



HORTICULTURAL SUBSECTORS

Background

Key objectives of the CFA franc devaluation were to improve rural incomes by (1) stimulating export and domestic demand for locally produced agricultural products, (2) raising producer prices for these products, and (3) creating new employment opportunities in agricultural support activities. Many analysts speculated that the horticultural sector might respond positively following the devaluation due to improved competition in both European markets (green beans, for example) and African regional markets (onions, tomatoes), but the poor quality of data on horticultural production and trade made it difficult both to predict and to quantitatively measure the response. Consequently, INSAH, in collaboration with partners throughout the region, undertook a series of studies to describe and evaluate the post-devaluation production and marketing response for five horticultural crops: onions, garlic, tomatoes, potatoes, and green beans.

Objectives and Methods

As response to the devaluation was quite variable across crops and countries, a key challenge of the study was to understand the determinants of the different response patterns. This led to a focus on three questions:

- What factors differentiated the horticultural subsectors that exhibited strong, positive production and marketing responses from those that did not?
- Was a strong, positive production and marketing response associated with improvements in real income and welfare of subsector participants?
- What do these findings imply for future efforts to 'grow' the horticultural sector?

The analysis is based on studies conducted from 1994 to 1997 in six countries: Mali, Senegal, Burkina Faso, Benin, Niger, and Tchad and on secondary data from national statistical services and the FAO. **Numerous gaps and inconsistencies among the various data sources** made it very difficult to determine exactly what changes have taken place but brought to the surface one of the greatest challenges facing the horticultural sector -- the development of reliable data bases that can be used by subsector participants and policy analysts to assess past performance and develop strategies to stimulate subsector growth.

Results

African Markets: Motor of Development?

The evolution of the value of production and trade for the products studied raises a key question: Will the African regional market be the motor of development for the horticultural sector? Information in Table 1 supports an affirmative answer to this question because the subsector response for products targeted primarily at regional markets (onions, tomatoes, garlic, and even potatoes in Mali) were stronger after the devaluation than the response of products aimed at the European export market (green beans from Burkina Faso and export quality potatoes ('primeur') from Senegal). Production increased significantly for onions in Mali and Senegal, and for tomatoes in Benin. Precise numbers are not available for onion and garlic production in Tchad and potatoes in Mali, but it appears that this production, destined primarily for regional markets (Congo, Central African Republic, and Côte d'Ivoire, for example) increased substantially after the devaluation. By contrast, exports of green beans from Burkina Faso dropped by 10-20%. The value of onion production in Mali, Senegal and Burkina Faso reach 46 billion FCFA, much higher than the 6.2 billion FCFA generated by exports of green beans from the same countries, despite an increase in exports from Senegal (26%) and Mali (93%).

Table 1 : Evolution of production, exports and value

Product	Country	Production	1996 Value
		% 93-96	('000 000 FCFA)
<i>Onion</i>	Mali	+ 125%	17 061
	Sénégal	+ 70%	24 717
	Burkina Faso	na	4 400
<i>Potato</i>	Mali	(+)na	9 150
	Senegal	- 40%	1 870
<i>Tomato</i>	Benin	+ 36%	18 050
		Exports	Value
		% 93-96	('000 000 FCFA)
<i>Green Beans</i>	Mali	+ 93%	685
	Senegal	+ 26%	3 510
	Burkina Faso	-8 à - 24%	1 995

Source : FAO, ON/URDOC Mali, DH CDH Senegal, MDR Benin

It is dangerous to conclude from our study of only five crops and six countries that the African market for "basic" horticultural products (onions, tomatoes, potatoes, and garlic) could generate more income than European export markets, but aggregate import/export data for

West and Central Africa suggest this might be the case for most countries (Table 2). The average annual value of "basic" horticultural imports¹ for these regions was US\$98.493 million (1993-1996). Total fruit and vegetable exports from the two regions generated about three times more income than was spent on basic imports, BUT 72% of these exports were concentrated in two countries: Côte d'Ivoire (primarily pineapples) and Cameroon. Excluding these exceptional cases, we find that fruit and vegetable exports covered only 79% of "basic" horticultural imports, suggesting that each country needs to carefully evaluate the costs and benefits of import substitution versus European export strategies for the horticultural sector.

Table 2 : Average annual value (1993-19996) of imports and exports in West and Central Africa (WCA)

Imports		Exportations (ii)	
Product	Value ('000 US\$)	Zone	Value ('000 US\$)
Onions (i)	22 757	West Africa	226 720
Garlic	1 043		(66% Côte d'Ivoire)
Tomato		Central Africa	56 720
paste	58 788		(99% Cameroun)
Potatoes	15 905		
Total	98 493	Total WCA	283 440
		WCA minus RCI and Cameroun	78 131

Note : (i) Onions includes shallots, (ii) include all fruits and vegetables ; Source : FAOSTAT online data base, 1998

There are a number of factors that contributed to the rapid growth in the supply of these "basic" products. First, devaluation made local production more competitive with European imports. In addition, these products exhibit demand and marketing characteristics that facilitate subsector expansion: Onions, tomatoes, and garlic...

- represent an important share of total vegetable consumption throughout the West and Central African regions (10-25% for onions, 7-39% for tomatoes);
- are 'basic food products' consumed almost daily by both urban and rural households rather than 'luxury products' consumed primarily in urban areas, restaurants, and wealthier households;
- are imported from Europe by many countries in the region, even after the devaluation (Figure 1);
- can be stored and/or processed more easily--especially onions--than most horticultural products.

Potatoes do not exhibit all of these characteristics, particularly the strong local demand; this might explain the relatively weaker post-devaluation response for this subsector.

¹ Potatoes (other than export quality 'primeur' in Senegal), although much less consumed than onions and tomatoes, have entered into regional consumption habits, particularly those of urban consumers, hence we include them in the category of "basic" products.

In brief, the African demand for "basic" horticultural products is substantial. Our hypothesis is that with an appropriate mix of policies and investments African producers should be able to remain competitive and expand production of these products with less effort than it would take to expand into niche export markets (such as the green bean and 'primeur' potato markets recently targeted by Burkina Faso and Senegal) which are characterized by:

- weak local and regional demand, hence heavy reliance on European demand;
- strong competition in European markets by well-established exporters;
- difficult enforcement and litigation of international production and marketing contracts;
- very demanding quality, storage, and packaging requirements.

Production environment also an important determinant of response.

Rapid increases in production occurred more often in subsectors that (1) had a long history of production by local farmers, (2) were complementary to other crop production activities, and (3) had well developed systems for seed supply and inputs required to maintain soil fertility.

Availability of water and labor was important.

Increases in aggregate production were very strong in irrigated rice production zones where onions could be produced easily as a dry-season crop following the principal rice harvest (Office du Niger, Mali). High-cost irrigation infrastructure was not, however, a prerequisite; tomatoes in Benin are rainfed, and both garlic and onions in Chad are irrigated using hand-dug wells, as are most onions produced in Les Niayes, Senegal. In Niger, motor pumps were among the most popular means for watering onions. The key is that in all these cases, land and water were available and underutilized during the dry season prior to the devaluation, facilitating rapid expansion of acreage.

Fertilizers.

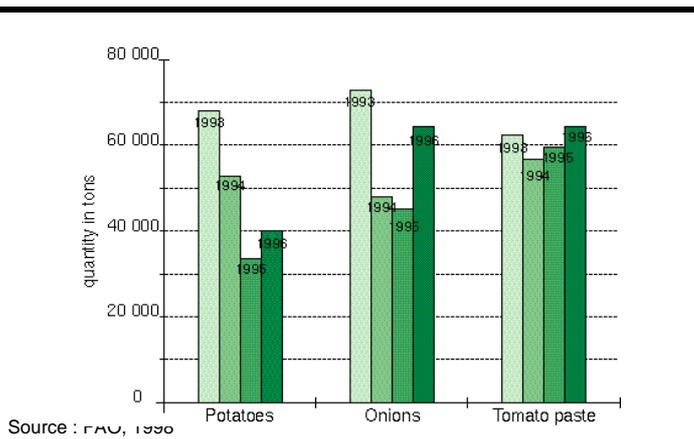
Although the rising cost of fertilizer was a problem after 1995, physical access to fertilizer was rarely a constraint for producers of the 'responsive' crops for which there was a strong output demand. A strong output demand can stimulate input demand and reduce many of the transactions costs -- described by various studies -- that exist in input markets. In some zones of high horticultural activity (for example, Ouadai in Tchad), soils are naturally fertile and farmers obtain good yields without inorganic fertilizer. In the irrigated perimeters of Mali and Senegal fertilizer distribution systems were already established to serve rice producers. In other zones with long horticultural experience, fertilizer retailers are numerous, though price competition is not always strong (for example, Les Niayes in Senegal).

Seeds.

One of the strengths of the onion, garlic, and tomato subsectors is their reliance on locally produced seed and/or relatively competitive markets for imported seed. Competing firms import onion or tomato seed in Senegal and have recently established branches in Mali.

In addition, private firms in Senegal have recently begun large-scale, local production of onion seed. By contrast, the lack of competition for imported potato seed -- and, therefore, the presence of high prices -- is a major constraint to expansion of production. In Mali, 96% of potato seed is imported by one company and potato seed represents 48% of production costs (seed represents less than 30% of costs for onion producers in Mali and Senegal).

Figure 1: Changes in «basic» horticultural imports in West and Central Africa



Source : FAO, 1996

Transport.

Ease of transport between production and consumption areas is another factor that enabled a strong production response. Good roads and short distances were a plus, but even poor roads and/or long distances did not prevent the expansion of production --onions in particular-- in zones served by long-established horticultural transport and marketing networks (for example, onions and garlic in Chad and onions exported from Niger to Côte d'Ivoire). However, transport costs along the relatively difficult Abeche-N'Djamena road in Chad represent 67% of marketing costs and 25% of wholesale price against only 10% of wholesale price for Malian onion along the paved road Niono-Bamako

Access to inputs.

Producers' access to input credit (usually in the form of production contracts) helped defray costs of production for European export crops, but farmers in subsectors exhibiting the strongest production response tended to finance their own inputs using income from other crops (rice producers in Mali, for example). Although some onion producers in Senegal and Mali obtained horticultural fertilizer on credit (usually through farmers organizations) most onion seed and fertilizer was financed by farmers themselves. This is generally true for tomato production also, except for some cases of contract production with local tomato paste processing plants such as SOMACO in Mali or SOCAS in Senegal.

Extension and other farmer support services.

Provision of extension and other farmer support services (training in input storage and production techniques and price information services, for example) acted as a stimulus in helping some subsectors to expand (notably onions in Mali and Niger. In Chad, extension focused on introducing storage techniques that helped farmers keep losses relatively low during a six-month period. By contrast, potato producers in Mali received little formal support in

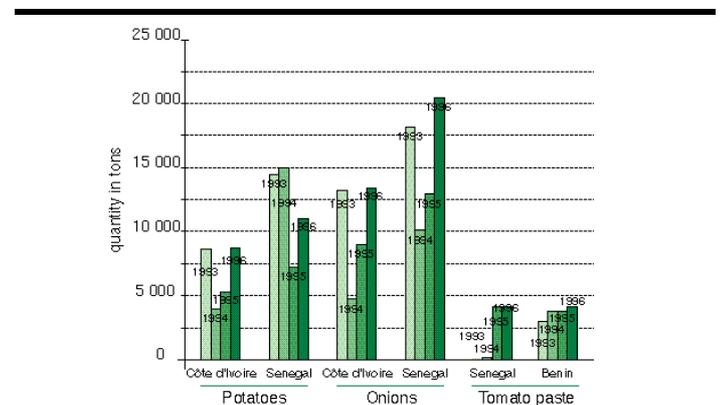
the form of extension advice and market information services. Although the need to diminish harvest season marketing gluts for potatoes brought about some Malian efforts to better space production and marketing, more work is required.

In sum, the competitiveness of African horticultural products could be substantially improved by better rural roads to reduce collection and transport costs and more competitive input markets. Furthermore, producer incomes could be increased by measures diminishing the likelihood of market gluts (better storage and timing of harvests), and subsector expansion might be faster if more credit were available.

Marketing in the presence of multiple constraints.

Subsectors that already had well-developed, open, marketing systems permitting new participants to enter freely were the ones that expanded most rapidly following the devaluation. Mali provides an excellent example of increased competition among onion traders. Wholesale and retail margins were reduced (margin rates decreased by 38 and 23% respectively), thereby keeping consumer prices from skyrocketing. Despite the lack of quantitative information on commercial transactions, subsector actors confirm that there was an increase in onion exports from Mali to Côte d'Ivoire. Chadian onion and garlic exports to Congo and the Central African Republic also increased. At the same time, European imports of onions, tomato paste, and potatoes dropped immediately after the devaluation but seem to have been climbing since (Figure 1)². In coastal countries (Senegal and Côte d'Ivoire) they were back to predevaluation levels or above by 1996 (Figure 2).

Figure 2: Change in «basic» horticultural imports Côte d'Ivoire, Senegal, Benin



Source : FAO, 1998

Surprisingly, the overall performance of the green beans export sector in Burkina Faso did not improve, despite rapid growth in the number of exporters shipping to both the European and West African coastal markets (about 12 new exporters in 1996). We have no clear explanation as to why the number of exporters increased while the aggregate quantities of export decreased, but suspect there may have been some issues of quality control due to the inexperience of the new exporters -- clearly a situation that warrants future monitoring.

² We do not have exact numbers for the share of imports coming specifically from the European Union, but, for onion, more than 50% of imports come from a single European country (Netherlands) and 98% of tomato paste imports in West and Central Africa come from Italy.

The most important marketing constraints were (1) storage losses (fresh tomatoes, potatoes), (2) inadequate capacity and high costs of processing (tomatoes), and (3) high costs and unreliable timing for transport (green beans). All forms of transport used in the horticultural sector tend to be unreliable and expensive (road, rail, and air), but the most vexing problem appears to be the air freight monopoly held by AirAfrique. Interestingly, Chadian traders shipping to Central African Republic and Congo negotiated discounts based on size and frequency of shipments (315 FCFA/kg), but evidence from Burkina Faso and Mali is worrisome with costs of airfreight to Europe ranging from 560-730 FCFA/kg. Senegalese exporters, because of the much higher level of tourist charters transiting Dakar, apparently were not required to rely entirely on Air Afrique; this resolved the problem of delayed shipments, but did not necessarily reduce shipping costs --560 FCFA/kg. For regional trade, there are no realistic options for ocean transport.

Although we have noted that the products for which the greatest response occurred tend to store better than other products, storage remains a major problem. Efforts to develop cold storage facilities for onions in Dakar appeared to be profitable the first year or so, but profitability is currently being compromised by low-cost (sub-standard quality?) imports from outside of Africa.

Although there was some improvement in the tomato processing sector, improvements were not always sustained (Mali) partly because of strong competition from Italian imports, which benefit from European subsidies³.

Given the importance we attach to regional markets, we must not ignore the constraints facing traders who operate in these markets: inability of banks to facilitate money transfers from one country to another, barriers to trade (illegal taxes and check points on overland transport) that lead to delays and product losses, and a lack of reliable public information on demand and supply of horticultural products in the region. For instance, taxes represent 40% of transport costs of onion between Galmi in Niger and Malanville in Benin, and the number of controls may reach 50 along the Ouagadougou-Abidjan axis instead of 6 official check points.

Impacts on income more positive for products targeted at African markets.

Although input prices increased considerably for many producers (fertilizer and imported seeds in particular, but also costs of operating irrigation pumps), there were substantial gains in nominal incomes per hectare and per labor day (Table 3).

Whether or not these increases represented increases in real income for rural households is difficult to determine because the only price indices available are based on urban consumption baskets. Using the cumulative urban inflation rate from January 1994 through December 1997 to deflate the 1997 incomes, we found gains in real income for Malian onion producers (+25%) in the Office du Niger. Senegalese onion producers appear to have lost some ground (-2%), as well as tomato producers in Benin (-8%), but these are probably not real losses if one allows that using the urban price index overstates the loss of income in rural areas. Furthermore, these apparent declines in the purchasing power of

horticultural income were substantially less than those associated with salaried employment, particularly government employment (real income losses of 23 and 36 % for Senegal and Benin).

Table 3 : Changes in income (gross margin per ha without family labor)

		Income		Well-being
		Nominal	Real	
Onion	Mali	++	++	+
	Chad	+	+	+/-
	Sénégal	++	+	
Potato	Mali	+		-
Tomato	Benin	++	+	
Green bean	Burkina Faso	-	-	

Symbols nominal income: (+ +) 40% ; (+) 0 - 39% ; (-) < 0%. Real income : (+ +) 20% ; (+) - 10 + 20% ; (-) < -10%. Well being : (+) Better in most cases ; (+ /-) mitigated change ; (-) Worse in most cases.
Source : Studies cited in footnote page 1.

As might be expected, there is substantial variability in farmers' perceptions about how their standard of living changed after the devaluation. The variability is illustrated by the responses to some qualitative questions about whether farm families eat better, worse, or about the same after the devaluation as before, in terms of quantity and quality. Given that horticultural incomes are secondary incomes, with crops such as rice, cotton, and peanuts generating the bulk of farm incomes in the areas studied, it is possible for horticultural incomes to increase but general well-being to decline. Results summarized in Table 3 show that the majority of onion farmers in Mali felt well-being had improved, but there was no clear pattern in responses for Chad, and indications are that the situation deteriorated among Malian potato producers.

Policy and Future Challenges

Actions needed to lift the principal constraints

- Improvements in road infrastructure;
- Reductions in transactions costs, especially those encountered in regional markets;
- Improved capacity, frequency, and competition for air freight shipments;
- Better market information services covering the entire West and Central African regions;
- Improved storage and processing technologies and research into ways of spreading out harvest and marketing over longer periods of time.

Need to develop strategies concerning the relative importance of African regional markets and European niche markets.

Niche markets for horticultural exports to Europe are often what governments, donors, and policy makers focus on when discussing the development of the horticultural sector in West Africa. Senegal, which has benefitted from substantial World Bank and European Union funding to promote horticultural exports to Europe seems to have done better in these markets than other countries in the CFA franc zone. Part of the

³A study by Solagrall notes a processing subsidy of about 34 FCFA/kg that, when applied to the producer price, makes the cost of basic materials less expensive than in Africa.

success here is linked to geography (Dakar offers easier access to Europe via air and sea than many countries in the sub-region). Nevertheless, one must ask what the best general strategy will be for countries in the CFA franc zone: a strategy focused on local and regional markets or one giving priority to exports outside the African region? These two options are not exclusive. But the orientation in the short-term is important because the choice of market focus determines which types of investments and policies will be most appropriate (type and location of storage or transport investments, choice of priority crops for research and extension activities). Development of European exports may be a better medium and long-term goal. Available data suggest that improvements in the trade balance could be obtained by most countries in the region (Côte d'Ivoire and Cameroon excluded) by increasing production of "basic" horticultural products. For example, the value of onions imported to Senegal (FAO 1994-96) was more than double the value of all fruits and vegetables exported⁴. The case of tomatoes warrants special mention. Imports of tomato paste for all of West and Central Africa are equal to more than twice the value of tomatoes produced in Mali, Burkina Faso, Benin and Senegal and represent more than half the value of "basic" horticultural imports for these countries (Table 2). How can this subsector be expanded when faced by an Italian tomato paste defying all competition?

For countries where physical access to Europe is more difficult, the horticultural sectors' response following the CFA franc devaluation suggests that in the short to medium run there may well be more income generated by improving response to local and regional demand than by exporting to Europe. In reality, production for the local and regional markets contributes more to GDP (Table 1). The regional market, despite the many challenges, is generally more open and less risky with respect to quality and health regulations. Participating in these markets, however, still involves stiff competition from Europe, some of it from exports of what appear to be sub-standard products (for example, potatoes).

Dealing with challenges in international horticultural markets.

- What are the best strategies to adopt given European policies concerning increasing export barriers in the form of rising health standards, possible reduction in tariff advantages, exports of substandard products to Africa, and subsidies of certain European subsectors?
- What are the lessons to be learned from problems with contract enforcement between African exporters and European importers?
- How can countries promote a balance that fosters open competition in export markets yet protects national reputations for exports of high quality products?
- How can air freight costs be reduced?
- How can banking systems become more responsive to growing need for international commercial transactions?

⁴ Values of 16.023 and 7.9 million US dollars for onions versus fruits and vegetables.

Closing Caveat

Policy analysis is not an easy task and the quality of the analysis is dependent on the quality of the data. Hypotheses and recommendations made in this synthesis are based on a careful examination of available data, but in closing we remind readers that the quality and quantity of data on horticultural production and trade in Africa is very poor; improvement of this data base is a sine qua non for sound horticulture policy analysis in Africa.

REFERENCES

Abdelwahid, Yacoub et Mahamat Foye. La filière oignon au Tchad quatre ans après la dévaluation du Franc CFA : compétitivité, performances et contraintes. INSAH/DPPASA /MDR.

Chohin-Kuper, Anne, Valerie Kelly et Dramane Mariko. 1998. Evolution du maraîchage dans la zone de l'Office du Niger au Mali. INSAH/IER.

COLEACP. 1996. Etude de diversification et de modernisation de la filière horticole au Sénégal. Rapport de synthèse (version provisoire).

David, Olivier. 1996. Les effets de la dévaluation du franc CFA sur les systèmes de production de l'oignon au Niger. CIRAD, Document de travail en économie des filières n°27.

Gnimadi, Aimé, Guy Mensah, Clément Gnimadi et Joseph Tonin. 1998. Etude de l'impact de la dévaluation du Franc CFA sur les filières tomate, piment, oignon et pomme de terre au Bénin. INSAH/CBRST.

Holtzman, John, S. 1996. Intra-regional trade of horticultural products in West Africa : towards a research agenda and an action plan. Bethesda : Abt Associates Inc.

Illy, Laraba. 1998. Impact de la dévaluation du Franc CFA sur la filière Haricot vert au Burkina Faso. INSAH/INERA.

Jadot, Yannick et Jean-Pierre Roland. 1996. Les contradictions des politiques européennes à l'égard des pays en développement. Solagral.

Kebe, Moustapha. 1998. La filière oignon au Sénégal quatre ans après la dévaluation du Franc CFA, changements en matière d'investissements, de productivité et de compétitivité. INSAH/ISRA.

Kelly, Valerie et Anne Chohin. 1997. L'évolution de la filière horticole en Afrique de l'Ouest après la dévaluation du Franc CFA. INSAH.

Kergna, Alpha Oumar et Kouroungo Dembele. 1998. Impact de la dévaluation du Franc CFA sur la filière pomme de terre au Mali. INSAH/IER.

Moha, Aliou et Samba Ly. 1995. L'impact de la dévaluation du Franc CFA sur les coûts de production de l'oignon et du coton au Niger. INSAH/INRAN/Université de Niamey.

Traore, Gnini Elise. Identification des contraintes essentielles au transport sur l'axe Ouagadougou-Abidjan et propositions d'actions concrètes pour l'amélioration du secteur. CILSS.

URDOC. 1997. Hivernage 96, contre-saison 96-97. Rapport d'activités. Zone Office du Niger de Niono, CIRAD-SAR.

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