NIGER: RICE AND COTTON POLICY

DECEMBER 1989

TECHNICAL REPORT NO. 106

Prepared for USAID/Niger

Conducted Under Contract with Abt Associates Inc.
and the Agricultural Policy Analysis Project, Phase II
(APAP II)

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PREFACE

This study was financed by USAID/Niger as a buy-in to the Second Phase of the Agricultural Policy Analysis Project (APAP II), and was implemented as part of the Mission's design of the Second Phase of the Agricultural Sector Development Grant (ASDG II).

The study was carried out in October-November 1989 by Bechir Rassas, Team Leader and Agricultural Economist from the International Science and Technology Institute Inc. (ISTI), a subcontractor to Abt Associates Inc., and Thierry Loutte, Agronomist/Agricultural Economist and independent consultant.

The APAP II study team wishes to thank USAID/Niger for coordinating the study. Special thanks go to Jim Goggin, Agricultural Economist in the Agricultural Development Office, Frank Martin, Economist in the Program Office, Roger Bloom, ASDG Program Officer in the Agricultural Development Office and Erna Kerst, Project Development Officer in the Project Design Office. The study team also acknowledges the generous cooperation of public officials and representatives of international organizations in Niger. The authors are, of course, responsible for any errors, omissions or misinterpretations.

ABSTRACT

The study, conducted for USAID/Niamey under Phase II of the Agricultural Policy Analysis Project (APAP II), analyzes efficiency of resource allocation in the rice and cotton sectors in Niger.

Nominal protection coefficients indicate that domestic prices of the two commodities have been above border prices. Effective protection coefficients are, in general, higher than the nominal protection coefficients, reflecting the subsidies accorded to farmers on certain inputs such as seed and insecticides.

Net returns, defined as gross revenue minus all fixed and variable costs, including family labor valued at market wages, average cfa 120,000/ha per year for rice and are positive in most years for cotton. However, when output and all inputs are valued at their opportunity cost, net returns become negative for both crops. Factors contributing to this shift include the input subsidy and the discrepancy between domestic and border prices.

Welfare analysis shows that present policies in the rice and cotton sectors reduce national income, for income gains to producers and the government are more than offset by income losses to consumers who, as a result of the import tariff and other taxes, pay higher prices for both locally-produced and imported rice. Similarly, income gains to cotton growers are more than offset by income losses to the government from the producer subsidy.

This study was conducted in October-November, 1989 for USAID/Niger under Phase II of the Agricultural Policy Analysis Project (APAP II), as part of the Mission's design of Phase II of its Agricultural Sector Development Grant (ASDG II). The study analyzes the rice and cotton sectors, with particular emphasis on the policy environment, costs of production and efficiency of resource allocation.

Rice and cotton are the two predominant irrigated crops in Niger. The two crops are produced in collectively-managed irrigated perimeters. Most irrigated perimeters are donor-financed. Major donors are the World Bank, the Fonds Europeen de developpement (FED), the Caisse centrale de cooperation economique (CCCE), the German Development Agency KFW, and Kuwait. Japan is also emerging as a potentially important donor.

Even though rice in Niger represents approximately 3 percent of total cereal production and ranks lowest among all cereal crops in terms of area planted, it is, by far, the predominant crop in Nigerien irrigated agriculture. Cotton is a relatively minor crop in terms of total area planted (an average of less than 6,000 hectares have been planted in cotton since 1980), and as a percentage of total irrigated crops (cotton has occupied less than one-fifth of total irrigated area).

Rice production has averaged 60 percent of total rice supply since 1981. Irrigated rice has represented 70 percent of total rice production since 1981 and more than 75 percent since 1985, following rehabilitation of several irrigated perimeters. Although production has fluctuated between less than 2 percent and more than 4 percent of total cereal production, this share has shown an increasing trend in recent years.

Cotton production in Niger is of three types: irrigated, rainfed and flood recession production. Irrigated cotton, representing approximately one-third of total production, yields 1.8-3 mt/ha. Rainfed cotton yields are low (0.7 mt/ha on average) and fluctuate widely (0.3 mt/ha-2 mt/ha). Yields in flood recession areas hardly exceed 1 mt/ha, but may be as low as 0.1 mt/ha.

Rice and cotton farmers are organized into cooperatives. The cooperative is responsible for collection of a redevance or user fee from each farmer to cover collective services such as the upkeep and maintenance of irrigation pumps. To pay their fees, rice farmers sell part of their paddy harvest through the cooperative to the state company Riz du Niger (RINI). Approximately one-third of total rice production is sold through private channels. Private traders are also very active in the rice import market.

In addition to procurement and distribution of cotton seed and insecticides at no cost to farmers, the Caisse de stabilisation et perequation du Niger (CSPPN) finances cotton purchases and cooperative marketing expenses. Cotton processed at the Compagnie Francaise pour le developpement des fibres textiles (CFDT) Madaoua factory is then sold to the state enterprise Societe Nigerienne des textiles (SONITEXTIL) or exported. Under present arrangements, CFDT does not run any commercial risk, for all processing and export costs are refunded to CFDT from CSPPN funds.

In contrast with millet and sorghum prices which were liberalized in 1984-1985, a guaranteed official producer price is still in effect in both the rice and cotton sectors. Due to the Taxe de perequation or price-parity tax and the import tariff, free-market prices of rice -ignoring seasonality and marketing costs- have been in line with official prices. Since 1988, CSPPN has purchased cottonseed from farmers at the guaranteed price. Lint cotton has been exported through CFDT or sold directly to SONITEXTIL. The

difference between sales earnings and marketing and processing expenses has been refunded to CFDT from CSPPN subsidy funds.

The nominal protection coefficients (NPCs), which measure the divergence between the domestic price and its border price equivalent, indicate that domestic prices of both rice and cotton have unambiguously been above border prices. While support to rice farmers has been systematically higher than that provided to cotton producers, incentives to both cotton and rice growers were positive even when international prices reached their highest level (1987 for cotton and 1989 for rice). Due to a reduction in support prices and a simultaneous rise in border prices, distortions in the output market for cotton fell to a minimum in 1987. However, a sharp decline in border prices in 1988 reversed the trend and the distortion remained high despite a new rise in border prices in 1989. Farm incentives in the rice sector remain high, but show a declining trend. It is, nevertheless, important to note that the decline was not due to a decrease in the import tariff (the tariff has, in effect, more than doubled in recent years), but to the steady increase in import-parity prices.

The effective protection coefficients (EPCs), which measure the net effects of domestic economic policy in both the input and output markets, were in general higher than the nominal protection coefficients. The differential reflects the subsidies accorded to farmers on certain inputs such as seed and insecticides. In contrast with rice, EPCs for cotton are characterized by wide variations. This is not a surprising result when input use is characterized, as in cotton production in Niger, by wide variations across regions and farming systems.

Irrigated rice farming is, as a result of the price interventions, a lucrative enterprise. Rice producers earn, on average, a net income of cfa 60,000/ha per cropping season or cfa 120,000/ha per year, where net income is defined as gross income (output times

output price) minus costs, including fixed costs and family labor valued at market wages. Although fluctuating widely over time and across farming systems, net returns to cotton growers have been positive in most years. When output and all inputs are valued at their opportunity cost, net returns become negative in nearly all perimeters and for all farming systems in both sectors. Factors contributing to this shift include the input subsidy and the discrepancy between domestic and border prices.

Support prices were introduced in Niger to stimulate production, reduce foreign exchange outlays on rice imports, increase foreign exchange earnings from cotton exports, while raising agricultural income in both sectors. However, such intervention reduces national income, for income gains to rice producers and income gains to the government from the import tariff are more than offset by income losses to consumers who pay higher prices for both domestic and imported rice. Similarly, income gains to cotton growers are more than offset by income losses to the government from the producer subsidy.

Gains to producers under current policies range from cfa 0.8 billion to more than cfa 1 billion, depending on the parameters considered. Losses to consumers range between cfa 5 billion to more than cfa 7 billion. Losses to consumers in excess of gains to producers and the government or, equivalently, the net social loss from present price interventions, range from cfa 223 million to cfa 2.5 billion. Gains to cotton growers are estimated at cfa 200 million to cfa 2 billion and, taking present government subsidies into account, net welfare losses from cotton price distortions are estimated at cfa 6 million to more than cfa 200 million. It is important to note that removal of the support price would cause rice production to decline by an estimated 10,000 mt per year or approximately 20 percent of average production in recent years. Similarly, cotton market liberalization would be accompanied by a

drop in production estimated at 1,000 mt or approximately 15 percent of current production.

Income transfer inefficiency or the loss in national income per cfa transferred to producers range from cfa 0.2 to cfa 3.0 for rice and from cfa 0.02 and cfa 0.2 for cotton. While the relative efficiency of the current transfer mechanism is apparent, a comparison with other more efficient transfer mechanisms may be useful. For instance, public investment in production or marketing infrastructure such as a more efficient irrigation network or improved roads might increase national income per cfa transferred to producers. A quantitative and/or qualitative increase in extension personnel might yield similar results.

1.0. INTRODUCTION

This study was conducted for USAID/Niamey under Phase II of the Agricultural Policy Analysis Project (APAP II), as part of the Mission's design of Phase II of its Agricultural Sector Development Grant (ASDG II). The study analyzes the rice and cotton sectors in Niger, with particular emphasis on the policy environment, costs of production and efficiency of resource allocation.

The study team, consisting of an Agricultural Economist and an Agronomist/Agricultural Economist, visited Niger in October-November, 1989. During this period, they reviewed existing documents and previous studies, collected data and met with various Nigerien officials and representatives of international organizations. The information obtained in Niamey was analyzed during the same period. An initial presentation of the results was made in November to USAID/Niger, selected Nigerien officials and representatives of major donors in preparation for the final report.

Specific objectives of this study are to:

1. review government and donors' strategies toward rice and cotton production, pricing and marketing;

2. examine public management of the irrigated perimeters, including the financial arrangements between producers and the state irrigation agency;

3. prepare estimates of the costs of production in both sectors in financial and economic prices;

4. assess competitiveness of local rice and cotton with imports; and

5. estimate the economic costs and benefits of current policies in the two sectors.

The report is organized into seven chapters and eight technical annexes. Following the introductory material in this section, production, demand and organization of the marketing system are described in Chapters 2-4. The policy environment is reviewed in Chapter 5. The review examines management of the irrigated perimeters, and pricing policies in both the commodity and input markets. A key area of analysis in this study is the incentive structure resulting from current policy interventions. Incentives to farmers as well as competitiveness of local production with imported commodities are assessed in Chapter 6 through a detailed analysis of costs of production, nominal protection and effective protection. Chapter 7 estimates the economic effects of present policies on producers, consumers and the nation. Technical annexes contain detailed data used in the analysis and describe the methodology utilized to derive the results summarized in the main report.

2.0. PRODUCTION ANALYSIS

The agricultural sector in Niger accounts for approximately 90 percent of employment and 40-50 percent of GDP. Cultivable land represents only 15 percent of total land area. Cropped area does not exceed 25 percent of cultivable land. Less than 10 million ha or 60 percent of cultivable land is maintained in rotational fallow and pastures.

More than 60 percent of the territory is located in the Saharan zone and receives less than 200 mm of rainfall. Almost all of the productive agricultural land is located in the Southern belt, within 150 km of the Nigerian border. The Southern belt, with a higher rainfall and a higher population density accounts for nearly all production of agricultural crops and most of livestock production. Outside of the Southern zone, soil resources are too poor and the rainfall too low or too irregular for farming.

Only 4 percent of arable land or 61,000 ha are identified as potentially irrigable, of which 20 percent or 13,000 ha are under the management of the state irrigation agency ONAHA. The agricultural production unit outside the irrigated areas is a small family-cultivated plot, where rainfed, drought-resistant crops such as millet and cowpeas are cultivated using traditional farming methods.

Even though rice represents approximately 3 percent of total cereal production and ranks lowest among all cereal crops in terms of area planted, it has been a predominant crop in Nigerien irrigated agriculture. Cotton is a relatively minor crop in terms of total area planted (an average of less than 6,000 hectares have been planted in cotton since 1980), and as a percentage of total irrigated crops (cotton has occupied less than one-fifth of total irrigated area).

2.1. Rice Production

Rice is produced along the Niger River. Traditional farming is found in depressions (bas-fonds) along the river and includes the flood plains adjacent to it. Irrigated rice farming is located in larger depressions (cuvettes) and flood plains generally covering 100-400 ha, but exceeding 1,000 ha in certain cases. Jointly-managed river pumping systems permit control of water with dikes controlling inflow during the flood season and pumps providing water during the dry or low-water season. Most of the river pumping systems produce a double crop of rice harvested in December-January (the saison d'hivernage or rainy season harvest) and in May-June (the saison seche or dry season harvest).

While adequate levels of fertilizer are generally applied, insecticides and pesticides are used only in the case of an outbreak. Insufficient insecticide and pesticide application together with continual double cropping of rice and the resulting difficulties in controlling diseases once they occur are two major determinants of the increasing problems with bacterial and viral diseases in certain perimeters. Although insect diseases may account for yield differentials between seasons, the most important factor explaining the lower yields obtained in the rainy season appears to be the cooler drier weather prevailing in November during the critical flowering stage. Competition for labor with dry land crops is also a major factor explaining yield differentials between the rainy and dry seasons. In effect, farmers plant their traditional millet crop outside the irrigated perimeters in May-June. At the end of May, they begin harvesting the dry season rice crop and preparing the rice nursery. These operations are followed by preparation of fields for the second rice crop, weeding traditional cereal crops, and planting then weeding the second rice crop.

As shown in Table 2.1.1, irrigated rice has represented about 70 percent of total rice production since 1981 and more than 75 percent since 1984 following rehabilitation of several irrigated perimeters. This share exceeded 79 percent in 1985 and 1986 and rose as high as 87 percent in 1987.

Niger has produced on average 50,000 mt of rice paddy since 1981 (Table 2.1.2). Total production has fluctuated between 75,000 mt and 30,000 mt per year depending on weather conditions affecting traditional rice farming and the magnitude of the rehabilitation efforts undertaken in certain irrigated perimeters in a given year. Even though rice production has fluctuated between 1.7 percent and 4.5 percent of total cereal production, this share has shown an increasing trend in recent years.

Yields for irrigated rice have averaged approximately 4 mt/ha since 1981, and have significantly exceeded this average in the last four years. Yields in traditional rice farming have oscillated between 0.8 mt/ha and more than 1.5 mt/ ha, but have been consistently and substantially (two to five times) lower than those obtained in the irrigated perimeters.

2.2. Cotton Production

Cotton production in Niger is of three types: irrigated, rainfed and flood recession production. Irrigated cotton, representing approximately one-third of total production, is prevalent in the Maradi and Tahoua departments. It is planted in June-July and yields 1.8 mt/ha to 3 mt/ha. Rainfed cotton is produced in Tahoua, Maradi and Dosso. While rainfall in Dosso (Gaya) is sufficiently high to ensure a successful cotton crop, flood water is often

Table 2.1.1. Rice Production by Farming system in Niger, 1981-1988.

	Total	Irrigated Perimeters	
	mt (000)	mt (000)	% of Total
1981	29.9	18.5	62.0
1982	38.9	18.5	47.6
1983	41.2	22.6	54.8
1984	44.8	35.2	78.6
1985	48.5	42.2	86.9
1986	56.7	44.9	79.1
1987	75.5	47.5	63.0
1988	61.4	42.9	69.8
Average	49.6	34.0	67.7

Sources: Maliki, Jan. 1989 and ONAHA

Table 2.1.2. Rice Production and Yields in Niger, 1981-1988

	Total Cereals	Rice			
		Paddy	% of Total Cereals	Yield Irrig.	Yield Tradit.
	mt(000)	mt(000)	%	kg/ha	
1981	1741.5	29.9	1.7	3990	883
1982	1635.5	38.9	2.3	2865	1243
1983	1659.9	41.2	2.4	3145	1629
1984	1675.1	44.8	2.6	3910	1296
1985	1033.1	48.5	4.5	4214	1375
1986	1779.7	56.7	3.1	4361	1772
1987	1755.7	75.5	4.1	4695	1115
1988	1380.5	61.4	4.3	4290	839
Aver.	1582.6	49.6	3.1	3934	1269

Sources: (1) Production: Maliki, Jan. 1989.
(2) Yield: ONAHA, Statistiques de base des AHA. GON/FAO, July 1989.

necessary to supplement available rainfall (less than 500 mm) in Tahoua and Maradi. Rainfed cotton is planted in June-July, but planting may continue during late July into August due to delays in the arrival of the rain and to variations in rainfall intensity. Rainfed cotton yields are characterized by their low levels (0.7 mt/ha on average) and their wide variations (0.3 mt/ha-2 mt/ha). Flood recession production is prevalent in Tahoua and Maradi. Cotton is planted in flood recession areas in late July, but planting may continue during late September depending on flood conditions and timeliness of rainfall. Yields in these areas can be as low as 0.1 mt/ha, but hardly exceed 1 mt/ha.

Average cotton production and yields are presented in Table 2.2.1. Between 1975-1976 and 1981-1982 cotton production declined from more than 11,000 mt to less than 2,000 mt, reflecting not only a contraction in area cultivated (from 15,000 ha to 2,000 ha), but also the effects of insect infestation and adverse weather conditions. In 1983, a Cotton Development Program was launched to stimulate production through higher producer prices and free insecticides. As a result of the program, area planted increased from 1,700 ha in 1982-1983 to 11,900 ha in 1987-1988 with production rising from 2,000 mt to 8,600 mt during the same period. However, yields remained, on average, constant. It is worth noting that these yields have been consistently and, in certain years, substantially below those obtained in other West African countries.

Table 2.2.1. Cotton Production and Yield in Niger, 1980-81/1988-89

	Production		Yield			
	Cottonseed		Cottonseed		Lint Cotton	
	Niger	W.Africa	Niger	W.Africa	Niger	W.Africa
	mt		kg/ha		kg/ha	
1980/81	2852	354671	674	947	275	366
1981/82	1791	353409	854	1067	349	424
1982/83	2009	436729	1198	1166	478	467
1983/84	3982	421317	1035	1080	406	426
1984/85	3884	550019	839	1262	319	504
1985/86	4389	576141	797	1141	314	465
1986/87	8138	698502	864	1310	334	534
1987/88	8613	717512	749	1182	291	484
1988/89	5910	828300	667	1184	306	485
Average	4619	548511	853	1149	341	462

Source: CFDT, 1988

3.0. DEMAND ANALYSIS

3.1. The Rice Sector

Knowledgeable observers and informal surveys estimate on-farm consumption of rice in Niger at 37 percent or one-third of total production. Rice Imports are of two types: commercial and foreign aid. Total imports have, on average, exceeded 60 percent of total rice supplies, but have fluctuated widely, ranging from 30-40 percent in 1987-1988 to 75-80 percent in 1981-1982 (Table 3.1.1.). Foreign aid has been characterized by even wider swings. Foreign aid imports have approached or exceeded commercial imports in certain years, but have amounted to only 1 percent of commercial imports in 1980 and to 20 percent in more recent years. Such variations may be explained by the size of the total cereal harvest in a given year, but also, and perhaps more importantly, by data unreliability due to fluctuations in underinvoicing and unrecorded trade.

From the foregoing and other figures, rice consumption in Niger may be estimated at 15 kg/capita per annum. However, in a formal survey conducted by the UNDP in 1986 (Project PNUD/NER/81/009), per capita rice consumption was estimated at 41 kg in urban areas, 28 kg in rural areas, and 18 kg for the nomadic population. Given that consumption survey data are in most African countries more reliable than trade data, the discrepancies may be explained by unrecorded trade and leaks from transit rice imports.

3.2. The Cotton Sector

Niger has produced less than 2,000 mt of lint cotton per year since 1980, although this average approached 3,000 mt per year in the last three years. Approximately one-third of cotton production is sold to the local parastatal textile company, Societe Nigerienne des Textiles (SONITEXTIL) and two-thirds are exported. It is

Table 3.1.1. Rice Production and Official Rice Imports in Niger, 1981-1988.

	Production (Milled-Rice Equivalent)	Official Imports	
	mt(000)	mt(000)	% of Supply
1981	19.7	75.1	79.2
1982	25.7	82.4	76.2
1983	27.2	26.8	49.6
1984	29.6	82.0	73.5
1985	32.0	86.1	72.9
1986	37.4	33.8	47.4
1987	49.8	26.7	34.9
1988	40.5	65.2	38.3
Average	32.8	58.1	61.2

Note: Milled-rice equivalent was calculated using a 0.65 processing ratio.

Sources: (1) for 1981-1987, Maliki B.
(2) for 1988, Comite de suivi de la filiere rizicole.

important to stress that SONITEXTIL whose demand for cotton exceeds local production imports large quantities of lint cotton from Benin, Burkina Faso and Mali. Not required to satisfy all its needs from local production, the company has elected to import higher quality cotton from neighboring countries.

Low quality of lint cotton in Niger is due to several factors, including insufficient and/or untimely use of pesticides and other chemicals. It also stems from damage to fibers left too long in the fields, and inappropriate storage at the farm level. Official prices are announced each year for first-, second- and third-grade cotton. Classification is based solely on the delivery date and no closing date is defined for the marketing campaign. All cotton delivered during the first phase of the campaign is classified as first-grade cotton regardless of quality. Furthermore, significant amounts of low-quality cotton are reportedly imported from Nigeria and resold by certain cooperative presidents at the lucrative official price. No sorting is done at the cooperative level before cotton is shipped to the factory in Madaoua.

4.0. SYSTEM ORGANIZATION

4.1. The Rice Sector

As depicted in Figure 4.1, the rice Market in Niger is characterized by a multiplicity of actors, including producers, importers, cooperatives, three parastatal companies (RINI, COPRO-NIGER and OPVN), wholesalers, semi-wholesalers, retailers and consumers. There are four marketing channels comprised of the local private channel, the local official channel, the private import channel, and the official import channel.

The local private channel concerns rice production sold to consumers at the village level either directly or via the retail market. In the local official channel, rice is sold to RINI through the cooperatives. Rice milled by RINI is sold to consumers either directly, or indirectly via private channels (semi-wholesalers and retailers) or via COPRO-NIGER and OPVN. Foreign-aid import channels are the same as those followed by RINI milled rice. Commercial imports either follow the RINI milled rice channel or are sold to final consumers through wholesalers and retailers.

4.1.1. Producers

Producers are the most numerous participants in the domestic rice market. On-farm consumption in Niger is estimated at one-third of total production. One-half of the remaining two-thirds is sold to RINI through the cooperatives and the other half is sold directly to consumers in rural markets.

Rice Marketing Channels in Niger

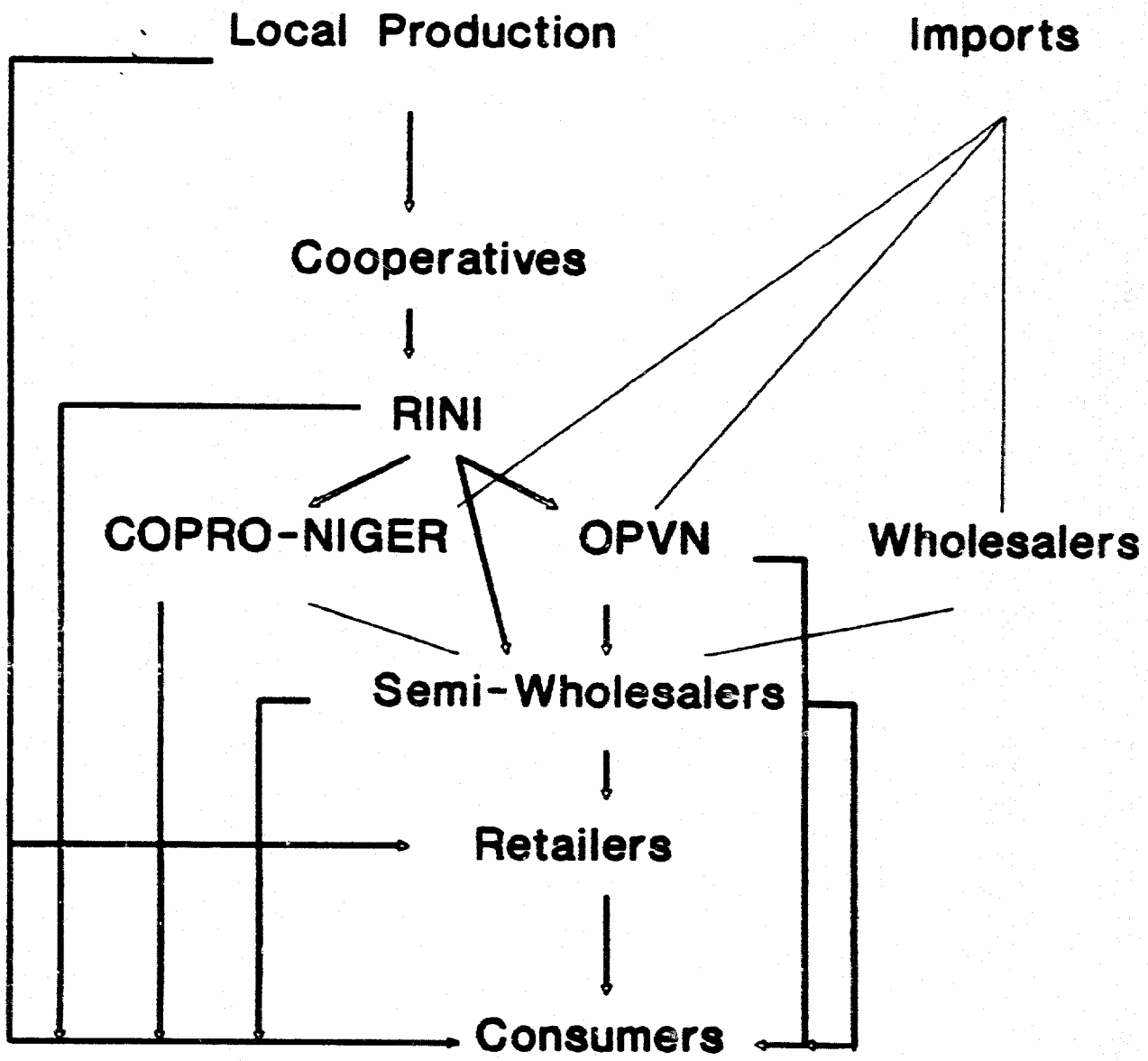

Figure 4.1

4.1.2. Cooperatives

As will be explained in greater detail in Section 5.1.2 below, farmers are organized into cooperatives. The cooperative is responsible for collection of a redevance or user fee from each farmer to cover collective services such as the upkeep and maintenance of irrigation pumps. To pay their fees, farmers sell paddy through the cooperative to RINI. An estimated one-third of total rice production is marketed by the cooperatives each year.

4.1.3. ONAHA

The principal functions of the Office national des amenagements hydro-agricoles (ONAHA) has been to (1) implement, manage and maintain the irrigated perimeters, (2) supply inputs to farmers, and (3) provide extension services. ONAHA is represented in each perimeters by an agent who serves as a resource person for the farmers in the perimeters. ONAHA receives a percentage of the user fee (see 4.1.2.) for its services.

4.1.4. RINI

The Riz du Niger (RINI) is a parastatal company involved in paddy purchases and processing, and sales of domestic milled rice. RINI purchases paddy at the official price through the cooperatives and sells processed rice to the OPVN, COPRO-NIGER, traders or directly to consumers.

4.1.5. OPVN

The Office des produits vivriers du Niger (OPVN) is a parastatal grain marketing company. It had a legal monopoly on rice purchases from RINI until 1984 when the grain market was liberalized. OPVN involvement in the domestic rice market has been nonexistent in recent years, except in 1987-1988 when less than 2,000 mt were

purchased from RINI. Even though the OPVN continues to handle most foreign aid imports, its importance in the rice import market has also been declining.

4.1.6. COPRO-NIGER

COPRO-NIGER is a semi-public import and distribution company which had until 1985 a legal monopoly on the imports of a wide array of essential consumer goods such as milk, tea, sugar, flour, cigarettes and textiles. Although COPRO-NIGER entered the rice market only in 1986, it has played an increasingly important role in both the domestic and import markets since that year. While its purchases from RINI amounted to only 2,556 mt in 1986, they rose to approximately 17,000 mt in 1987 and more than 11,000 mt in 1988. Its rice imports have also increased from 8,000 mt in 1986 to 15,000 mt in 1987 and 22,000 mt in 1988.

4.1.7. Private Traders

Private importers/wholesalers have a storage capacity ranging from several hundred to several thousand tons and their rice import operations vary from 500 mt to 5,000 mt per shipment. Semi-wholesalers are intermediaries who regulate rice flows between wholesalers and retailers. Their storage capacity range from less than 10 mt to more than 500 mt, and are important actors in both the domestic and import markets. Retailers, usually located in stalls in marketplaces, sell rice by the kg or other local units. The retail trade is characterized by a multiplicity of actors due to the small amount of capital required to enter the market and the lack of alternative employment opportunities.

4.2. The Cotton Sector

As summarized in Figure 4.2, the cotton marketing system is comprised of a local channel involving five actors or groups of actors (producers, cooperatives, CSPPN, CFDT and SONITEXTIL) and an import channel involving a single actor (SONITEXTIL). Since cotton production and marketing at the cooperative level are similar to those encountered in the rice sector, description of the main actors and their role in the cotton marketing system will be limited to CSPPN, CFDT and SONITEXTIL.

4.2.1. CSPPN

In addition to procurement and distribution of cotton seed and insecticides at no cost to farmers, the Caisse de stabilisation des prix et perequation du Niger (CSPPN) finances cotton purchases and cooperative marketing expenses. Funds generally obtained from the Banque de developpement de la Republique du Niger (BDRN) are placed at the disposition of local political officials (the Prefects) who remit them to cooperative authorities for cotton purchases and marketing. Cotton processed at the CFDT Madaoua factory is then sold to SONITEXTIL or exported.

4.2.2. CFDT

Prior to 1986-1987, the Campagnie Francaise pour le developpement des fibres textiles (CFDT), a specialized French cotton company, was active in cotton production and domestic marketing in Niger. CFDT activities are currently restricted to cotton processing and exports. Cotton is ginned in the Madaoua factory which it owns and manages. Lint cotton is either sold to SONITEXTIL or exported. CFDT acts, under present arrangements, as a "service company" and does not run any commercial risk, for all processing and export costs are refunded to CFDT from CSPPN funds.

Cotton Marketing Channels in Niger

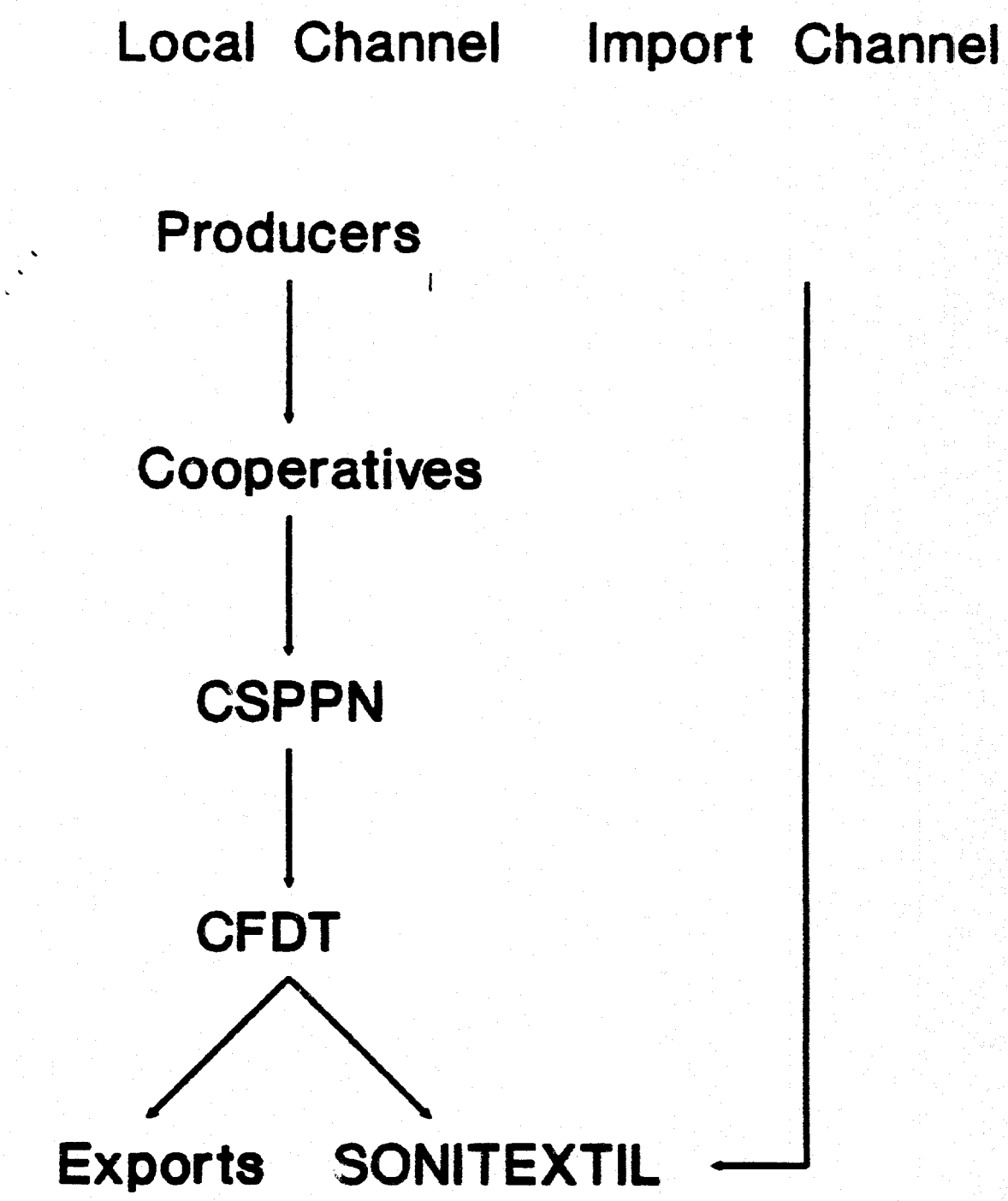

Figure 4.2

4.2.3. SONITEXTIL

The Societe Nigerienne des textiles (SONITEXTIL) is a state enterprise with monopoly power on the domestic dyed-cloth market. It should be noted that although SONITEXTIL has, since 1983, bought cotton lint from the GON at world prices adjusted for transport and other costs (frais non-exposes), the company is under no legal obligation to purchase its raw material in the domestic market. SONITEXTIL domestic purchases have covered, on average, one-half of its total needs and one-third of total domestic production. The state company has elected to import part of the raw material it uses from neighboring Benin, Burkina Faso and Mali because of the lower quality of Nigerien cotton.

5.0. THE POLICY ENVIRONMENT

5.1. Management of the Irrigated Perimeters

The vast majority of Nigerien agriculture is rainfed. Irrigated agricultural production has, however, been significantly extended in recent years, reflecting GON and donors' view that irrigated agriculture is crucial to the country's ability to feed itself over the longer run.

As detailed in Table 5.1. below, Niger has implemented construction and rehabilitation of more than 12,000 ha of irrigated land in over 40 different locations since 1965. More than 10 other perimeters averaging 600-700 ha each are being constructed or rehabilitated, and plans for over 11,000 ha of irrigated land are being considered. Over the next few years, available land under irrigation will cover approximately 30,000 ha.

There are five predominant types of irrigation in Niger (Anders, et. al., 1984): (1) jointly-managed river pumping systems producing a double crop of rice; (2) jointly-managed surface dam systems used primarily for supplemental irrigation of rainy season crops, although limited areas are cropped during the dry season, depending on the amount of water remaining in the reservoir. Rainy season crops are divided equally between cotton and sorghum while dry season crops are more varied and include vegetables and a large area in fallow; (3) jointly-managed ground water pumping systems where cotton and sorghum are planted in equal shares during the rainy season and where peanuts and vegetables dominate dry season cropping systems; (4) individually-managed micro-irrigation systems generally used to produce high-value garden products, although in some areas cereals -excluding rice- are also important; and (5) uncontrolled recession and flood agriculture, producing rice, cotton and other cereal crops.

Table 5.1. Irrigated Perimeters in Niger.

1. Implemented

Perimeter Site	Area (ha)	Year	Financing Institute	Main Crop
CDA Diffa	160		N.A.	Rice, Sorghum
Daibery	310	1987	FED	Rice
Daikena	110	N.A.	N.A.	N.A.
Dembou	400	1989	BOAD	Forage
Djiratawa	520	1981	IDA/CCCE	Cotton, Sorg., Veg.
Firgoun	110	1978	N.A.	Rice
Gabou Bonfeba	889	1990	Italy	Various Crops
Galmi	250	1983	KFW	Cotton, Sorg., Veg.
Ibohamane	611	1967	FAC	Cotton, Sorg., Mil.
Karaigourou	145	76/85	FED	Rice
Karma	150	71-72/83	FED	Rice
Kawara	52	1968	FAC	Cotton, Millet
Kirkissoye	100	1965	FAC-FNI	Rice
Kokomani	45	1975	FAC	Rice
Konni I	1,320	80/85	Kuwait	Cotton, Sorghum
Konni II	1,080	80/85	Kuwait	Cotton, Sorghum
Kourani Baria	390	1988	BAD	Rice
Kourtere	20	70/85	Priv./Belg.	Rice
Koutoukale	410	1966	FED	Rice
Lada	52	N.A.	N.A.	Sorghum, Green Pepper
Libore	250	1977	China	Rice
Lossa	190	1975	FAC	Rice
Moulela	62	1967	FAC	Cotton, Sorg., Mil.
Namarde Goungo	256	1983	FED	Rice
Narmari-Goungou	1,500	1981	IBRD	Rice
N'Dounga 1	280	1977	China	Rice
N'Dounga 2	280	1978	China	Rice
Saadia Amount	115	1973	Lybia	Rice
Saadia Aval	24	1986	Belgium	Rice (Seed)
Saga	385	1969	Formose	Rice
Sakoira	42	1966	FAC-FNI	Rice
Say	300	1980	Belgium	Rice
Say Extention	150	1989	Belgium	Rice
Seberi	430	1980	China	Rice
Sona	167	1975	FAC	Rice
Sona Terrasse	39	70/75	FAC	Various Crops

Table 5.1. - Continued

Perimeter Site	Area (ha)	Year	Financing Institute	Main Crop
Tam	25	N.A.	N.A.	Green Pepper
Tara	100	1978	Africare	Rice
Tiagirire Amt	220	1978	KFW	Forage
Tiagirire Avl	180	1978	FAC	Rice
Tillakeina	68	1967	FED	Vegetables
Tillakeina Ext	15	1983	FED	Vegetables
Toula	250	1975	FED	Rice
Tounfafi	24	1968	FAC	Cotton, Millet
Yelewani	118	1984	BOAD	Rice
Sub-total	12,574			

2. Underway

Perimeter Site	Area (ha)	Financing Institute	Main Crop
Gatawani	3,800	FAC/CCCE	N.A.
Bonfeba Fala	522	FED	Rice
Dessa	208	FED	Rice
Diomana	740	FED	Rice
Firgoun Sud	150	USAID	Various Crops
Kourani Baria	330	BAD	Rice
Gaya Amount	250	China	Various Crops
Goudel	80	STABEX	Various Crops
Kirtachi	400	FED	Rice
Lata	246	FED	Rice
Sakoira	72	KFW	Various Crops
Sub-total	6,798		

Table 5.1. - End

3. Planned

Perimeter Site	Area (ha)	Financing Institute	Main Crop
Ile Maloum	500	Korea/FED	Rice
Balati	150	N.A.	Rice
Kaoura Abdou	650	BADEA	Various Crops
Kizamou	15	BOAD	Various Crops
Koulou	3,800	BOAD	Various Crops
Koutoumbou	30	BOAD	Various Crops
Ouna Kouanza	847	Japan	Various Crops
Terrasse Sia	5,000	Japan	Various Crops
Yelou	45	BOAD	Various Crops
Sub-total	11,037		

Notes: 1. N.A. = information cold not be obtained.
2. For a list of acronyms used in the table, see glossary.

Sources: (1) Anders, et.al., 1984.
(2) MAG/E, Bilan d'execution des projets. Mai 89
(3) ONAHA

All irrigated perimeters are jointly managed. Rice and cotton are the predominant irrigated crops. The most important donors are the World Bank, the Fonds Europeen de developpement (FED), the Caisse centrale de developpement economique (CCCE), the German Development Agency Kreditanstalt fuer Wiederaufbau (KFW), and Kuwait. Japan is emerging as a potentially major donor.

The jointly-managed perimeters are set up by the Office national des amenagements hydro-agricoles (ONAHA) with donor financing. Farmers on these perimeters are organized into cooperatives. Each cooperative is headed by an elected president. Elected presidents together with local political officials decide on the allocation of parcels to individual farmers. Farmers cannot sell or lease their parcels. Farmers' claim to their parcels is fairly secure, provided they pay cooperative fees (see below), and they have had, traditionally, no difficulty transferring it to a family member such as son.

The pump sets are nominally owned by the cooperatives. Operation, maintenance, amortization and overhead costs such as salaries of pump station attendants are paid by the cooperative. Although management of the perimeter is theoretically in the hands of the cooperative, most perimeters are in reality managed by an ONAHA official assisted by one or several extention agents who work together with cooperative leaders.

Typically, the cooperative purchases all collectively-used inputs such as energy and fertilizer, seeds and chemicals for nurseries. Individually-used inputs such as fertilizer applied to individual plots, plowing services and farm labor are purchased on the open market by individual farmers, although the cooperative may offer inputs for sale to members. The cooperative is also responsible for the upkeep of infrastructure, including repair and maintenance of pumps. To recover the costs of such services, the cooperative

is responsible for the collection of a redevance or user fee. The user fee is recalculated on a per-hectare basis at the end of each season, taking into account all costs incurred during that season, including extention and management costs.

To pay their redevance, farmers sell part of their harvest through the cooperative to the parastatal rice company Riz du Niger (RINI) or, in the case of cotton, to the Caisse de stabilisation des prix des produits du Niger or Price Stabilization Fund (CSPPN). Prices paid to rice and cotton farmers within this arrangement will be analyzed in the following section.

5.2. Pricing Policies

5.2.1. The Commodity Market

5.2.1.1. Rice

5.2.1.1.1. Price Regulations

In contrast with millet and sorghum prices which were liberalized in 1984-1985, an official producer price is still in effect in the rice sector. Official producer prices have been traditionally based on cost-of-production data collected by ONAHA. Cost-of-production estimates are determined by input costs, management costs of the irrigated perimeters, and a 5 percent margin to producers. This procedure was followed at least until 1984, a period during which official producer prices increased or remained constant (Table 5.2.1.1). In 1985-1986, rice prices in the international market became so low that RINI, which continued its rice purchases from the cooperatives at the official price, could not compete with imports and was operating well below capacity. When RINI budget deficits reached an unmanageable level, it became clear that a number of decisions had to be taken to overcome the growing difficulties.

Table 5.2.1.1. Official Prices of Paddy, 1980-1988

Year	Producer Price	Cooperatives' Margin	Total
	cfa/kg		
1980	65	2	67
1981	70	2	72
1982	85	3	88
1983	85	5	90
1984	85	5	90
1985	100 - 90 (1)	6 - 5	106-95
1986	90 - 70 (1)	6 - 5	96-75
1987	71.42	5	76.42
1988	71.42	5	76.42

(1) Change in prices during the marketing campaign

Source: RINI

The following is a brief summary of these policy measures:

1. In 1985, producer prices were reduced mid-season from cfa 100/kg to cfa 90/kg. Prices were further reduced to cfa 70/kg in 1986, before they were stabilized at cfa 71/kg in 1987-1988 (Table 5.2.1.1).

2. RINI sold its 1985 rice stocks at a discount ranging from 8 to 20 percent.

3. Rice import licenses were not delivered unless the applicant purchased from RINI an amount equal to 20 percent of his total imports for that year. Mandatory purchases from RINI were, however, later eliminated when the import tariff rate was raised (see 6 below).

4. To control total rice supplies, only 35 import licenses were delivered each year. This restriction was, however, lifted in 1987.

5. A taxe de perequation or price parity tax was levied on rice imports. This tax, which fluctuated between cfa 10,000 and cfa 20,000/mt, was transferred to the CSPPN which in turn passed it on to RINI as either a loan or a grant.

6. A 5 percent import tariff was introduced in 1987. The tariff rate was later raised to 14.33 percent, then to 22.57 percent in April, 1989.

5.2.1.1.2. Price Behavior

Figure 5.2.1 compares open market prices with official prices at the cooperative and farmgate levels[1]. Open market prices typically follow a seasonal pattern, falling to seasonally low levels shortly after the rainy season harvest in December-January, rising steadily until they reach a first peak just before the dry season harvest in May-June, then rising to a second peak in October-November, preceding the next rainy season harvest.

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[1] Official prices are RINI purchase prices. Open market prices are those paid by rural consumers to producers or village retailers. (For more details, refer to Section 4.1 and Figure 4.1).

Rice Prices in Niger
Official & Free Market Prices

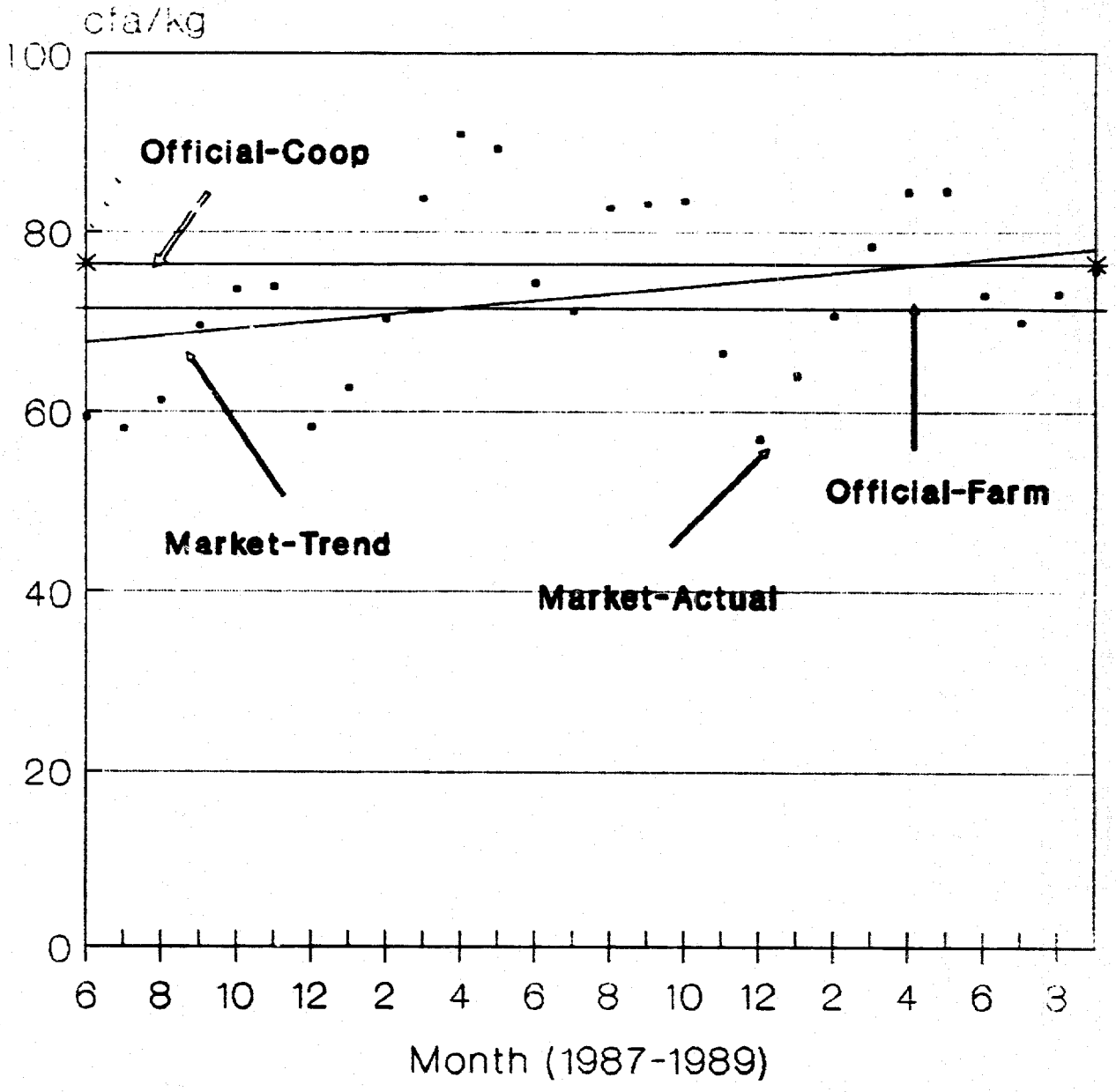

Figure 5.2.1 (Source:ONAHA data)

Owing to the trade restrictions described above, market prices - ignoring seasonal effects and marketing costs- have been in line with official prices. In effect, market prices were, on average, (14 percent) below official producer prices in 1987, and between official prices at the farmgate and cooperative levels in 1988-1989. As apparent in Figure 5.2.1, market prices have also shown a rising trend since 1987. This price rise is, however, a mere reflection of inflation and is not sufficiently high to reflect the increasing degree of protection described in the previous section. The direction of the trend seems, at first glance, in conflict with the steadily falling nominal protection coefficients described in Section 6.2 and Table 6.2.1. As will be explained in Section 6.2 (result 4), this apparent paradox is only due to the steady increase in border prices during the same period. In effect, from the definition of the nominal protection coefficient (Section 6.2.1), a rise in border prices would, ceteris paribus, lead to a fall in this coefficient.

5.2.1.2. Cotton

Similar to rice prices, cotton prices at the farmgate and the cooperative levels are announced at the beginning of each planting season through an official decree emanating from the Ministry of Commerce and the Ministry of Agriculture. These prices are presented in Table 5.2.2.

In 1965-1987, cottonseed was purchased by CFDT from farmers at the official price. Lint cotton was then exported or sold to SONITEXTIL. The difference between sales earnings and all expenses, including processing costs, was refunded to CFDT from CSPPN subsidy funds.

Table 5.2.2. Official Prices of Cotton in Niger, 1980-81/1988-89

	Prices		
	1st Grade	2nd Grade	3rd Grade
	cfa/kg		
1980-1981	62	55	45
1981-1982	80	75	-
1982-1983	120	110	-
1983-1984	120	110	-
1985-1986	120	110	-
1986-1987	130	120	-
1987-1988	130	120	90
1988-1989	110	90	-
1988-1989	100	80	-

- not applicable

Source: Ministry of Commerce, 1987 and CSPPN

Since 1988, CSPPN has purchased cottonseed from farmers while CFDT has been responsible for processing and exports or local sales to SONITEXTIL. CFDT technical and marketing services have been provided on a cost-reimbursement basis. Processing costs have amounted to cfa 30,500/mt, and while export costs have varied according to timing of sales and size of shipment, the export commission has remained constant at cfa 5,000/mt.

Not only have official prices been well above their international price equivalent (see Sections 6-7 and Annex 4), but they have also tended to increase overtime. As depicted in Figure 5.2.2, while international prices have, in general, declined since the early 1980's, official prices have doubled between 1980-1981 and 1986-1987. The price reduction decided in 1987-1988 and 1988-1989 was not sufficiently large to bring domestic prices in line with world prices.

5.2.2. The Input Market

Fertilizer, other agricultural chemicals and energy are, in addition to labor, the most important inputs in rice and cotton production in Niger.

Foreign aid is the major source of fertilizer imports. Since fertilizer is provided by donors at no cost to the GON, and sold by the input distribution agency, the Centrale d'approvisionnement (CA) at a price negotiated between donors and the government, it is tempting to value the economic cost of fertilizer at the negotiated price. However, the price at which the CA sells fertilizer in the market does not reflect the true opportunity cost of this input. The two other candidates for a benchmark economic price of fertilizer are the Nigerian- and international-price equivalents. Although the latter is usually used as an accounting price in economic analysis, most researchers in Niger insist that this reference price is not relevant to the country's economic conditions and suggest the Nigerian-price equivalent as a better alternative. Even though fertilizer is heavily subsidized in Nigeria -it is argued-, the Nigerian-price equivalent is the price at which the free market supplies fertilizer in Niger. If the cost of donor-contributed fertilizer is set at the landed prices of Nigerian fertilizer adjusted for transport and other costs, it must be concluded that fertilizer subsidies in Niger are insignificant to nil (see Development Economics Group, 1989).

Cotton Price Index
Niger Off. Prices-Liverpool Prices

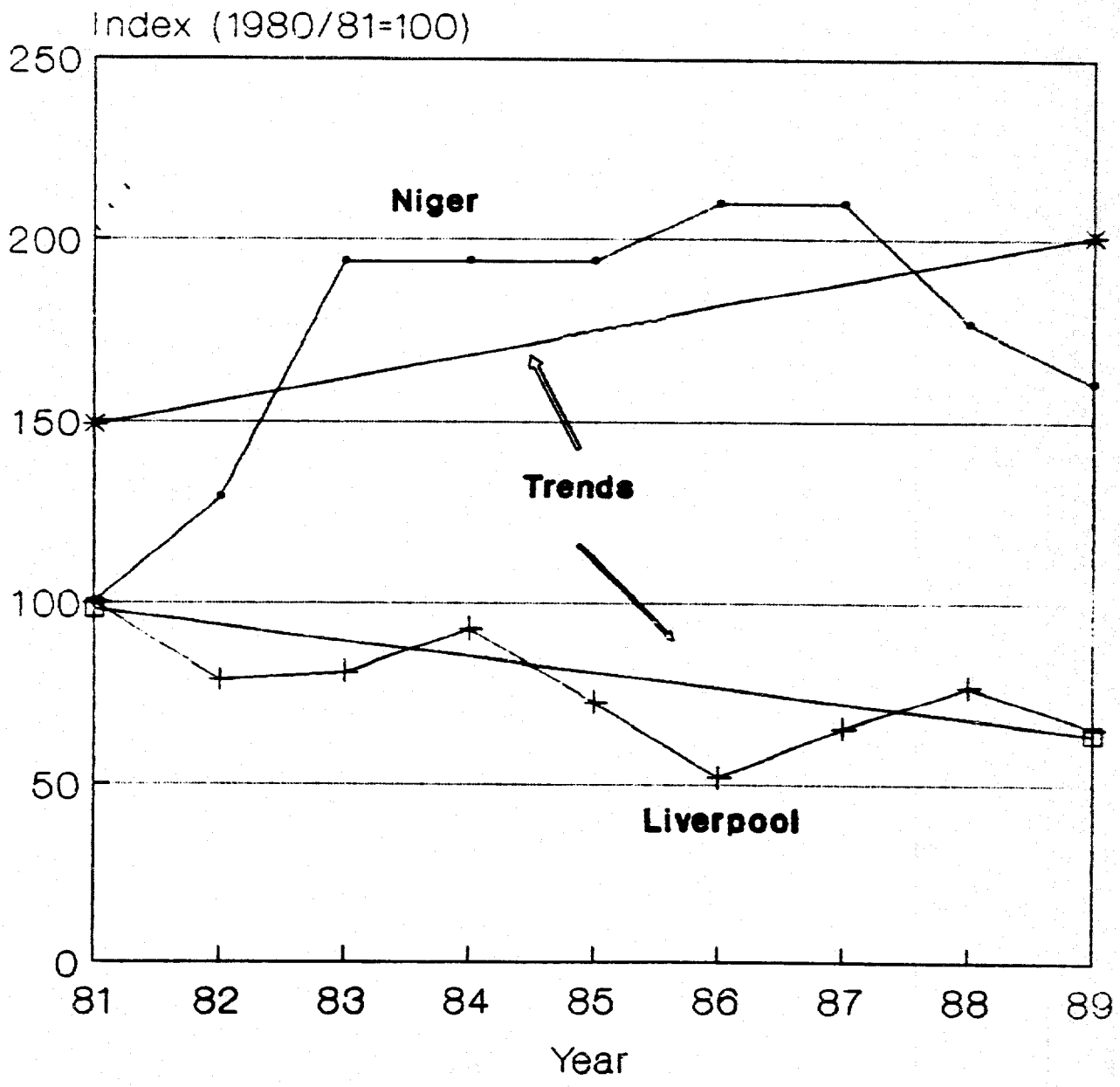

Figure 5.2.2

Even though subsidies on seeds, fungicides and insecticides have been eliminated in recent years for other crops, the GON continues to supply these inputs to cotton growers at no cost. For instance, The CSPPN supplied, in 1988-1989, 614 mt of cotton seed estimated at cfa 9 million. This figure does not include transport costs from the Madaoua factory to cotton production areas.

The CSPPN funds insecticide purchases and delivery from the Fonds national d'investissement or National Investment Fund (FNI) through a tender and bid system. Until 1986, the CA managed the tender and bid system and subsidy allotment. In 1987, these tasks were transferred to the Direction de la protection des vegetaux (DPV) at the Ministry of Agriculture. Despite the high costs of the subsidy (for instance, the CSPPN financed the purchase of 70,000 liters of insecticides at cfa 1,242/liter in 1988), free insecticides are considered essential to the success of the Cotton Development Program.

There are two main sources of energy in the irrigated perimeters in Niger, electricity and diesel fuel. The existing systems for supplying electric power and fuel may be summarized as follows (see Kohler, 1987):

- The river zone or the corridor from Tillabery to Say, along the Niger River, including Niamey. This zone is served by the national electricity grid.

- Ader-Doutche-Magia along an intermittent tributary to the Sokoto River where irrigation is based on retaining seasonal water with dams and using gravity irrigation.

- In the Maradi department diesel pumps and electricity from the local grid are used. The local grid receives power from a diesel generation station in Maradi.

- In Komadougou, near Diffa portable gas and diesel pumps are used.

Studies on energy use in Niger list four main policy conclusions of relevance to irrigated agriculture.

1. Irrigated agriculture is, as it should, treated like any other energy-using sector.

2. The electricity company NIGELEC is the largest consumer of diesel fuel and benefits from a reduced tax on its purchases. While the effective tax rate is 39 percent on premium gasoline and 37 percent on regular gasoline, this rate is only 19 percent on diesel.

3. With the exceptions of the favored tax treatment for diesel fuel and pan-territorial pricing of both diesel and electricity, pricing policies for commercial energy are sensible and do not distort economic incentives.

4. The time-of-day tariff practiced by NIGELEC provides the cooperatives managing the irrigated perimeters with the correct incentives to use electricity during those times of the day when it is cheapest to supply. Unfortunately, the user-fee or redevance system by which individual farmers pay for that energy makes it difficult to pass such incentives on to the actual user.

5.3. Donor Policies

As explained in Section 5.1, irrigated agriculture in Niger has expanded substantially in recent years, reflecting GON and donors view that irrigation is a key to increased agricultural production and self-sufficiency. Rice has been the primary crop in most of the rehabilitated and newly-established perimeters.

Donor participation has focussed on financing the construction or rehabilitation of the irrigated perimeters, and technical assistance. Most of the technical assistance has been provided by the FED and has included long-term advisors both at the regional (perimeter) level and at ONAHA and RINI headquarters in Niamey. Advisors' areas of expertise have included financial management and logistical support, supervision of contracts with local institutions, data collection and analysis, and training of cooperative managers.

In addition to perimeter financing and technical assistance, donors have played a central role in rice policy formulation. Main donors such as the FED and the World Bank have been active members of the monitoring and evaluation committee which assesses progress and determines policy in the rice sector. Donors' role was, for instance, instrumental in eliminating import license restrictions and mandatory purchases from RINI by traders, as well as the introduction of the import tariff and the determination of its level. The World Bank is also investigating schemes that would increase private sector participation in the rice milling industry through the development of small-scale enterprises at the village level. Similarly, the FED has commissioned a report that will study the legal status of the cooperatives and identify alternatives to improve their role and strengthen their management structure.

Interviews conducted by the study team indicate, however, that certain major donors such as the FED and CCCE have overlooked the economic costs of protection and continue to perceive the import tariff as necessary to the development of the domestic rice industry. This perception may explain the absence of well-defined alternative strategies such as more efficient management of the irrigated perimeters, the development of the extension network or the design of a research program to improve productivity and identify other profitable irrigated crops.

Donor participation in the cotton sector is, in contrast, either nonexistent or limited to the financing of perimeters in which cotton is generally a very minor crop. With a few exceptions such as the recent USAID study on the effects of eliminating input subsidies to cotton growers (Casey, 1988; Casey, 1989), the cotton sector in Niger remains -- perhaps due to its limited importance in the economy -- understudied and much less appealing to donors.

6.0. THE INCENTIVE STRUCTURE IN THE RICE AND COTTON SECTORS

6.1. Costs of Production

6.1.1. Rice

Table 6.1.1. summarizes net returns from rice production in six irrigated perimeters: Karaigourou, Namarde, Koutoukale, Karma, Daiberi and Toula in the Niger River Basin in 1988. Net revenue or returns are defined as gross revenue (yield times output price) minus (variable as well as fixed) costs, including family labor valued at market wages. As apparent from the table, irrigated rice farming in Niger is a lucrative enterprise. Rice producers earn economic profit[1] of about cfa 38,000/ha in the rainy season and cfa 82,000/ha in the dry season, for an average approximating cfa 60,000 per cropping season or cfa 120,000 per year. Although family labor may, in certain cases, earn less than market wages in the rainy season, as in Toula where net returns in financial terms are negative, net returns in the dry season are always positive and can be, as in the Karaigourou perimeter, as high as cfa 244,000 per season.

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[1] Economic profit is defined as a pure surplus or the excess of total receipts over all costs of production incurred by the firm. Included as costs are obligations incurred for all resources used equal to what these resources could earn in their next best alternative uses. Assuming perfect competition and the absence of price distortions, the definition implies that the firm's profits are zero since investment in the firm yields the same rate of return as investment elsewhere and all other resources, including labor owned by the operator of the business, are valued at their alternative or opportunity costs. For instance, when output prices are, due to protection, sufficiently high that total receipts exceed total costs of production, we say that the firm is earning economic or pure profit. "Normal profit" is, in contrast, net returns to fixed and variable resources used in their next best alternative uses, that is, the opportunity or alternative costs of all resources used in the production process.

Table 6.1.1. Net Returns from Rice Production in Financial and Economic Prices: Weighted Average for Six Irrigated Perimeters; Dry and Rainy Seasons, 1988

Season	Net Revenue	
	Financial	Economic
	cfa/ha	
Rainy	38,050	-104,500
Dry	81,800	-94,100
W. Average	59,900	-99,400
Range	244,600 -57,200	9,004 -198,100

Source: Annex 1

Economic or pure profit accruing to rice farmers is due to high support prices relative to average production costs. Indeed, while costs of production amounted to cfa 58/kg (see Annex 1), official producer prices were cfa 71/kg or more than 20 percent higher than production costs. Distribution of pure or excess profit among perimeters is mainly due to yield differentials. In 1988, yields ranged between 3,530 kg/ha in Koutoukale in the dry season and 6,927 kg/ha in Karaigourou in the rainy season.

When output and all input prices are valued at their opportunity cost -see Annexes 1, 3 and 4 for details and calculation procedures-, net returns are negative in all perimeters even when family labor is valued at much less than market wages, except in Karma where production costs in the dry season are so low (cfa 32.5/kg) that net returns remain positive (column 3 in Table 6.1.1 above). As apparent in Table 6.1.1, net losses per hectare amount

in economic terms to approximately cfa 100,000 on average and approach cfa 200,000 in certain perimeters.

Table 6.1.2. estimates break-even yields (defined here as those necessary to just recover all variable and fixed costs, including the opportunity cost of family labor) under various output price scenarios. Break-even yields at current support prices (cfa 71/kg) are less than 3,600 kg/ha or 23 percent below present average yields. When output prices are valued at cfa 58/kg (average production costs per kg in 1988), break-even yields approach 4,700 kg/ha, slightly (6 percent) above present yields. However, at cfa 35/kg (the international farmgate price equivalent for 1988 -see Annex 4), Yields would have to reach more than 6,400 kg/ha (a 45 percent increase above current levels) for rice farmers to break even. It is important to note that even though less than 20 percent of farmers obtain at present more than 6,000 kg/ha, moving to a freer trade regime by gradually lowering support prices would reduce social costs and increase economic efficiency in the rice sector (see Section 7 and Annex 7). The forgoing scenarios suggest that lowering support prices to cfa 55-60/kg (a decrease that would just eliminate excess profit) would be a step in this direction.

Table 6.1.2. Break-Even Yields for Rice under Various Output Price Scenarios

Output Price		Break-Even Yields	
Price Level	cfa/kg	kg/ha	Needed Increase above 1988 Yields
Official Price	71	3,588	-23%
Costs of Production	58	4,685	+6%
Border Price	40	6,419	+45%

Sources: calculations using Annexes 1 and 4.

6.1.2. Cotton

Table 6.1.3. summarizes net returns from cotton production under three farming systems: rainfed, recessional and irrigated cotton farming. Net returns (defined as in Section 6.1.1. above) are positive in financial terms in all years and in all regions for which data are available, except for recessional farming in Tahoua in 1987 where slightly negative returns (less than cfa 3,000/ha) can be observed. Net returns are lowest in recessional cotton production and highest under irrigated conditions (Tahoua in 1986 and 1987). Although lower than in irrigated cotton, net returns from rainfed production can be as high as cfa 60,000/ha (Gaya in 1986) and almost as high as returns from irrigated production (Gaya in 1987). Note that, owing to the decrease in support prices (from cfa 130/kg to cfa 100/kg for First Grade cotton) in 1987-1988, returns were lower in 1987 and 1988 than in 1986.

When output and all input prices are valued at their opportunity or economic cost -see Annexes 2 and 4 for details and calculation

procedures-, net returns become negative. Two factors contribute to this shift: (1) Prices obtained by cotton growers have been higher than their international price equivalent (cfa 105/kg vs. cfa 65/kg on average in the last three years - see Annex 4); and (2) certain inputs such as seeds and insecticides have been distributed to farmers at no cost (see Section 5.2).

Table 6.1.3. Net Returns from Cotton Production in Financial and Economic Prices, by Region and Farming System in 1986-88

	Net Revenue					
	1986		1987		1988	
Farming system and Region	Fin.	Econ.	Fin.	Econ.	Fin.	Econ.
	cfa/ha					
Rainfed						
Gaya	60,196	-61,074	28,066	-22,794		
Tahoua	27,016	-40,954	8,116	-18,554		
Recessional						
Tahoua	3,832	-12,418	-2,918	-4,418		
Irrigated						
Tahoua	104,238	-77,154	34,261	-8,629		
Konni					7,500	-88,482
Average	48,820	-47,900	16,881	-13,599	7,500	-88,482

Source: Annex 1

Table 6.1.4. illustrates the effects on farmers' net returns of eliminating subsidies on all inputs (seeds, insecticides and sprayers), by region and farming system. The last three columns in the table indicate that elimination of the subsidy would result in

a pure or economic profit[1] loss ranging approximately between cfa 1,000/ha and cfa 20,000/ha, depending on the farming system considered. The highest loss (cfa 20,000/ha) is equivalent to valuing family labor at 25-30 percent below market wages.

Considering that all family labor - including child and female labor- is valued at full market wages in the farm budgets, these losses do not appear excessive. The above assessment assumes that positive returns to farmers beyond what is necessary to cover all costs represent unearned (i.e., economically unjustified) income. It is evident, however, that income losses incurred by farmers may be, in accounting terms, substantial. For instance, elimination of the subsidies would amount to an income loss of cfa 47,490/ha in Gaya in 1986 and cfa 47,290/ha in 1987.

Table 6.1.4. Net Revenue from Cotton Production with and without Input Subsidies, 1986-1989

	Net Returns in Financial Prices					
	With Input Subsidies			Without Input Subsidies		
	1986	1987	1988	1986	1987	1988
	cfa/ha					
Rainfed						
Gaya	60,196	28,066		12,706	-19,224	
Tahoua	27,017	8,116		2,446	-16,454	
Recessional						
Tahoua	3,832	-2,918		3,082	-3,668	
Irrigated						
Tahoua	104,238	34,261		66,562	-0.889	
Konni			7,500			-20,082

Source: Annex 1.

[1] For a definition of pure or economic profit, see footnote in Section 6.1.1.

Table 6.1.5. estimates yields necessary for cotton growers to just cover their fixed and variable costs, including family labor valued at market wages. Break-even yields at current support prices and input subsidy levels are 28 percent below current yields for irrigated cotton, 22 percent for rainfed cotton and 2 percent for recessional cotton. When output and all inputs are valued at their opportunity cost, farmers would have to increase their yields by more than 30 percent in irrigated production and by 60 percent or higher in rainfed and recessional areas, for an average increase of approximately 50 percent. It is important to note that this is not an insurmountable task since cotton yields in Niger have been more than 50 percent lower than yields obtained in West Africa in recent years (see Section 2).

Table 6.1.5. Break-Even Yields for Cotton under Alternative Price Scenarios: Average for 1986-1988.

	Actual Yield	Break-Even Yield	
	kg/ha	kg/ha	Needed Increase above Current Yield (Percent)
Rainfed	940		
Actual Prices		771	-22
Border Prices		1,567	+67
Recessional	250		
Actual Prices		245	-2
Border Prices		399	+60
Irrigated	2,125		
Actual Prices		1,610	-28
Border Prices		2,888	+36

Source: calculations using Annexes 2 and 4.

6.2. Nominal Protection

6.2.1. Definitions

Nominal Protection measures, for a given commodity, the divergence between its domestic price and its international or border price equivalent. The nominal protection coefficient (NPC) for a commodity is the ratio of its domestic price to its border price equivalent. Domestic output prices are in developing and developed countries alike influenced by a variety of policy instruments such as price support or taxes. Such distortions drive a wedge between domestic and international prices that can be captured by the NPC.

To illustrate the NPC concept, suppose that the import (c.i.f.) price of rice under a free trade regime is cfa 40,000/mt. If a 10 percent import tax (e.g., customs duties and a statistics tax) is levied on rice imports, then the price paid by consumers (ignoring transport and other marketing costs) is 40,000*1.10 = cfa 44,000/mt or cfa 44/kg. Thus, the difference between consumer prices before and after imposition of the tax is

(40,000-44,000)/44,000=0.10 or 10 percent

This rate can equivalently be interpreted as the nominal protection accorded to local rice producers who can now raise their output prices as a result of the higher import price.

While the above example describes, for convenience, only the effect of an import tax, the NPC concept includes all policy decisions, tariff or otherwise (e.g., an import quota or a support price to producers), which prevent equality between domestic prices and their world price equivalents. Thus, the NPC for a given commodity is a summary indicator of all protection or taxation measures accorded to or imposed on that commodity.

Applying the NPC definition to the example described above yields 40,000/44,000 = 1.10, meaning that the price received by farmers after imposition of the tax is 110 percent of the price that would have prevailed under free trade. This result may be generalized as follows:

NPC > 1 means that the domestic price is higher than the border price and implies an implicit subsidy to producers;

NPC < 1 implies that the domestic price is lower than the international price, reflecting an implicit tax on farmers; and

NPC = 1 indicates no price intervention.

To the extent that price distortions have adverse effects on production, consumption and the national economy (see Section 7 and Annex 7), the NPC is also an indicator of economic efficiency. Assuming no externalities or monopolistic behavior, an NPC significantly different from 1 carries a strong presumption that the policy measures prevent the market mechanism from achieving maximum economic efficiency.

For the NPC to be meaningful, care must be taken to compare domestic and border prices in relation to a particular economic agent (e.,g., producers or consumers) and a specific marketing level (e.g., farm, cooperative, wholesale or retail). Since one of the main objectives of this study is to investigate the incentive structure provided to farmers, the relevant domestic price is the price received by producers at the farmgate or the cooperative levels. To obtain a border price, the c.i.f. price must be translated into an international farmgate or cooperative price equivalent.

6.2.2. Results

Tables 6.2.1 and 6.2.2. present NPCs for rice and cotton in 1986-1989 (Detailed calculation procedures to obtain border prices used to derive the NPCs are provided as Annex 4). The main conclusions from the two tables may be summarized as follows:

1. As expected in a situation such as Niger's, where an import tax is levied on rice imports and where two state marketing agencies purchase part or all of the rice and cotton production at a support price (see Section 5.2), domestic prices are unambiguously above border prices for both commodities.

Table 6.2.1. Nominal Protection Coefficients for Rice, 1987-1989

	1987	1988	1989	Average
	cfa/kg			
CIF Niamey	99	116	133	116
Actual Price				
at Cooperative	74	74	74	74
at Farmgate	71	71	71	71
Border Price Equivalent				
at Cooperative	30	38	42	37
at Farmgate	27	35	40	34
NPC	2.63	2.03	1.77	2.14

Note: figures are rounded to the nearest decimal

Source: Annex 4

Table 6.2.2. Nominal Protection Coefficients for Cotton, 1986-1989

	1986	1987	1988	1989	Average
		cfa/kg			
FOB Price	34	44	36	39	38
Actual Price at the Cooper. (weighted avr.)	127	100	92	100	105
Border Price Equivalent	65	97	54	61	69
NPC	1.96	1.03	1.71	1.63	1.58

Note: figures are rounded to the nearest decimal

Source: Annex 4

2. As reflected in the NPCs, support to rice farmers is, both on average and in any given year, higher than that provided to cotton growers.

3. Incentives to both rice and cotton producers were positive even when international prices were highest (1987 for cotton and 1989 for rice).

4. Although farm incentives remain high in the rice sector -farm prices in 1989 are more than 75 percent higher than international prices- these incentives show a declining trend. From a high of 2.63 in 1987, the NPC fell to 2.03 in 1988 and 1.77 in 1989. This decline is due to the fact that farmgate prices have remained constant since 1987 while their international price equivalents showed a steady increase over the same period. Raising the Protective tariff from 10.21 to more than 20 percent in April 1989 did not reverse the trend.

5. As reflected in an NPC approximating unity, distortions in the output market for cotton fell to a minimum in 1987 when support prices were reduced by approximately 30 percent while international prices rose by about 50 percent. However, a sharp decline in border prices in 1988 reversed the trend and the distortions remained high despite a new rise in world prices in 1989.

Even though the NPC is a useful tool that can be used to obtain a preliminary assessment of the incentive structure facing producers, effective protection is a more accurate measure of price incentives.

6.3. Effective Protection

6.3.1. Definitions

Effective protection is a natural extension of the nominal protection concept in that it makes allowance for distortions in the input as well as the output markets. Indeed, it is conceptually easy to envisage a case where output prices are high relative to world prices, but where the disincentives in the input market are so large that the net incentives are negative. Effective protection is, therefore, an attempt to measure the net effect of domestic economic policy in both the output and input markets.

The effective protection coefficient (EPC) is the ratio of value-added in domestic prices to value-added in border prices, where value-added is defined as output price minus the costs of the tradable inputs necessary to produce one unit of output. Tradable inputs are of two types: (1) those which have a recognizable border price (e.g., fuel, fertilizer and insecticides), and (2) the traded components of primarily non-traded inputs (e.g., fuel expenses embodied in the costs of operating a tractor).

To illustrate the EPC concept, assume, as in the NPC example in 6.2.1, that the price of rice is 40,000/mt under free trade, and that the price of the only tradable input necessary to produce it is cfa 10,000, then the value-added in rice production is 40,000-10,000= cfa 30,000. If we introduce intc this free trade situation a 10 percent tariff on rice imports and a 20 percent tax on the tradable input, domestic prices become 40,000*1.10=cfa 44,000 for rice and 10,000*1.2=cfa 12,000 for the input, with a resulting value-added of 44,000-12,000=cfa 32,000. Taking the ratio of value-added with distortions to value-added without distortions (i.e., under free trade) yields 32,000/30,000=1.07 indicating a net incentive to rice producers. More generally,

EPC > 1 implies effective protection or a net incentive to producers;

EPC < 1 indicates effective taxation or a net disincentive to farmers; and

EPC = 1 implies no distortions.

A sharp divergence of the EPC from unity, due to any policy measure that prevents equality between value-added at domestic prices from value-added at border prices, is, as in the NPC (see Section 6.2.1.), an indication that the policy environment does not achieve maximum efficiency.

6.3.2. Results

Details on the calculation procedures utilized in deriving the EPCs for rice by cropping season and perimeter in 1988, and for cotton by region and farming system in 1986-1988 are provided as Annexes 5-6. Tables 6.3.1 and 6.3.2 below present only a summary of the main findings. Five aspects of the results are noteworthy:

1. The EPCs are in general higher than the NPCs (compare with Tables 6.2.1 and 6.2.2). The differential is due to the fact that a number of distortions exist both in favor of producers (e.g., insecticides) and against producers (e.g., fuel), with a net effect reflecting a net subsidy on the input side.

2. The EPCs do not differ significantly from the NPCs for rice, but the difference between the two sets of coefficients is substantial for cotton. This is not a surprising result given that subsidized inputs in the cotton sector represent a higher proportion of production costs.

Table 6.3.1. EPCs for Rice by Perimeter, 1988.

Perimeter	Cropping Season		
	Dry	Rainy	Weighted Average
Karaigourou	2.31	2.55	2.38
Namarde	2.31	2.35	2.33
Koutoukale	2.59	2.48	2.54
Karma	2.21	2.41	2.28
Daiberi	2.48	2.37	2.42
Toula	2.47	2.53	2.49
Weighted Average	2.40	2.44	2.42

Source: Annex 5.

Table 6.3.2. EPCs for Cotton by Region and Farming System, 1986-1988.

Region and Farming System	Year		
	1986	1987	1988
Rainfed			
Gaya	11.49	2.26	
Tahoua	4.64	1.82	
Recessional			
Tahoua	2.08	1.17	
Irrigated			
Tahoua	2.98	1.22	
Konni			2.55
Average	5.29	1.61	2.55

Source: Annex 6.

3. EPCs for rice do not differ significantly across seasons and perimeters, reflecting a homogeneous production system in the Niger River Basin. In contrast, EPCs for cotton show wide variations ranging between 2.8 and 11.49 in 1986, and 1.17 and 2.26 in 1987. This is to be expected when input use is characterized, as in cotton production in Niger, by wide variations across regions and farming systems.

4. As with the NPCS, the EPCs are lower for 1987-1988 than for 1986. The decline is due to the decrease in support prices from cfa 130 in 1986 to cfa 100 in 1987-1988 for First Grade Cotton.

5. A notable limitation should be stressed when examining the results in Table 6.3.2. Cost-of-production data from which the EPCs for rice were derived were based on a survey conducted over a two-year period (Loutte, 1988; Loutte, 1989) and should be accepted with a higher degree of confidence. In contrast, cost-of-production data for cotton were collected from different sources using different research methodologies. Consequently, the estimated EPCs for cotton must be examined with caution and should be taken to represent an order of magnitude rather than an absolute value.

7.0. ESTIMATED ECONOMIC IMPACT OF REMOVING THE SUPPORT PRICE AND/OR THE IMPORT TARIFF

Support Prices were introduced in Niger to reduce foreign exchange outlays on rice imports, increase foreign exchange earnings from cotton exports, and to stimulate local production and raise agricultural income in both sectors. However, this price intervention reduces national income, for income gains to rice producers from the price support and income gains to the government from the protective tariff are more than offset by income losses to consumers who pay higher prices for both locally-produced and imported rice. Similarly, income gains to cotton producers from the price support are more than offset by income losses to the government from subsidies to farmers. Losses and gains to the various marketing agents as well as the net social costs from price interventions in the two sectors will be examined below.

Table 7.1. estimates the benefits of removing the rice support price. Results are based on 1988 figures. Due to data unavailability, low, medium and high estimates are based on computations using alternative supply and demand elasticities (see Annex 7 for detailed results, calculation procedures and conceptual framework). Income gains to consumers from price liberalization range from cfa 5 billion to more than cfa 7 billion. These substantial gains are due to the high tariff presently in effect and the large volumes imported. Losses to producers range from cfa .8 billion to slightly more than cfa 1 billion, depending on the supply elasticity considered. Gains to consumers in excess of losses to producers and the government or the net social gain range from cfa 223 million to cfa 2.5 billion. this net economic gain can be interpreted as the loss in national income resulting from trade intervention or, alternatively, the addition to national income from price liberalization.

The loss in national welfare per cfa transferred to producers as a result of the price intervention measures the relative efficiency of this transfer mechanism. As can be seen in Table 7.1, each cfa transferred to producers reduces national income by cfa 0.21-3.0. Although the relative inefficiency of this transfer mechanism is apparent from these figures, it is useful to examine more efficient transfer methods. For instance, public investment in infrastructure such as more efficient irrigation facilities or an improved road network might increase national income per cfa transferred to producers. A qualitative and/or quantitative increase in extension personnel might yield similar results. A direct payment unrelated to production would have zero transfer inefficiency, ignoring administrative costs.

Rice production in Niger is approximately 50,000 mt, but eliminating the support price would cause a decline in production of 2,000-24,000 mt and more probably about 10,000 mt per year. Imports would, in contrast, increase by 12,000-140,000 mt depending on demand and supply elasticities.

Since the interpretation of welfare analysis from eliminating cotton support prices largely parallels removing rice support prices, only a brief description of the results summarized in Table 7.2. will be presented:

1. Producers would lose between cfa 192 million and slightly more than cfa 2 billion.

2. Taking the reduction in government outlays into account, net social gains would range from cfa 6 million to more than cfa 228 million.

3. Transfer inefficiency, ranging between 0.02 and 0.22, is lower in the cotton sector than in the rice sector.

4. Since cotton in Niger is mainly an export crop, and since SONITEXTIL -the main local consumer- buys, in general, only a small proportion of domestic production, local cotton consumption was omitted from the analysis.

Table 7.1. Impact of Eliminating Rice Support Prices

Item	Estimate*		
	Low	Medium	High
	mt (thousand)		
Incr. in Imports (paddy Equiv.)	12	68	138
Decrease in Production	2	9	24
	cfa (billion)		
Gain to Consumers	5.202	6.092	7.275
Loss to Producers	.834	.929	1.056
Loss to Government		3.923	
Net Social Gain			
Net Social Gain in cfa	.223	1.239	2.517
	cfa		
Net Social Gain per cfa Lost by Producers	.21	1.33	3.02

(*) Low, medium and high estimates are derived using various combinations of supply and demand elasticities (See Technical Annex 7).

Table 7.2. Impact of Eliminating Cotton Support Prices

Item	Estimate*		
	Low	Medium	High
	mt (thousand)		
Decrease in Production	.289	1.313	2.154
	cfa (million)		
Loss to Producers	192	208	228
Decrease in Gov. Subsidy		234	
Net Social Gain			
Net Social Gain in cfa	6	26	42
	cfa		
Net Social Gain per cfa Lost by Producers	.02	.12	.22

(*) Low, medium and low estimates are derived using various combinations of supply and demand elasticities (See Technical Annex 7).

TECHNICAL ANNEXES

ANNEX 1. Cost-of-Production Data for Rice in Financial and Economic Prices, by Perimeter and Cropping Season.

Costs of production for irrigated rice in Niger are summarized in Tables A.1.1-A.1.6 below. The tables were constructed from ONAHA data based on a survey conducted over a two-year period by one of the authors of this report. For details and methodology, see Loutte, 1988 and Loutte, 1989.

Economic price of output is derived in Annex 4. Economic costs are identical to financial costs, except for the user fee (see Section 5.2.2. and Annex 3.

The following definitions and acronyms are used in the tables:

Definitions:

Gross revenue: output times output price.

Net revenue: gross revenue minus (fixed and variable) costs.

Costs: fixed costs are included in the user fee. Variable costs include family labor valued at market wage.

User fee: see Section 2.2. of the main report.

Acronyms:

Karg: Karaigourou
Nmrd: Namarde
Kout: Koutoukale
Karm: Karma
Daib: Daiberi
Toul: Toula

Table A.1.1. Farm Budget for Rice: Rainy Season, 1988.
Financial Prices

	Karg	Nmrd	Kout	Karm	Daib	Toul	Average
	(000 FCFA/ha)						
Family Labor	55.5	76.6	86.3	5.4	75.8	149.0	82.9
Hired Labor	57.7	58.4	42.7	36.3	48.4	102.9	58.6
Fertilizer	4.9	19.0	20.5	20.4	19.4	33.4	20.7
Other costs	13.8	35.7	4.1	7.2	13.6	8.6	13.8
User Fee	111.0	70.5	86.0	51.3	61.1	39.5	68.6
Total	242.9	260.3	239.6	120.7	218.3	333.4	244.7
Tot.Area(ha)	135.87	232.88	303	126.02	295	243.2	1335.9
Yield (kg/ha)	3780	4222	3530	3705	4450	3867	3957.0
Gross Revenue	270.0	301.6	252.1	264.6	317.9	276.2	282.7
Net Revenue	27.1	41.3	12.6	144.0	99.5	-57.2	38.0

Table A.1.2. Farm Budget for Rice: Rainy Season, 1988.
Economic Prices

	Karg	Nmrd	Kout	Karm	Daib	Toul	Average
	(000 FCFA/ha)						
Family Labor	55.5	76.6	86.3	5.4	75.8	149.0	82.9
Hired Labor	57.7	58.4	42.7	36.3	48.4	102.9	58.6
Fertilizer	4.9	19.0	20.5	20.4	19.4	33.4	20.7
Other costs	13.8	35.7	4.1	7.2	13.6	8.6	13.8
User Fee	107.8	66.4	81.6	51.3	61.1	39.5	67.0
Total	239.7	256.1	235.2	120.7	218.3	333.4	243.0
Tot.Area(ha)	135.87	232.88	303	126.02	295	243.2	1335.9
Yield (kg/ha)	3780	4222	3530	3705	4450	3867	3957.0
Gross Revenue	132.3	147.8	123.6	129.7	155.8	135.3	138.5
Net Revenue	-107.4	-108.3	-111.6	9.0	-62.6	-198.1	-104.5

Table A.1.3. Farm Budgets for Rice: Dry Season 88.
Financial Prices

	Karg	Nmrd	Kout	Karm	Daib	Toul	Average
	(000 FCFA/ha)						
Family Labor	39.8	54.8	108.0	169.5	97.5	133.5	99.9
Hired Labor	78.6	46.9	56.7	56.6	55.0	75.4	60.2
Fertilizer	2.7	28.9	19.2	11.8	19.1	27.6	20.0
Other costs	18.2	29.4	19.3	6.5	8.5	10.8	15.8
User Fee	111.0	70.5	86.0	51.3	61.4	57.5	71.9
Total	250.2	230.5	289.2	295.7	241.5	304.8	267.9
Tot.Area(ha)	135.87	232.88	303	126.02	295.09	243.35	1336.2
Yield (kg/ha)	6927	6519	3649	5017	3852	4967	4896.3
Gross Revenue	494.8	465.7	260.6	358.4	275.1	354.8	349.7
Net Revenue	244.6	235.2	-28.5	62.6	33.7	50.0	81.8

Table A.1.4. Farm Budgets for Rice: Dry Season 88
Economic Prices

	Karg	Nmrd	Kout	Karm	Daib	Toul	Average
	(000 FCFA/ha)						
Family Labor	39.8	54.8	108.0	169.5	97.5	133.5	99.9
Hired Labor	78.6	46.9	56.7	56.6	55.0	75.4	60.2
Fertilizer	2.7	28.9	19.2	11.8	19.1	27.6	20.0
Other costs	18.2	29.4	19.3	6.5	8.5	10.8	15.8
User Fee	106.7	65.6	79.5	51.3	61.4	57.5	69.6
Total	245.9	225.6	282.7	295.7	241.5	304.8	265.6
Tot.Area(ha)	135.87	232.88	303	126.02	295.09	243.35	1336.2
Yield (kg/ha)	6927	6519	3649	5017	3852	4967	4896.3
Gross Revenue	242.4	228.2	127.7	175.6	134.8	173.8	171.4
Net Revenue	-3.5	2.6	-155.0	-120.1	-106.7	-130.9	-94.3

Table A.1.5. Farm Budget for Rice : Aver. Dry and Rainy Seasons.
Financial Prices.

	Karg	Nmrd	Kout	Karm	Daib	Toul	Average.
	(000 FCFA/ha)						
Family Labor	47.6	65.7	97.2	87.5	86.7	141.3	91.4
Hired Labor	68.2	52.7	49.7	46.4	51.7	89.1	59.4
Fertilizer	3.8	24.0	19.9	16.1	19.3	30.5	20.4
Other costs	16.0	32.5	11.7	6.9	11.0	9.7	14.8
User Fee	111.0	70.5	86.0	51.3	61.3	48.5	70.3
Total	246.5	245.4	264.4	208.2	229.9	319.1	256.3
Tot.Area(ha)	135.87	232.88	303	126.02	295.04	243.27	1336.1
Yield (kg/ha)	5353.5	5370.5	3589.5	4361	4151	4417	4426.7
Gross Revenue	382.4	383.6	256.4	311.5	296.5	315.5	316.2
Net Revenue	135.9	138.2	-8.0	103.3	66.8	-3.6	59.9

Table A.1.6. Farm Budgets for Rice : Average Dry and Rainy Sea Economic Prices

	Karg	Nmrd	Kout	Karm	Daib	Toul	Average
	(000 FCFA/ha)						
Family Labor	47.6	65.7	97.2	87.5	86.7	141.3	91.4
Hired Labor	68.2	52.7	49.7	46.4	51.7	89.1	59.4
Fertilizer	3.8	24.0	19.9	16.1	19.3	30.5	20.4
Other costs	16.0	32.5	11.7	6.9	11.0	9.7	14.8
User Fee	107.2	66.0	80.5	51.3	61.3	48.5	68.3
Total	242.8	240.8	258.9	208.2	229.9	319.1	254.3
Tot.Area(ha)	135.87	232.88	303	126.02	295.04	243.27	1336.1
Yield (kg/ha)	5353.5	5370.5	3589.5	4361	4151	4417	4426.7
Gross Revenue	187.4	188.0	125.6	152.6	145.3	154.6	154.9
Net Revenue	-55.5	-52.9	-133.3	-55.6	-84.6	-164.5	-99.4

ANNEX 2. Cost of Production Data for Cotton in Financial and Economic Prices, by Region.

Data in Tables A.2.1-A.2.4 are from Casey, 1988 and Casey, 1989. Those in Table A.2.5 were provided by ONAHA.

Seed, insecticides and sprayer use are provided to farmers at no cost (see Section 5.2.2. of the main report). Full market costs were used in calculating economic prices.

Economic price of output is derived in Annex 4.

Table A.2.1. Farm Budget for Rainfed Cotton in Financial and Economic Prices. Gaya 1986-1987.

	1986		1987	
	Financial	Economic	Financial	Economic
	(cfa/ha)			
Labor	66,750	66,750	66,750	66,750
Seeds	0	750	0	750
Insecticides	0	45,840	0	45,840
Fertilizer	15,250	15,250	15,250	15,250
Batteries	1,065	1,065	1,065	1,065
Sacks	1,988	1,988	1,988	1,988
Animal Power	3,500	3,500	3,500	3,500
Sprayer	0	900	0	700
Transport	2,381	2,381	2,381	2,381
Yield (kg/ha)	1,190	1,190	1,190	1,190
Pr. Price (cfa/kg)	127	65	100	97
Gross revenue	151,130	77,350	119,000	115,430
Net Revenue	60,196	(61,074)	28,066	(22,794)

Table A.2.2. Farm Budget for Rainfed Cotton in Financial and Economic Prices. Tahoua 1986-1987.

	1986		1987	
	Financial	Economic	Financial	Economic
	(cfa/ha)			
Labor	54,750	54,750	54,750	54,750
Seeds	0	750	0	750
Insecticides	0	22,920	0	22,920
Fertilizer	0	0	0	0
Batteries	1,065	1,065	1,065	1,065
Sacks	1,169	1,169	1,169	1,169
Animal Power	3,500	3,500	3,500	3,500
Sprayer	0	900	0	900
Transport	1,400	1,400	1,400	1,400
Yield (kg/ha)	700	700	700	700
Pr. Price (cfa/kg)	127	65	100	97
Gross revenue	88,900	45,500	70,000	67,900
Net Revenue	27,016	(40,954)	8,116	(18,554)

Table A.2.3. Farm Budget for Recessional Cotton in Financial and Economic Prices. Tahoua 1986-1987.

	1986		1987	
	Financial	Economic	Financial	Economic
	(cfa/ha)			
Labor	27,000	27,000	27,000	27,000
Seeds	0	750	0	750
Insecticides	0	0	0	0
Fertilizer	0	0	0	0
Batteries	0	0	0	0
Sacks	418	418	418	418
Animal Power	0	0	0	0
Sprayer	0	0	0	0
Transport	500	500	500	500
Yield (kg/ha)	250	250	250	250
Pr. Price (cfa/kg)	127	65	100	97
Gross revenue	31,750	16,250	25,000	24,250
Net Revenue	3,832	(12,418)	(2,918)	(4,418)

Table A.2.4. Farm Budget for Irrigated Cotton in Financial and Economic Prices. Tahoua 1986-1987.

	1986		1987	
	Financial	Economic	Financial	Economic
	(cfa/ha)			
Labor	91,000	91,000	130,000	130,000
Seeds	0	750	0	750
Fertilizer	16,224	16,224	16,224	16,224
Insecticides	0	36,026	0	33,500
Batteries	1,065	1,065	1,065	1,065
Sprayers	0	900	0	900
Sacks	3,869	3,869	4,300	4,300
Irrigation	4,000	4,000	4,000	4,000
Ploughing	6,000	6,000	6,000	6,000
Ridging	2,000	2,000	2,000	2,000
De-stumping	2,000	2,000	2,000	2,000
Transport	4,500	4,500	5,150	5,150
User Fee	59,490	59,490	53,000	53,000
Yield (kg/ha)	2,318	2,318	2,580	2,580
Pr. Price (cfa/kg)	127	65	100	97
Gross revenue	294,386	150,670	258,000	250,260
Net Revenue	104,238	(77,154)	34,261	(8,629)

Table A.2.5. Farm Budget for Irrigated Cotton in Financial and Economic Prices. Konni 1988.

	1988	
	Financial	Economic
	(cfa/ha)	
Labor	100,200	100,200
Seeds	0	600
Fertilizer	4,000	4,000
Insecticides	0	26,082
Batteries	1,500	1,500
Sprayers	0	900
Sacks	3,900	3,900
Irrigation	4,000	4,000
Ploughing	6,000	6,000
Ridging	2,000	2,000
De-stumping	2,000	2,000
Transport	4,500	4,500
User Fee	30,000	30,000
Yield (kg/ha)	1,800	1,800
Pr. Price (cfa/ha)	92	54
Gross revenue	165,600	97,200
Net Revenue	7,500	(88,482)

ANNEX 3. User-Fee Data for Rice in Economic Prices, by Perimeter and Cropping Season.

For definition of the user fee, see Section 2.2 of the main report.

Economic prices are identical to financial prices, except for energy costs. A ration of 0.81 was used to derive the economic price of this input, reflecting a 19 percent import tariff (see Section 5.2.2).

All averages are weighted (by production).

Sources: same as Annex 1.

Acronyms: same as Annex 1.

Table A.3.1. User Fee in Rice Perimeters: Rainy Season, 1988. Financial Prices

	Karg	Nmrd	Kout	Karm	Daib	Toul	Average
				(000 cfa/ha)			
Fertilizer	27.4	0.3	0.7	0.5	0.6	1.3	3.4
Energy & lubr.	16.6	21.9	23.0	12.9	17.6	8.4	17.4
Depreciation	22.2	16.6	14.8	13.8	15.7	7.5	14.7
Other costs	44.7	31.7	47.4	24.2	27.2	22.4	33.2
Total	111.0	70.5	86.0	51.3	61.1	39.5	68.6

Table A.3.2. User Fee in Rice Perimeters: Rainy Season, 1988. Economic Prices

	Karg	Nmrd	Kout	Karm	Daib	Toul	Average
				(000 cfa/ha)			
Fertilizer	27.4	0.3	0.7	0.5	0.6	1.3	3.4
Energy & lubr.	13.5	17.8	18.6	12.9	17.6	8.4	15.7
Depreciation	22.2	16.6	14.8	13.8	15.7	7.5	14.7
Other costs	44.7	31.7	47.4	24.2	27.2	22.4	33.2
Total	107.8	66.4	81.6	51.3	61.1	39.5	67.0

Table A.3.3. User Fee in Rice Perimeters: Dry Season, 1988. Financial Prices.

	Karg	Nmrd	Kout	Karm	Daib	Toul	Average
			(000 cfa/ha)				
Fertilizer	31.6	1.2	1.2	1.1	0.9	1.4	4.2
Energy & lubr.	22.6	26.0	34.3	11.3	20.0	21.4	24.0
Depreciation	22.2	12.3	19.2	13.8	15.8	6.6	14.8
Other costs	34.6	31.1	31.2	25.2	24.6	28.1	28.9
Total	111.0	70.5	86.0	51.3	61.4	57.5	71.9

Table A.3.4. User Fee in Rice Perimeters: Dry Season, 1988. Economic Prices.

	Karg	Nmrd	Kout	Karm	Daib	Toul	Average
			(000 cfa/ha)				
Fertilizer	31.6	1.2	1.2	1.1	0.9	1.4	4.2
Energy & lubr.	18.3	21.1	27.8	11.3	20.0	21.4	21.7
Depreciation	22.2	12.3	19.2	13.8	15.8	6.6	14.8
Other costs	34.6	31.1	31.2	25.2	24.6	28.1	28.9
Total	106.7	65.6	79.5	51.3	61.4	57.5	69.6

Table A.3.5. User Fee in Rice Perimeters: Dry & Rainy Seasons, 1988. Financial Prices.

	Karg	Nmrd	Kout	Karm	Daib	Toul	Weight. Average
			('000 cfa/ha)				
Fertilizer	29.5	0.7	1.0	0.8	0.7	1.3	3.8
Energy & lubr.	19.6	24.0	28.7	12.1	18.8	14.9	20.7
Depreciation	22.2	14.4	17.0	13.8	15.8	7.1	14.7
Other costs	39.7	31.4	39.3	24.7	25.9	25.2	31.1
Total	111.0	70.5	86.0	51.3	61.3	48.5	70.3

Table A.3.6. User Fee in Rice Perimeters: Dry & Rainy Seasons, 1988. Economic Prices

	Karg	Nmrd	Kout	Karm	Daib	Toul	W. Avr.
			(000 cfa/ha)				
Fertilizer	29.5	0.7	1.0	0.8	0.7	1.3	3.8
Energy & lubr.	15.9	19.4	23.2	12.1	18.8	14.9	18.7
Depreciation	22.2	14.4	17.0	13.8	15.8	7.1	14.7
Other costs	39.7	31.4	39.3	24.7	25.9	25.2	31.1
Total	107.2	66.0	80.5	51.3	61.3	48.5	68.3

ANNEX 4. Border Prices: Data Sources and Calculation Procedures

This annex estimates an international price equivalent for rice and cotton in Niger. Due to data limitations, rice prices are calculated only for 1987-1989 for rice, and 1986-1989 for cotton. Basic data used for estimation were obtained from ONAHA and RINI for rice and CFDT, CSPPN and SONITEXTIL for cotton.

The following schedule was used to derive border prices:

Rice

1. By-products and processing ratio

	1987	1988	1989
	Percent		
By-products	6.91	6.85	5.00
Milling ratio	64.41	65.87	65.87

2. Customs duties and taxes

1987	1988	1989
Percent of c.i.f. Niger		
10.21	14.33	22.57

3. Milling costs include RINI marketing margin. Variations in milling costs are due to volumes processed and, therefore, capacity utilization.

4. Cooperatives' marketing margin is cfa 3/kg.

Cotton

1. Items used for 1986-1987 are different from those used in 1988-1989, reflecting the new marketing arrangement between CFDT and the Government of Niger in 1988.

2. By-products and processing ratio

	1986	1987	1988	1989
	Percent			
By-products	51.19	53.66	58.19	56.77
Milling ratio	39.49	38.65	38.89	40.79

3. A coefficient of 90 percent was used to correct for quality differential.

4. CSPPN margin in export market is 10 percent of f.o.b. Cotonu. CSPPN margin in domestic market is 10 percent of world price at factory.

5. CFDT export commission is 0.5 percent of f.o.b. Cotonu corrected for quality differential.

Detailed results are presented in the three tables below. The following symbols are used to explain calculation procedures:

- \- Subtract
- \+ Add
- * Multiply

Table A.4.1. Calculation of a Border Price Equivalent for Rice, 1987-1989

	Calcul. Proced.	cfa/mt		
		1987	1988	1989
1. c.i.f Niamey		99,106	116,096	133,000
2. "Fonds de Garantie" Tax	-	248	290	333
3. Customs Duties				
Rice	-	10,119	16,637	30,018
Sacks	-	397	397	397
4. Parity Tax	-	10,100	10,100	10,100
5. Transit Tax	-	2,500	2,500	2,500
6. Value-Added Tax on Transit	-	425	425	425
7. Transhipment Charges	+	657	657	657
8. World Price (at mill)-Niamey	Sum(1-7)	75,974	86,404	89,884
9. Milling Cost	-	26,000	24,800	21,000
10. Value of By-Product	+	907	899	657
11. Milling Ratio	*			
12. World Price of Paddy at Mill	Sum(8-10) *(11)	32,773	38,238	42,874
13. Transport from Cooperative to Mill	-	2,933	2,933	2,933
14. World Price of Paddy at Cooperative	Sum(12-13	29,840	38,238	42,874
15. World Price of Paddy at Cooperative/kg		30	38	43
16. World Price of Paddy at Farmgate/kg		27	35	40

Table A.4.2. Calculation of a Border Price Equivalent for Cotton: 1986-1987

	Calcul. Proced.	cfa/mt 1986	cfa/mt 1987
1. FOB Cotonu		343,792	442,908
2. Correction for Quality Diff.	*	309,413	398,618
3. Costs Factory to FOB	-	21,800	21,800
4. Sales Commission	-	2,600	2,500
5. Processing Cost	-	36,500	36,500
6. Value of By-Prod. (cfa 15/kg) for a Ratio of	+	8,429	8,049
7. Processing Ratio	*	101,466	133,677
8. Transport from Coop. to Factory	-	7,600	7,600
9. Interest on Credit	-	8,600	8,700
10. Other Costs	-	20,000	20,000
World Price at Cooperative/mt		65,266	97,377
World Price at Cooperative/kg		65	97

Table A.4.3. Calculation of a Border Price Equivalent for Cotton: 1988-1989

	Calcul. Proced.	cfa/mt 1988	cfa/mt 1989
1. FOB Cotonu		363,833	387,000
2. Correction for Quality Diff.	*	327,450	348,300
3. Port Charges-Cotonu	-	18,000	18,283
4. Transit Benin	-	28,152	22,495
5. Transit Niger	-	12,354	17,777
6. Transport Paraku-Cotonu	-	7,500	7,500
7. Transport Madaoua-Paraku	-	21,794	21,794
8. CFDT Commission	-	1,637	1,742
9. CSPPN Margin in Export Market	-	32,745	34,830
10. Processing Cost	-	30,500	30,500
11. Packaging Cost	-	5,000	5,000
12. Value of By-Prod. (cfa 15/kg)	+	8,729	8,516
13. Processing Ratio	*		
14. World Price at Factory		69,417	80,314
15. Transport from Coop. to Factory	-	8,949	10,912
16. CSPPN Margin in Domestic Market	-	6,942	8,031
World Price at Cooperative/mt		53,526	61,371
World Price at Cooperative/kg		54	61

ANNEX 5. Effective Protection Coefficients for Rice, by Perimeter and Cropping Season.

For definitions of effective protection coefficients, tradable inputs and value-added, refer to Section 6.2.1.

For definition of gross revenue, see Annex 1.

Economic prices are identical to financial prices, except for output and energy and lubricants. Economic price of output is derived in Annex 4; for coefficient used to derive the economic cost of energy and lubricants, see Annex 3.

Sources: same as Annex 1.
Acronyms: same as Annex 1.

Table A.5.1. Effective Protection Coefficients for Rice: Rainy Season, 1988

	Karg	Nmrd	Kout	Karm	Daib	Toul	Average
			('000 FCFA/ha)				
			A. Domestic Prices				
1. Gross Revenue	270.0	301.6	252.1	264.6	317.9	276.2	282.7
2. Fertilizer	32.2	19.3	21.2	20.9	20.0	34.7	24.2
3. Energy & lubr.	16.6	21.9	23.0	12.9	17.6	8.4	17.4
4. Tradable Inputs (2)+(3)	48.9	41.3	44.2	33.8	37.5	43.1	41.5
5. Value Added (1)-(4)	221.1	260.3	207.9	230.9	280.2	233.2	241.1
			B. Border Prices				
1'.Gross Revenue	132.3	147.8	123.6	129.7	155.8	135.3	138.5
2'.Fertilizer	32.2	19.3	21.2	20.9	20.0	34.7	24.2
3'.Energy & lubr	13.5	17.8	18.6	12.9	17.6	8.4	15.7
4'.Tradable Inputs (2')+(3')	45.7	37.1	39.9	33.8	37.6	43.1	39.9
5'.Value Added (1')-(4')	86.6	110.7	83.7	95.9	118.1	92.3	98.6
EPC (5)/(5')	2.55	2.35	2.48	2.41	2.37	2.53	2.44

Table A.5.2. Effective Protection for Rice: Dry Season, 1988

	Karg	Nmrd	Kout	Karm	Daib	Toul	Average
			('000 FCFA/ha)				
A. Domestic Prices							
1. Gross Revenue	494.8	465.7	260.6	358.4	275.1	354.8	349.7
2. Fertilizer	34.3	30.1	20.4	12.9	20.0	29.0	24.3
3. Energy & lubr.	22.6	26.0	34.3	11.3	20.0	21.4	24.0
4. Tradable Inputs (2)+(3)	56.9	56.1	54.7	24.1	40.0	50.4	48.3
5. Value Added (1)-(4)	437.9	409.6	205.9	334.3	235.1	304.4	301.5
B. Border Prices							
1'.Gross Revenue	242.4	228.2	127.7	175.6	134.8	173.8	171.4
2'.Fertilizer	34.3	30.1	20.4	12.9	20.0	29.0	24.3
3'.Energy & lubr	18.3	21.1	27.8	11.3	20.0	21.4	21.7
4'.Tradable Inputs (2')+(3')	52.6	51.1	48.2	24.1	40.0	50.4	46.0
5'.Value Added (1')-(4')	189.9	177.0	79.5	151.5	94.8	123.5	125.4
EPC (5)/(5')	2.31	2.31	2.59	2.21	2.48	2.47	2.40

Table A.5.3. Effective Protection for Rice : W. Avr. Dry/Rainy

	Karg	Nmrd	Kout	Karm	Daib	Toul	Weight Average
			('000 FCFA/ha)				
			A. Domestic Prices				
1. Gross Revenue	382.4	383.6	256.4	311.5	296.5	315.5	316.2
2. Fertilizer	33.3	24.7	20.8	16.9	20.0	31.8	24.2
3. Energy & lubr.	19.6	24.0	28.7	12.1	18.8	14.9	20.7
4. Tradable Inputs (2)+(3)	52.9	48.7	49.5	29.0	38.8	46.7	44.9
5. Value Added (1)-(4)	329.5	334.9	206.9	282.6	257.7	268.8	271.3
			B. Border Prices				
1'.Gross Revenue	187.4	188.0	125.6	152.6	145.3	154.6	154.9
2'.Fertilizer	33.3	24.7	20.8	16.9	20.0	31.8	24.2
3'.Energy & lubr.	15.9	19.4	23.2	12.1	18.8	14.9	18.7
4'.Tradable Inputs (2')+(3')	49.1	44.1	44.0	29.0	38.8	46.7	42.9
5'.Value Added (1')-(4')	138.2	143.9	81.6	123.7	106.5	107.9	112.0
EPC (5)/(5')	2.38	2.33	2.54	2.28	2.42	2.49	2.42

ANNEX 6. Effective Protection Coefficients for Cotton, by Region.

For definitions, refer to Section 6.2.1 of the main report.

Economic prices: same as Annex 2.

Sources: Annex 2.

Table A.6.1. Effective Protection Coefficients for Rainfed Cotton, Gaya 1986-1987

	1986		1987	
	Domestic	Border	Domestic	Border
	(cfa/ha)		(cfa/ha)	
1. Output	151,130	77,350	119,000	115,430
2. Seeds	0	750	0	750
3. Insecticides	0	45,840	0	45,840
4. Fertilizer	15,250	15,250	15,250	15,250
5. Batteries	1,065	1,065	1,065	1,065
6. Sacks	1,988	1,988	1,988	1,988
7. Sprayer	0	900	0	700
8. Tradable Inputs Sum(2..7)	18,303	65,793	18,303	65,593
9.Value Added (1)-(8)	132,827	11,557	100,697	49,837
EPC (VA^d/VA^b)	11.49		2.02	

Table A.6.2. Effective Protection Coefficients for Rainfed Cotton, Tahoua 1986-1987

	1986		1987	
	Domestic	Border	Domestic	Border
	(cfa/ha)		(cfa/ha)	
1. Output	88,900	45,500	70,000	67,900
2. Seeds	0	750	0	750
3. Insecticides	0	22,920	0	22,920
4. Fertilizer	0	0	0	0
5. Batteries	1,065	1,065	1,065	1,065
6. Sacks	1,169	1,169	1,169	1,169
7. Sprayer	0	900	0	900
8. Tradable Inputs Sum(2..7)	2,234	26,804	2,234	26,804
9.Value Added (1)-(8)	86,666	18,696	67,766	41,096
EPC (VA^d/VA^b)	4.64		1.65	

Table A.6.3. Effective Protection Coefficients for Flood Recession Cotton, Tahoua 1986-1987

	1986		1987	
	Domestic	Border	Domestic	Border
	(cfa/ha)		(cfa/ha)	
1.Output	31,750	16,250	25,000	24,250
2.Seeds	0	750	0	750
3.Insecticides	0	0	0	0
4.Fertilizer	0	0	0	0
5.Batteries	0	0	0	0
6.Sacks	418	418	418	418
7.Sprayer	0	0	0	0
8.Tradable Inputs Sum(2..7)	418	1,168	418	1,168
9.Value Added (1)-(8)	31,332	15,082	24,582	23,082
EPC (VA^d/VA^b)	2.08		1.06	

Table A.6.4. Effective Protection Coefficients for Irrigated Cotton, Tahoua 1986-1987

	1986		1987	
	Domestic	Border	Domestic	Border
	(cfa/ha)		(cfa/ha)	
1. Output	294,386	150,670	258,000	250,260
2. Seeds	0	750	0	750
3. Fertilizers	16,224	16,224	16,224	16,224
4. Insecticides	0	36,026	0	33,500
5. Batteries	1,065	1,065	1,065	1,065
6. Sprayers	0	900	0	900
7. Sacks	3,869	3,869	4,300	4,300
8. Tradable Inputs Sum(2..7)	21,158	58,835	21,589	56,739
9.Value Added (1)-(8)	273,228	91,835	236,411	193,521
EPC (VA^d/VA^b)	2.98		1.22	

Table A 6.5. Effective Protection Coefficients for Irrigated Cotton, Konni 1988

	1988 Domestic (cfa/ha)	1988 Border (cfa/ha)
1. Output	165,600	97,200
2. Seeds	0	600
3. Fertilizer	4,000	4,000
4. Insecticides	0	26,082
5. Batteries	1,500	1,500
6. Sprayers	0	900
7. Sacks	3,900	3,900
8. Tradable Inputs Sum(2..7)	9,400	36,982
9.Value Added (1)-(8)	156,200	60,218

EPC (VA^d/VA^b) 2.59

ANNEX 7. Analysis of the Impact of Pricing Policies in the Rice and Cotton Sectors on the Welfare of Producers, Consumers, Government Revenue and the National Economy.

A.7.1. The Rice Sector

As explained in Section 5.2.1.1 and Annex 4, due to the import tariff and other import taxes, prices paid to rice farmers in Niger are higher than import parity. A graphical illustration of the economic and welfare implications of the support policy are presented in Figure A.7.1. Before imposition of the tariff, the domestic price P is equal to the international price. Total demand at this price is Qc, of which Qp is local production and (Qc-Qp) is food aid and commercial imports. The import taxes raise the domestic price to P'. The higher price causes domestic supply to increase from Qp to Qp', total demand to decline from Qc to Qc' and imports to drop from (Qc-Qp) to (Qc'-Qp').

Thus, the support price promotes local production, narrows the import gap and generates government revenue. These gains are, however, outweighed by the losses incurred by consumers. As a result of the price intervention, consumers lose area a+b+c+d, of which area a is transferred to rice producers and area c (equal to the quantity imported [Qc'-Qp'] times the per-unit tax [P'-P]) to the government budget, for a net loss of area b+d. The deadweight or efficiency loss is due to the fact that domestic resources are now being utilized to produce rice at a price higher than the opportunity cost of importing this or other substitute commodities.

The effects of current government policies as illustrated in Figure A.7.1 are summarized below:

Welfare Analysis
Rice Policies in Niger

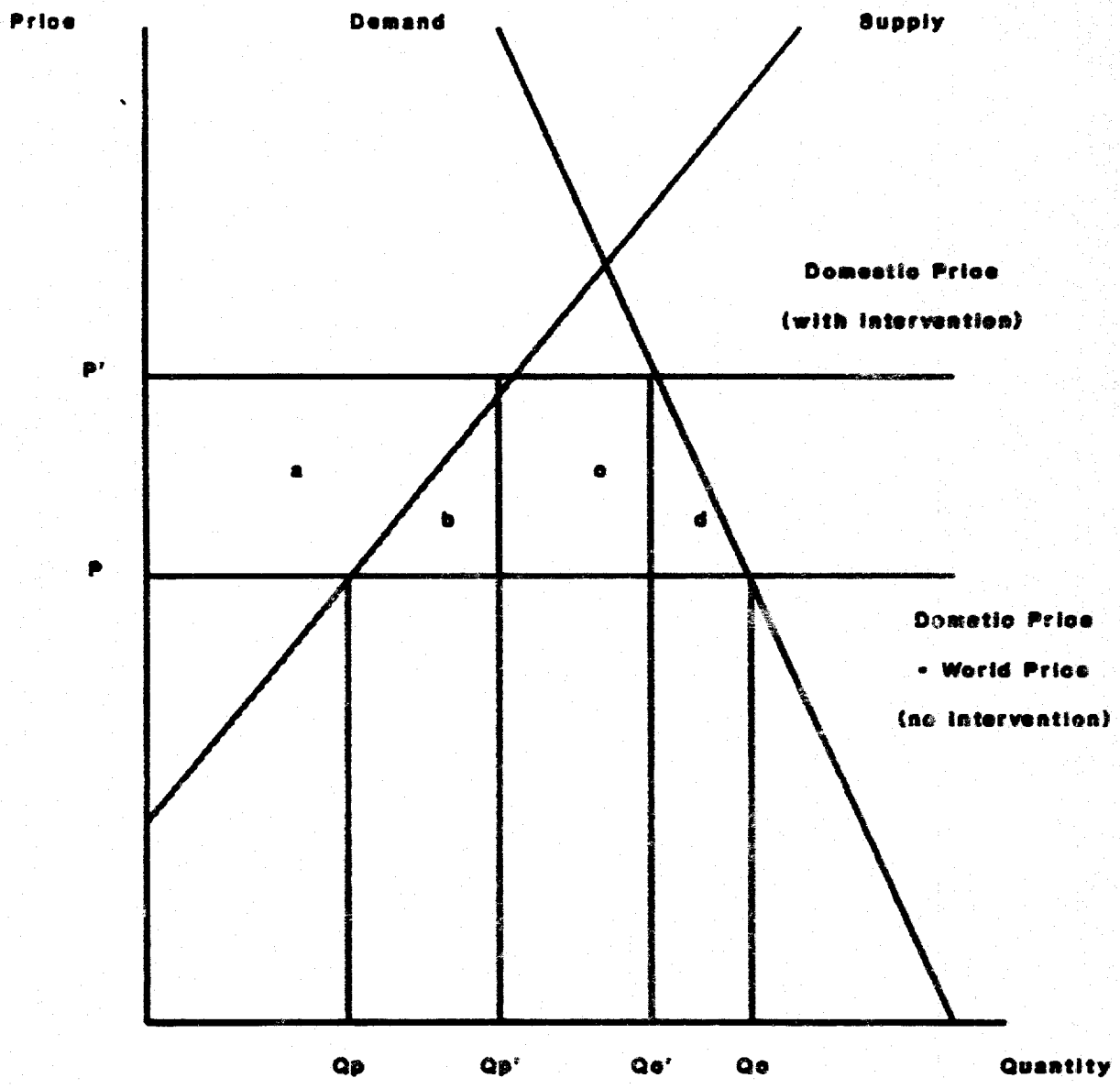

Figure A.7.1

Gain to producers	Area a
Loss to consumers	Area a+b+c+d
Gain to government	Area c
Net social cost	Area b+d
Increase in production	Qp'-Qp
Decrease in imports	(Qc-Qc')+(Qp'-Qp)

These effects are estimated in Tables A.7.1-A.7.9. Main assumptions underlying the calculations are:

1. In the absence of elasticity estimates for rice in Niger, results for a range of demand and supply parameters are reported. Such estimates may be viewed as a sensitivity analysis showing results for alternative elasticity assumptions. Results could not be further refined, due to the absence of elasticity estimates for West-African countries and the wide variations (between approximately zero to more than unity) characterizing such estimates in other developing countries.

2. Results are not from a general equilibrium model. In addition, the partial equilibrium analysis does not include cross elasticities of supply and demand.

3. Welfare effects are calculated from linear approximations of the curvilinear supply and demand curves.

4. Even though subsistence production may be influenced by trade policies, on-farm consumption is, for convenience and data availability, omitted from the welfare analysis.

5. Prices and quantities are for 1988, the most recent year for which a complete set of data exist.

Symbols used in Tables A.7.1-A.7.9 are as follows:

^ = exponential
* = multiplication
/ = division
! = change in

Numbers in parentheses in column 3 refer to item numbers in column 1.

Table A.7.1. Es=.1; Ed=-.1

Item	Unit	Symbol	Estimate
Parameters			
1. Domestic Production	mt 000	o	43
2. Proportion Marketed	%	m	70%
3. Domest. Markt. Prod.	mt 000	Q=(o*m)	30
4. Imports (paddy equiv.)	mt 000	M	108
5. Total Markt. Cons.	mt 000	C	138
6. Support Price	cfa 000/mt	p	71
7. Border Price	cfa 000/mt	pb	35
8. Elasticity of Supply		Es	0.1
9. Elasticity of Demand		Ed	-0.1
Estimates			
10. Supply Intercept		a=Q/p^Es	20
11. Demand Intercept		b=(c)/p^Ed	211
12. Production at Border Price	mt 000	Qp=a*(pb)^Es	28
13. Consumption @ Border Price	mt 000	Qc=(b*(pb)^Ed)	148
14. Imp. @ Border P. (paddy)	mt 000	Qc-Qp	120
15. Decrease in Dom. Markt. Prod.	mt 000	!Qp=Q-Qp	2
16. Increase in Tot. Markt. Cons.	mt 000	!Qc=Qc-(c)	10
17. Increase in Imports	mt 000	(14)-(4)	12
18. Change in Price	cfa 000/mt	!p=p-pb	36
19. Net Social Gain from Prod.	cfa (million)	Psc=(.5*!Qp*!p)/1000	38
20. Net Social Gain from Cons.	cfa (million)	Csc=(.5*!Qc*!p)/1000	185
21. Total Net Soc. Gain	cfa (million)	(19)+(20)	223
22. Loss to Government	cfa (million)	!p* M	3,923
23. Loss to Producers	cfa (million)	(24)-(21)-(22)	1,056
24. Gain to Consumers	cfa (million)	(8)*(17)+(17)*(12)+(20)	5,202
25. Social Costs/Transfer to Prod.	cfa	(21)/(23)	0.21

Table A.7.2. Es=.1; Ed=-.5

Item	Unit	Symbol	Estimate
Parameters			
1. Domestic Production	mt 000	o	43
2. Proportion Marketed	%	m	70%
3. Domest. Markt. Prod.	mt 000	Q=(o*m)	30
4. Imports (paddy equiv.)	mt 000	M	108
5. Total Markt. Cons.	mt 000	C	138
6. Support Price	cfa 000/mt	p	71
7. Border Price	cfa 000/mt	pb	35
8. Elasticity of Supply		Es	0.1
9. Elasticity of Demand		Ed	-0.5
Estimates			
10. Supply Intercept		a=Q/p^Es	20
11. Demand Intercept		b=(c)/p^Ed	1,164
12. Production at Border Price	mt 000	Qp=a*(pb)^Es	28
13. Consumption @ Border Price	mt 000	Qc=(b*(pb)^Ed)	197
14. Imp. @ Border P. (paddy)	mt 000	Qc-Qp	169
15. Decrease in Dom. Markt. Prod.	mt 000	!Qp=Q-Qp	2
16. Increase in Tot. Markt. Cons.	mt 000	!Qc=Qc-(c)	59
17. Increase in Imports	mt 000	(14)-(4)	61
18. Change in Price	cfa 000/mt	!p=p-pb	36
19. Net Social Gain from Prod.	cfa (million)	Psc=(.5*!Qp*!p)/1000	38
20. Net Social Gain from Cons.	cfa (million)	Csc=(.5*!Qc*!p)/1000	1,075
21. Total Net Soc. Gain	cfa (million)	(19)+(20)	1,113
22. Loss to Government	cfa (million)	!p* M	3,923
23. Loss to Producers	cfa (million)	(24)-(21)-(22)	1,056
24. Gain to Consumers	cfa (million)	(8)*(17)+(17)*(12)+(20)	6,092
25. Social Costs/Transfer to Prod.	cfa	(21)/(23)	1.05

Table A.7.3. Es=.1; Ed=-.9

Item	Unit	Symbol	Estimate
Parameters			
1. Domestic Production	mt 000	o	43
2. Proportion Marketed	%	m	70%
3. Domest. Markt. Prod.	mt 000	Q=(o*m)	30
4. Imports (paddy equiv.)	mt 000	M	108
5. Total Markt. Cons.	mt 000	C	138
6. Support Price	cfa 000/mt	p	71
7. Border Price	cfa 000/mt	pb	35
8. Elasticity of Supply		Es	0.1
9. Elasticity of Demand		Ed	-0.9
Estimates			
10. Supply Intercept		a=Q/p^Es	20
11. Demand Intercept		b=(c)/p^Ed	6,419
12. Production at Border Price	mt 000	Qp=a*(pb)^Es	28
13. Consumption @ Border Price	mt 000	Qc=(b*(pb)^Ed)	262
14. Imp. @ Border P. (paddy)	mt 000	Qc-Qp	234
15. Decrease in Dom. Markt. Prod.	mt 000	!Qp=Q-Qp	2
16. Increase in Tot. Markt. Cons.	mt 000	!Qc=Qc-(c)	124
17. Increase in Imports	mt 000	(14)-(4)	126
18. Change in Price	cfa 000/mt	!p=p-pb	36
19. Net Social Gain from Prod.	cfa (million)	Psc=(.5*!Qp*!p)/1000	38
20. Net Social Gain from Cons.	cfa (million)	Csc=(.5*!Qc*!p)/1000	2,258
21. Total Net Soc. Gain	cfa (million)	(19)+(20)	2,296
22. Loss to Government	cfa (million)	!p* M	3,923
23. Loss to Producers	cfa (million)	(24)-(21)-(22)	1,056
24. Gain to Consumers	cfa (million)	(8)*(17)+(17)*(12)+(20)	7,275
25. Social Costs/Transfer to Prod.	cfa	(21)/(23)	2.17

Table A.7.4. Es=.5; Ed=-.1

Item	Unit	Symbol	Estimate
Parameters			
1. Domestic Production	mt 000	o	43
2. Proportion Marketed	%	m	70%
3. Domest. Markt. Prod.	mt 000	Q=(o*m)	30
4. Imports (paddy equiv.)	mt 000	M	108
5. Total Markt. Cons.	mt 000	C	138
6. Support Price	cfa 000/mt	p	71
7. Border Price	cfa 000/mt	pb	35
8. Elasticity of Supply		Es	0.5
9. Elasticity of Demand		Ed	-0.1

Estimates			
10. Supply Intercept		a=Q/p^Es	4
11. Demand Intercept		b=(c)/p^Ed	211
12. Production at Border Price	mt 000	Qp=a*(pb)^Es	21
13. Consumption @ Border Price	mt 000	Qc=(b*(pb)^Ed)	148
14. Imp. @ Border P. (paddy)	mt 000	Qc-Qp	127
15. Decrease in Dom. Markt. Prod.	mt 000	!Qp=Q-Qp	9
16. Increase in Tot. Markt. Cons.	mt 000	!Qc=Qc-(c)	10
17. Increase in Imports	mt 000	(14)-(4)	19
18. Change in Price	cfa 000/mt	!p=p-pb	36
19. Net Social Gain from Prod.	cfa (million)	Psc=(.5*!Qp*!p)/1000	164
20. Net Social Gain from Cons.	cfa (million)	Csc=(.5*!Qc*!p)/1000	185
21. Total Net Soc. Gain	cfa (million)	(19)+(20)	349
22. Loss to Government	cfa (million)	!p* M	3,923
23. Loss to Producers	cfa (million)	(24)-(21)-(22)	929
24. Gain to Consumers	cfa (million)	(8)*(17)+(17)*(12)+(20)	5,202
25. Social Costs/Transfer to Prod.	cfa	(21)/(23)	0.38

Table A.7.5. Es=.5; Ed=-.5

Item	Unit	Symbol	Estimate
Parameters			
1. Domestic Production	mt 000	o	43
2. Proportion Marketed	%	m	70%
3. Domest. Markt. Prod.	mt 000	Q=(o*m)	30
4. Imports (paddy equiv.)	mt 000	M	108
5. Total Markt. Cons.	mt 000	C	138
6. Support Price	cfa 000/mt	p	71
7. Border Price	cfa 000/mt	pb	35
8. Elasticity of Supply		Es	0.5
9. Elasticity of Demand		Ed	-0.5
Estimates			
10. Supply Intercept		a=Q/p^Es	4
11. Demand Intercept		b=(c)/p^Ed	1,164
12. Production at Border Price	mt 000	Qp=a*(pb)^Es	21
13. Consumption @ Border Price	mt 000	Qc=(b*(pb)^Ed)	197
14. Imp. @ Border P. (paddy)	mt 000	Qc-Qp	176
15. Decrease in Dom. Markt. Prod.	mt 000	!Qp=Q-Qp	9
16. Increase in Tot. Markt. Cons.	mt 000	!Qc=Qc-(c)	59
17. Increase in Imports	mt 000	(14)-(4)	68
18. Change in Price	cfa 000/mt	!p=p-pb	36
19. Net Social Gain from Prod.	cfa (million)	Psc=(.5*!Qp*!p)/1000	164
20. Net Social Gain from Cons.	cfa (million)	Csc=(.5*!Qc*!p)/1000	1,075
21. Total Net Soc. Gain	cfa (million)	(19)+(20)	1,239
22. Loss to Government	cfa (million)	!p* M	3,923
23. Loss to Producers	cfa (million)	(24)-(21)-(22)	929
24. Gain to Consumers	cfa (million)	(8)*(17)+(17)*(12)+(20)	6,092
25. Social Costs/Transfer to Prod.	cfa	(21)/(23)	1.33

Table A.7.6. Es=.5; Ed=-.9

Item	Unit	Symbol	Estimate
Parameters			
1. Domestic Production	mt 000	o	43
2. Proportion Marketed	%	m	70%
3. Domest. Markt. Prod.	mt 000	Q=(o*m)	30
4. Imports (paddy equiv.)	mt 000	M	108
5. Total Markt. Cons.	mt 000	C	138
6. Support Price	cfa 000/mt	p	71
7. Border Price	cfa 000/mt	pb	35
8. Elasticity of Supply		Es	0.5
9. Elasticity of Demand		Ed	-0.9
Estimates			
10. Supply Intercept		a=Q/p^Es	4
11. Demand Intercept		b=(c)/p^Ed	6,419
12. Production at Border Price	mt 000	Qp=a*(pb)^Es	21
13. Consumption @ Border Price	mt 000	Qc=(b*(pb)^Ed)	262
14. Imp. @ Border P. (paddy)	mt 000	Qc-Qp	241
15. Decrease in Dom. Markt. Prod.	mt 000	!Qp=Q-Qp	9
16. Increase in Tot. Markt. Cons.	mt 000	!Qc=Qc-(c)	124
17. Increase in Imports	mt 000	(14)-(4)	133
18. Change in Price	cfa 000/mt	!p=p-pb	36
19. Net Social Gain from Prod.	cfa (million)	Psc=(.5*!Qp*!p)/1000	164
20. Net Social Gain from Cons.	cfa (million)	Csc=(.5*!Qc*!p)/1000	2,258
21. Total Net Soc. Gain	cfa (million)	(19)+(20)	2,422
22. Loss to Government	cfa (million)	!p* M	3,923
23. Loss to Producers	cfa (million)	(24)-(21)-(22)	929
24. Gain to Consumers	cfa (million)	(8)*(17)+(17)*(12)+(20)	7,275
25. Social Costs/Transfer to Prod.	cfa	(21)/(23)	2.61

Table A.7.7. Es=.9; Ed=-.1

Item	Unit	Symbol	Estimate
Parameters			
1. Domestic Production	mt 000	o	43
2. Proportion Marketed	%	m	70%
3. Domest. Markt. Prod.	mt 000	Q=(o*m)	30
4. Imports (paddy equiv.)	mt 000	M	108
5. Total Markt. Cons.	mt 000	C	138
6. Support Price	cfa 000/mt	p	71
7. Border Price	cfa 000/mt	pb	35
8. Elasticity of Supply		Es	0.9
9. Elasticity of Demand		Ed	-0.1
Estimates			
10. Supply Intercept		a=Q/p^Es	1
11. Demand Intercept		b=(c)/p^Ed	211
12. Production at Border Price	mt 000	Qp=a*(pb)^Es	16
13. Consumption @ Border Price	mt 000	Qc=(b*(pb)^Ed)	148
14. Imp. @ Border P. (paddy)	mt 000	Qc-Qp	132
15. Decrease in Dom. Markt. Prod.	mt 000	!Qp=Q-Qp	14
16. Increase in Tot. Markt. Cons.	mt 000	!Qc=Qc-(c)	10
17. Increase in Imports	mt 000	(14)-(4)	24
18. Change in Price	cfa 000/mt	!p=p-pb	36
19. Net Social Gain from Prod.	cfa (million)	Psc=(.5*!Qp*!p)/1000	259
20. Net Social Gain from Cons.	cfa (million)	Csc=(.5*!Qc*!p)/1000	185
21. Total Net Soc. Gain	cfa (million)	(19)+(20)	445
22. Loss to Government	cfa (million)	!p* M	3,923
23. Loss to Producers	cfa (million)	(24)-(21)-(22)	834
24. Gain to Consumers	cfa (million)	(8)*(17)+(17)*(12)+(20)	5,202
25. Social Costs/Transfer to Prod.	cfa	(21)/(23)	0.53

Table A.7.8. Es=.9; Ed=-.5

Item	Unit	Symbol	Estimate
Parameters			
1. Domestic Production	mt 000	o	43
2. Proportion Marketed	%	m	70%
3. Domest. Markt. Prod.	mt 000	Q=(o*m)	30
4. Imports (paddy equiv.)	mt 000	M	108
5. Total Markt. Cons.	mt 000	C	138
6. Support Price	cfa 000/mt	p	71
7. Border Price	cfa 000/mt	pb	35
8. Elasticity of Supply		Es	0.9
9. Elasticity of Demand		Ed	-0.5

	Estimates			
10.	Supply Intercept		a=Q/p^Es	1
11.	Demand Intercept		b=(c)/p^Ed	1,164
12.	Production at Border Price	mt 000	Qp=a*(pb)^Es	16
13.	Consumption @ Border Price	mt 000	Qc=(b*(pb)^Ed)	197
14.	Imp. @ Border P. (paddy)	mt 000	Qc-Qp	181
15.	Decrease in Dom. Markt. Prod.	mt 000	!Qp=Q-Qp	14
16.	Increase in Tot. Markt. Cons.	mt 000	!Qc=Qc-(c)	59
17.	Increase in Imports	mt 000	(14)-(4)	73
18.	Change in Price	cfa 000/mt	!p=p-pb	36
19.	Net Social Gain from Prod.	cfa (million)	Psc=(.5*!Qp*!p)/1000	259
20.	Net Social Gain from Cons.	cfa (million)	Csc=(.5*!Qc*!p)/1000	1,075
21.	Total Net Soc. Gain	cfa (million)	(19)+(20)	1,334
22.	Loss to Government	cfa (million)	!p* M	3,923
23.	Loss to Producers	cfa (million)	(24)-(21)-(22)	834
24.	Gain to Consumers	cfa (million)	(8)*(17)+(17)*(12)+(20)	6,092
25.	Social Costs/Transfer to Prod.	cfa	(21)/(23)	1.60

Table A.7.9. Es=.9; Ed=-.9

Item	Unit	Symbol	Estimate
Parameters			
1. Domestic Production	mt 000	o	43
2. Proportion Marketed	%	m	70%
3. Domest. Markt. Prod.	mt 000	Q=(o*m)	30
4. Imports (paddy equiv.)	mt 000	M	108
5. Total Markt. Cons.	mt 000	C	138
6. Support Price	cfa 000/mt	p	71
7. Border Price	cfa 000/mt	pb	35
8. Elasticity of Supply		Es	0.9
9. Elasticity of Demand		Ed	-0.9
Estimates			
10. Supply Intercept		a=Q/p^Es	1
11. Demand Intercept		b=(c)/p^Ed	6,419
12. Production at Border Price	mt 000	Qp=a*(pb)^Es	16
13. Consumption @ Border Price	mt 000	Qc=(b*(pb)^Ed)	262
14. Imp. @ Border P. (paddy)	mt 000	Qc-Qp	246
15. Decrease in Dom. Markt. Prod.	mt 000	!Qp=Q-Qp	14
16. Increase in Tot. Markt. Cons.	mt 000	!Qc=Qc-(c)	124
17. Increase in Imports	mt 000	(14)-(4)	138
18. Change in Price	cfa 000/mt	!p=p-pb	36
19. Net Social Gain from Prod.	cfa (million)	Psc=(.5*!Qp*!p)/1000	259
20. Net Social Gain from Cons.	cfa (million)	Csc=(.5*!Qc*!p)/1000	2,258
21. Total Net Soc. Gain	cfa (million)	(19)+(20)	2,517
22. Loss to Government	cfa (million)	!p* M	3,923
23. Loss to Producers	cfa (million)	(24)-(21)-(22)	834
24. Gain to Consumers	cfa (million)	(8)*(17)+(17)*(12)+(20)	7,275
25. Social Costs/Transfer to Prod.	cfa	(21)/(23)	3.02

A.7.2. The Cotton Sector

A graphical illustration of the welfare implications of the support price paid to cotton growers is presented in Figure A.7.2. Export demand facing Niger is assumed to be perfectly elastic at world prices, Pw. In the absence of any intervention, domestic prices are equal to Pw and Qw is exported. The support price policy causes domestic prices and exports to rise to Ps and Qs, respectively. Since no exports are possible at Pd, it is evident that a government agency must pay the difference Pd-Pw to producers. The subsidy is equal to (Ps-Pw)*Qs or area b+c. Gains to producers are equal to the change in producer surplus or area b. Since all cotton is exported, consumers are not affected by the policy. Thus, net social loss is equal to government subsidy minus gains to producers or area (b+c)-b=c.

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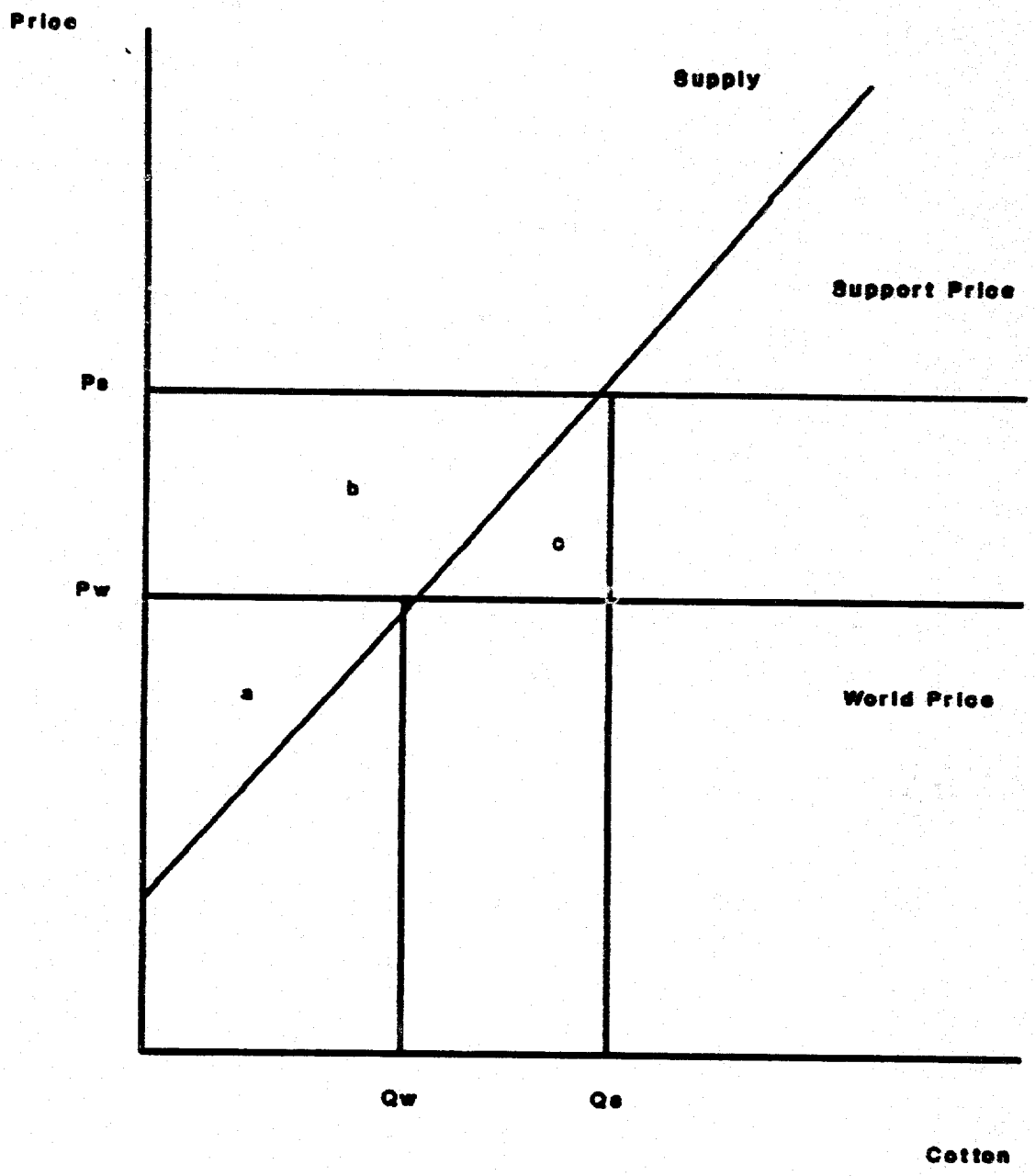

Figure A.7.2

Loss to government, gain to producers and efficiency loss are estimated in Tables A.7.10-A.7.12. Assumptions 1-3 and 5 listed in Section A.7.1. are used. Symbols in the tables are the same as in Tables A.7.1-A.7.9.

Table A.7.10. Es=.1

Item	Unit	Symbol	Estimate
Parameter			
1. Production	mt 000		6
2. Domestic Price	cfa/mt 000		100
3. Border Price	cfa/mt 000		61
4. Elasticity of Supply			0.1
Estimate			
5. Supply Intercept		(1)/(2)^(4)	3.79
6. Production at Border Price		(5)*(3)^(4)	5.71
7. Decrease in Prod. @ Bord. P.	mt 000	(1)-(6)	0.29
8. Change in Price	cfa 000	(2)-(3)	39
9. Net Social Gain from Prod.	cfa million	.5*(7)*(8)	6
10. Decrease in government subsidy	cfa million	(1)*(8)	234
11. Decrease in Producer Surplus	cfa million	(10)-(9)	228
12. Social Gain/Producer S. loss	cfa	(9)/(11)	0.02

Table A.7.11. Es=.5

Item	Unit	Symbol	Estimate
Parameter			
1. Production	mt 000		6
2. Domestic Price	cfa/mt 000		100
3. Border Price	cfa/mt 000		61
4. Elasticity of Supply			0.5
Estimate			
5. Supply Intercept		(1)/(2)^(4)	0.60
6. Production at Border Price		(5)*(3)^(4)	4.69
7. Decrease in Prod. @ Bord. P.	mt 000	(1)-(6)	1.31
8. Change in Price	cfa 000	(2)-(3)	39
9. Net Social Gain from Prod.	cfa million	.5*(7)*(8)	26
10. Decrease in government subsidy	cfa million	(1)*(8)	234
11. Decrease in Producer Surplus	cfa million	(10)-(9)	208
12. Social Gain/Producer S. loss	cfa	(9)/(11)	0.12

Table A.7.12. Es=.9

Item	Unit	Symbol	Estimate
Parameter			
1. Production	mt 000		6
2. Domestic Price	cfa/mt 000		100
3. Border Price	cfa/mt 000		61
4. Elasticity of Supply			0.9
Estimate			
5. Supply Intercept		(1)/(2)^(4)	0.10
6. Production at Border Price		(5)*(3)^(4)	3.85
7. Decrease in Prod. @ Bord. P.	mt 000	(1)-(6)	2.15
8. Change in Price	cfa 000	(2)-(3)	39
9. Net Social Gain from Prod.	cfa million	.5*(7)*(8)	42
10. Decrease in government subsidy	cfa million	(1)*(8)	234
11. Decrease in Producer Surplus	cfa million	(10)-(9)	192
12. Social Gain/Producer S. loss	cfa	(9)/(11)	0.22

REFERENCES

Anders G., W. Firestone, M. Gould, E. Malek, E. Simmons, M. Versel, T. Ware, and T. Zalla. July 1984. Niger Irrigation Subsector Assessment. USAID/Niamey.

Binet B. July 1989. Rapport de mise en valeur: Karaigourou, Namarde-Goungou, Karma et Koutoukale. MAG/E ONAHA.

Briend R. September 1988. La culture cotonniere au Niger. MAG/E-ONAHA.

Boyer G. 1989. Mise en valeur hydro-agricole des terrasses du fleuve Niger. Volet developpement. Bilan de quatre campagnes de culture en milieu paysan. MAG/E ONAHA. FAC.

Casey F. May 1988. A Study on the Costs and Returns to Insecticide Use on Cotton and a Proposal to Reduce the Insecticide Subsidy. MAG/E DEP.

Casey F. July 1989. Memorandum. MAG/E DEP, ASDG.

Comite de Suivi de la Filiere Rizicole. 1989. Statistiques sur l'importation et le transit du Riz 1983-1988, Rapport de mission.

Dubasin J. September 1989. Rapport de mise en valeur. Toula, Daibery. MAG/E ONAHA.

CFDT. 1988.Rapport d'activite 1988.

CFDT. August 1987. Le coton en Afrique de l'Ouest et du Centre.

Deserranno G. August 1989. Suivi des prix et des quantites du riz et du mil sur les marches ruraux de la vallee du fleuve. MAG/E ONAHA, Direction regionale de Niamey.

Development Economics Group of Louis Berger International. March 1989. Final Evaluation, Agricultural Sector Development Grant, USAID Proj. No. 683-0246/47.

Gouvernement de la Republique du Niger/FAO. Seminaire national sur la politique de la filiere du riz au Niger. IPDR de Kolo, 25-27 Juillet 1989.

Gouvernement de la Republique du Niger/FAO. Seminaire national sur la politique de la filiere du riz au Niger. IPDR de Kolo, 25-27 Juillet 1989. Strategie de developpement de la filiere riz et politique economique agricole et de securite alimentaire au Niger.

Gouvernement de la Republique du Niger/FAO. Seminaire national sur la politique de la filiere du riz au Niger. IPDR de Kolo, 25-27 Juillet 1989.Situation, tendences et perspectives de la production de riz au Niger.

Hirsch, R. January 1988. Le riz et les politiques rizicoles dans les pays Africains de la zone d'intervention de la CCCE. Caisse Centrale de Coop ration Economique.

Jiron, Rolando, Luther Tweeten, Bechir Rassas and Robert Enochian. January 1988. Agricultural Policies Affecting Production and Marketing of Fruits and Vegetables in Jordan. Washington, D.C., Agricultural Policy Analysis Project (APAP).

Kohler, Daniel. May 1987. The Role of Energy in Irrigated Agriculture in Niger. Washington, D.C., CBY Associates, Inc.

Maliki B. January 1989. Etude sur la demande et la commercialisation du riz au Niger. GON UNDP/FAO pour le Seminaire national sur la politique de la filiere rizicole au Niger: IPDR de Kollo, July 1989.

Ministry of Agriculture and the Environment. May 89. Bilan d'ex cution des projets sous tutelle du Minist re de l'Agriculture et de l'environnement 1988.

Ministry of Commerce, Industry and Transport. February 1987. Etude relative a l'organisation de la filiere cotonniere.

Loutte T. April 1988. Rapport de suivi de l'impact Socio-economique des amenagements hydro-agricoles dans la vallee du fleuve Niger. Enquete SH 87. MAG/E- ONAHA. CSE-FED.

Loutte T. February 1989. Rapport d'evaluation de l'impact Socio-economique des amenagements hydro-agricoles dans la vallee du fleuve Niger.MAG/E ONAHA. CSE-FED.

ONAHA. February 1988. Riziculture irriquee, Statistique de base et recapitulatif 1980-1987. MAG/E ONAHA.

ONAHA. January 1989. Rapport d'acivit Annee 87/88. MAG/E-ONAHA.

ONAHA. January 1988. Rapport d'acivit Annee 86/87. MAG/E-ONAHA.

ONAHA. 1989. Seminaire National sur le d veloppement de l'irrigation au Niger. MAG/E-ONAHA.

Sim on M. October 89. Note sur la filiere rizicole. CCE

Tweeten, Luther, Bechir Rassas and Thomas Early. June 1989. Farm Prices and Incentives in the Yemen Arab Republic. Washington, D.C., Agricultural Policy Analysis Project, Phase II (APAP II).

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LIST OF ACRONYMS

ASDG	Agricultural Sector Development Grant.
ASDG II	Agricultural Sector Development Grant, Phase II.
BDRN	Banque de developpement de la Republique du Niger.
CA	Centrale d'approvisionnement.
CCCE	Caisse centrale de cooperation economique.
CFDT	Compagnie Francaise pour le developpement des fibres textiles.
CSPPN	Caisse de stabilisation des prix et perequation du Niger.
DEPSA	Direction des etudes, programmes et statistiques agricoles.
FAO	Food and Agricultural Organization.
FED	Fond Europeen de developpement.
FNI	Fond national d'investissement.
GON	Government of Niger.
IBRD	International Bank for Reconstruction and Development - World Bank.
KFW	Kreditanstalt feur Wiederaufbau (German Development Agency).
MAE	Ministere de l'agriculture et de l'environnement.
ONAHA	Office national des amenagements hydro-agricoles.
OPVN	Office des produits vivriers du Niger.
RINI	Riz du Niger.
RFA	Republique federale Allemande.
SONITEXTIL	Societe Nigerienne des textiles.
UNC	Union nationale des cooperatives.
UNDP	United Nations Development Programme.
USAID	United States Agency for International Development.

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