Poverty among Cotton Producers
Evidence from West and Central Africa

by Clarence Tsimpo and Quentin Wodon

In many sub-Saharan African countries household surveys are well designed to measure consumption and poverty as well as human development outcomes (especially in education and health) and access to basic infrastructure. But detailed information on the sources of income and the livelihoods of households and individuals are still often lacking. This is problematic because income data is essential to identify the links between growth and poverty reduction, to determine ways to improve household well-being, and to understand the potential impacts of economic shocks and policy reforms. In a context where countries as well as international organizations such as the World Bank are asked to document the potential poverty and social impact of the reforms that they propose (through so-called Poverty and Social Impact Analysis), it is important to encourage countries to start collecting data or to improve data collection on income sources.

To show how simple tabulations based on income sources data can inform policy debates, we consider in this note the case of cotton producers. World cotton prices (as measured by the Cotlook A Index) have been declining for most of the past decade, and farmers in West and Central Africa especially have suffered from lower producer prices paid to them by ginning companies in recent years. This has led to heated policy debates and difficult trade-offs for governments, as their desire to help producers is constrained by the need to avoid large subsidies that could lead to important budget deficits and ultimately threaten macro-economic stability and future growth. Using very simple statistical analysis, this note shows how the availability of income data has permitted the estimation of measures of poverty among cotton producers in West and Central Africa, as well as simulations of the impact that changes in producer prices may have on poverty. A brief discussion as to why producers continue to produce cotton despite low prices paid to them is also provided, together with some broad level suggestions for policy makers.

Poverty among cotton producers

Income data can first be used to identify cotton producers in household surveys (although this could also be done also with a simple question in the survey on who is a producer without the need to col-

Table 1: Poverty among cotton producers and distribution of cotton production by consumption quintiles for selected West African countries, various years (percent)

	Benin (2003)	Burkina Faso (2003)	Chad (2003)	Mali (2006)
Incidence of poverty				
Whole population	39.0	46.4	55.0	47.4
Cotton producers	53.3	47.2	72.7	77.8
Share of cotton production				
Bottom population quintile	22.0	13.1[a]	24.6	23.2
Bottom two population quintiles	44.4	32.3[a]	51.7	48.6
Bottom three population quintiles	65.9	49.9[a]	67.3	71.6

Source: Authors. Note: a. Data are from the 1997/98 priority survey.

lect detailed income data). The table below provides data for the "cotton-4" West African countries—Benin, Burkina Faso, Chad, and Mali. It suggests that cotton producers are on average more likely to be poor than the population as a whole, except in Burkina Faso. The differences in estimates of the share of the population in poverty between cotton producers and the population as a whole are very large in Benin, Chad, and especially Mali.

Data on income sources can also be used to assess crop production levels, since when the price paid to farmers is known, the quantity produced can be estimated from earnings data. In turn, data on quantities produced can be used to assess who would benefit from higher producer prices, or who would be hurt by lower prices The table above suggests that except for Burkina Faso, about two-thirds of cotton production is accounted for by households in the bottom three quintiles of the distribution of per capita consumption. Thus, about two-thirds of the additional income (or reduction in income) that would be generated by higher (lower) cotton producer prices would benefit (hurt) these households which can be considered vulnerable because many among them are poor and those who are not poor have con-

sumption levels fairly close to the poverty line. This type of information on the benefit incidence of cotton production is useful, because it can be compared to data on the benefit incidence of other explicit or implicit subsidies (or taxes), for example for various levels of education, for health, or for utilities such as electricity or water.

Impact on poverty of changes in producer prices

The same data can also be used to simulate the impact of changes in producer prices on poverty among producers and among the population as a whole. Consider for example the case of Benin in 2003, the year for which household survey data are available. In the World Bank poverty report for Benin, the extreme poverty line was set in relative terms at half the mean yearly consumption per equivalent adult (124974.5 CFA franc). The moderate poverty line was set at 166632.7 CFA francs, which corresponds to two thirds of that mean. This resulted in 39.0 percent of the population being poor at the national level, and 21.1 percent being extremely poor. Using these poverty lines, the analysis of the potential impact of different cotton producer prices on poverty both among cotton producers and in the population as a whole can be car-

ried in a very simple way: we measure the income obtained from cotton production by households, assess the difference in income that would follow from alternative producer prices, and assume that this difference in income translates into an equivalent difference in the consumption per equivalent adult of households used to measure poverty. More sophisticated methods could be used to measure the "general equilibrium" effect of a drop in cotton producer prices, but such simulations require a much larger number of assumptions which are the subject of debate. The estimations given here provide "first round" likely poverty effects from lower producer prices paid to households due to the drop in world cotton prices, assuming that households can't compensate their cotton income loss through other activities, at least in the short run (work on Burkina Faso has suggested that the ability of farmers to compensate for such losses is indeed limited).

Key results from the simulations are provided in table 2. The headcount index of poverty is simply the share of the population with a level of consumption per equivalent adult below the moderate poverty line. The poverty gap takes in addition into account the distance separating the poor from the poverty line. The squared poverty gap takes into account the square of that distance (and thereby the inequality among the poor). Similar definitions apply to the measures of extreme poverty, which are based on the extreme poverty line mentioned above. To interpret the data in table 2, it is important to note that in 2003, cotton produc-

ers were receiving around 180 CFA franc per kilo according to the survey. Today, due to the drop in world cotton prices, producer prices are lower. If for example, holding production levels constants, producers were to be paid only 130 CFA franc/kg the headcount index of poverty at the national level would increase by 1.4 percentage points, from 39.0 percent to 40.4 percent. This increase in poverty may be however underestimated as the total cotton production in the country that can be estimated from the data in the household survey was

with these measures of poverty which take better into account the impact of price shocks on poorer producers, the percentage increase in poverty from the initial level is larger than with the headcount index. Some observers might have expected an even larger impact of changes in producer prices on poverty. The main reason why the impact is not larger is that cotton producers typically derive only half their total income from cotton, and observed income in the surveys represent about half of the total consumption of the

other hand, cotton producers might also be able to diversify into other, more profitable crops, which would then reduce the negative impact of the drop in producer prices on poverty among them.

Broader issues

As mentioned in the introduction, given the above, governments are faced with a difficult dilemma. On the one hand, there is a desire on the part of governments to protect cotton producers from the downturn in prices, typically by allow-

Table 2: Impact of alternative cotton producer prices on poverty in Benin (2003 data)

	180 CFAF/Kg	170 CFAF/Kg	160 CFAF/Kg	150 CFAF/Kg	140 CFAF/Kg	130 CFAF/Kg	120 CFAF/Kg	110 CFAF/Kg
Extreme poverty, population as a whole								
Headcount index of poverty	21.1	21.4	21.6	21.8	22.1	22.3	22.5	22.8
Poverty gap	5.2	5.3	5.4	5.5	5.6	5.8	5.9	6.1
Squared poverty gap	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.4
Extreme poverty, cotton producers								
Headcount index of poverty	29.6	31.9	33.0	34.2	35.6	36.9	38.1	40.0
Poverty gap	7.2	7.8	8.5	9.2	10.0	10.8	11.7	12.6
Squared poverty gap	2.6	2.9	3.2	3.5	4.0	4.5	5.1	5.8
Poverty, population as a whole								
Headcount index of poverty	39.0	39.1	39.2	39.3	39.7	40.0	40.2	40.4
Poverty gap	11.3	11.5	11.6	11.8	11.9	12.1	12.3	12.5
Squared poverty gap	4.7	4.7	4.8	4.9	5.0	5.2	5.3	5.4
Poverty, cotton producers								
Headcount index of poverty	53.3	53.9	54.7	55.3	57.5	59.2	60.7	61.3
Poverty gap	15.8	16.7	17.5	18.4	19.4	20.4	21.4	22.5
Squared poverty gap	6.5	7.0	7.5	8.1	8.7	9.4	10.2	11.0

Source: Authors using Benin CWIQ 2003 household survey data.

slightly below the actual production in the country in 2003, hence the survey may have under-represented producers, or at least the quantity produced, which would reduce the simulated impact of the change in price on poverty.

The headcount index of poverty among cotton producers would increase much more, from an already higher base level of 53.3 percent to 61.3 percent. Increases are also observed for the poverty gap and the squared poverty gap, and

households (income is less well measured than consumption). Thus, a drop in producer prices of, say, 30 percent would on average for a typical farmer lead to a loss in consumption of only 7.5 percent. Of course, for some farmers, the loss will be much higher. Another important point to be mentioned is the fact that the losses could be larger, for example if there were negative spillover effects to the rest of the economy from the lower prices paid to producers. On the

ing the parastatal companies controlling the cotton sector in their country to continue to pay relatively high prices to producers. Because governments are the main shareholder in these parastatal, and must ultimately absorb any loss that the firms incur, maintaining high producer prices is essentially equivalent to providing a direct subsidy to cotton producers. Unfortunately, when national production of cotton is high, the cost of such subsidies is also high and

may lead to public deficits that threaten to affect the macroeconomic stability of the countries, as well as their ability to respond to other needs of the population, for example in the social sectors. There is no easy solution to the problem, but again, data on income sources from nationally representative surveys can at least help to clarify the trade-offs involved in various policy choices and simulate the potential impacts of these choices.

When deciding on a policy course, it is also important to keep in mind the short term as well as the long term effects of the decisions made. Even if it may make sense to keep producer prices higher than what the world market permits, and thereby to incur a loss for one year or two, this cannot be repeated from year to year to avoid providing wrong incentives to both ginners and cotton producers at high budgetary costs for the country. If world cotton prices remain depressed, as seems likely in the foreseeable future, incentives need to be given to producers to progressively shift to other crops or activities. At the same time, even if the base price is low, but still fluctuating, efforts should go toward designing appropriate mitigating and coping strategies for dealing with price shocks. To this end, governments and private stakeholders should work toward designing sector-based pricing mechanisms that help in reducing the magnitude of price shocks. When prices are higher, these mechanisms entail sacrifices in the short run (as producers and ginners set aside resources to provide funding for the mechanism for later downturns).

In Mali for example, steps were taken toward such a mechanism between the Government, producers, and CMDT in January 2005. First, the baseline price level for the campaigns 2005-06 up to 2007-08 was set at CFAF 160/kg to FACFA 175/kg, which was more in line with expected future prices than the level of 210 CFAF/kg that prevailed at the time. Second, a formula was adopted to define the producer price as a share of the world benchmark price, after taking into account a number of cost and efficiency variables related to the processing and commercialization of cotton. A key objective was to ensure that producers receive about 60 percent of the income generated by the sector, the other 40 percent going to the national parastatal. Third, the pricing mechanism agreed upon by the parties included a measure designed to fund a stabilization fund.

Beyond measures designed to deal with producer prices, the high level of poverty observed among producers begs the question as to why farmers continue to produce cotton in West and Central Africa despite low producer prices and the fact that they remain rather poor? This is a complex issue, but at least five main reasons may explain this apparent paradox. First, to produce cotton gives producers the certitude they will get a monetary income at a predetermined moment. This income helps producers to face current and unexpected expenses (for example for health or education). Cotton production offers a certain security despite low prices, with the guarantee that parastatal companies will buy the whole production and that they will be paid relatively

quickly. Second, to produce cotton gives access to credit. And producers need this credit not only to get access to inputs but also to improve their productive material or for consumption purpose. In most countries, the banking system and the micro-finance institutions do not deliver credits to farmers who do not produce cotton. Access to credit in rural areas usually goes through guarantees linked to the production of cotton. Third, to produce cotton gives farmers access to inputs, again through the parastatals. Farmers need those inputs for cotton production but they also use parts of the inputs for cereals production which matters for food self-sufficiency. Fourth, to produce cotton gives farmers access to some training and education concerning new varieties, technical improvements, etc. Finally, cotton production in any given year has positive "afterwards effects" on cereals yields in the next year as the use of chemical and/or natural inputs needed for cotton improve ground fertility at crop rotation time. In other words, to pertain to "the cotton club" brings many advantages to peasants, which may explain why most of them continue to produce cotton, at least for some time, despite the fact that producer prices are going down.

Is cotton production going to be profitable at the lower prices that are now paid to farmers across West and Central Africa? Limited data are available to assess how profitable cotton production is to farmers. The analysis of a survey of cotton producers implemented in Mali in the summer of 2004 suggests however that only those producers who are better equipped

make a substantial gain on their production. More precisely, while in the 2003-2004 campaign, the nominal price paid to producers was 190 CFA franc/kg, the net price received was of the order of 100 CFA franc/kg. The main costs that explain the difference between the nominal and net prices are the costs of inputs provided by the parastatal company (estimated at about 70 CFA franc/kg in the survey, but other data suggest that this cost may in some cases reach 90 CFA franc/kg, which is high), and the reimbursement of loans to the parastatal (in most cases) at about 15 CFA franc/kg. Other costs not related to the services provided by the parastatal include cotton land maintenance costs, cotton harvest costs, and cotton transportation costs, as well as broader investment costs, production costs, and taxes and fees. Overall, these costs vary from 43 CFA franc/kg to 131 CFA franc/kg depending on the method used for allocating part of these costs to the production of cotton as opposed to other crops, and depending on the type of producer considered. A key finding was that producers belonging to the better equipped groups were the most profitable. For poorer households who do not have good equipment, cotton production is less advantageous. This means that poorer households could very well be those who will stop production if prices remain low for long periods of time, but at the same time these producers also need probably the most the cash income that is provided to them by the cultivation of cotton.

Conclusion

The objective of this note, which was prepared as a background piece for a publication on data and development indicators in Africa, was to show that income data from nationally representative household surveys can be very useful in order to inform policy. Without income data, it is very difficult to identify the links between growth and poverty reduction, to determine ways to improve household well-being, and to understand the potential impacts of economic shocks and/or policy reforms. In order to demonstrate how simple tabulations based on income data can inform policy, a case study on cotton producers in West and Central Africa was presented. The data suggest that cotton producers tend to be much poorer than the population as a whole, and that about two thirds of the production of cotton in Benin, Burkina Faso, Chad and Mali is accounted for by producers who are poor or near-poor. This means that about two thirds of the subsidies given to producers (or taxes levied on them) would benefit (or hurt) vulnerable households. We have also shown that while changes in producer prices may not have a very large impact on national poverty measures, they do affect cotton producers in a significant way, even though on average these producers tend to have only half their total income generated by cotton (and observed income in the surveys represent half of the total consumption of the households).