total value of imports to Nigeria and Côte d'Ivoire, respectively, in the depressed period from 1980 to 1985. In the Nigerian case this accounted for well in excess of $400 million annually in terms of 1980 US dollars – a sum of the same order of magnitude as the agricultural GDP of its northern neighbour, Niger, during the same period. Actual – as opposed to recorded – Nigerian imports were probably substantially larger. Coastal imports of vegetable oils – another commodity for which income elasticities are high on the coast – are growing rapidly. Ghana and Nigeria are now both importers of cotton.[21]

Ghana and Nigeria appear to be re-emerging on solid growth tracks that will change their structure of demand. They are also investing heavily in their own agricultural and livestock sectors: in particular, productivity in hybrid maize is increasing rapidly in the Middle Belt. It is striking in Table 1 that commercial exports of cereals from the coastal countries to Burkina Faso during the 1980s drought were almost as important a source of consumption as non-African food aid. The Sahel has the potential to become an increasingly important market for the products of the northern parts of the coastal countries, provided that the Sahelians have purchasing power from their own exports.

In economic terms the current balkanization of West Africa makes no sense. Sahelian countries are attempting to focus on cereals production, despite the appearance of a comparative advantage for the latter in the more humid northern zone of the coastal countries. Meanwhile Nigeria, Côte d'Ivoire and Ghana have embarked on ambitious programmes to increase national livestock production. However, this has not been without cost to their own development. Technically, increased livestock production in the coastal countries, which are tsetse fly zones, has been made easier by the abnormally dry series of years this decade. However, a recurrence of historical rainfall patterns could greatly increase animal mortality. Second, population density in the coastal countries is increasing especially rapidly, leading to increasingly severe confrontations between herders and farmers. This raises the social cost of new livestock ventures involving extensive range feeding. Third, as the Middle Belt regions develop a comparative advantage in cereals production they also develop, by definition, an increasing interest in obtaining their feeder cattle from further north.

The conditions that depressed both domestic demand and coastal outlets for Sahelian livestock are rapidly changing. The EC 'meat mountain' stemming from the slaughter of the dairy herd appears to be gone. The 'milk lake' is drying up, which suggests that the urban dairies in West Africa will be weaned from reconstituted milk. As demand conditions improve, much will depend upon the capacity of technological change in grain production in the Sahel to alleviate the feed constraint with low-price grain and by-products, and to prevent labour costs rising even further relative to output prices.

[19]Hazell and Roell, *op cit*, Ref 12.
[20]CGIAR, 'TAC review of CGIAR priorities and future strategies', August 1985 (mimeo), cited in World Bank, Western Africa Projects Dept, *West Africa Agricultural Research Review*, 28 February 1987.
[21]Delgado, *op cit*, Ref 11.

On the supply side, in the case of both dairy and other types of livestock improvement the principal constraint has always been an adequate supply of low-cost high-energy feeds.[22] New cereals technologies for sorghum and maize offer hope for breaking this constraint at last, but only if cereals prices are allowed to fall.

Outside the agricultural sector, growth of employment in the informal sector, whether in rural or urban areas, will depend on keeping the price of the principal wage good, cereals, low.[23]

Conclusions

Events since the late 1970s in world markets for the traditional exportable products of the Sahel, especially livestock, oil seeds and cotton, have been devastating to long-run growth. This has been much more serious than in the case of cereals, which tend to be importables. It seems clear that the greatest likelihood for the Sahelian countries to be able to resolve their problems of access to export markets is at the regional level. The types of commodities that the rural Sahel is likely to have a long-run comparative advantage in are probably close to those that prevailed before the disruption of coastal West African agricultural markets by outside forces in the mid-1970s to date This probably includes a renewed emphasis on livestock products. However, progress will depend upon (a) lowering the cost of labour and feed through technological change in foodgrain production, and (b) lowering the cost and improving the availability of high-energy feeds for livestock. Even so, these products will probably not be realizable unless the CFA franc is substantially devalued *vis-à-vis* the Sahel's coastal trading partners, especially Nigeria and Ghana, at least for the purposes of agricultural trade The worst policy for both growth and food security in most rural and urban areas of the Sahel would be to implement policies that raise cereals prices relative to other prices.

Finally, it seems unescapable that the economic destiny of the Sahel is dependent upon the economic health of the major coastal countries. The success of the latter in developing or recapturing robust export markets outside the region – and the manner in which the donor countries choose to deal with debt problems on the coast – is of central importance to persons concerned about the welfare of Sahelian peoples. The long-run income prospects of the Sahel are closely tied to coastal incomes, which will stimulate demand for the commodities in which the Sahel has traditionally been a low-cost supplier.

[22]C. Delgado and J. Staatz, *Livestock and Meat Marketing in West Africa*, Vol III, *Ivory Coast and Mali*, CRED, University of Michigan, 1980, H E Jahnke, *Livestock Production Systems and Livestock Development in Tropical Africa*, Kieler Wissenschaftsverlag Vauk, Kiel, Germany 1982, von Massow, *op cit*, Ref 18

[23]Haggblade, Hazell and Brown, *op cit*, Ref 13, C Delgado, 'Questions a propos d'un espace régional protégé pour les céreales au Sahel', *Economie Rurale*, No 190, March/April 1989.