Household Responses to Declining Food Entitlement: The Experience in Western Sudan

Tesfaye Teklu[1]

Introduction

Studies that provide insights on household coping behavior during food crises are emerging with key findings (see, for example, [6], [3], [1], and [2]). Household responses are seen as involving substitutions between and within consumption, income, and asset paths, with discrete shifts between these coping paths. Households vary in their emphasis on choices among these paths. In general, households prefer to avoid actions that would endanger their future survival. However, success with coping is unequal across households.

These studies are less conclusive in explanining the ordering of coping strategies (paths) and associated responses. The focus used to be on developing a stylized set of ordered responses, but this is a tenuous exercise, since the choice and timing of responses are time dependent and household-variant. This paper attempts to contribute to an understanding of the process of household coping strategies and responses to declining food entitlements.

Part 1 of this paper reviews the recurrence of droughts and famine outcomes in the area, presents a typology of a household economy, and identifies patterns of coping response in the context of the 1984 - 85 famine. Part 2 surveys the dynamics of recovery in the post-famine period and draws the implications for sustainability of coping capacity. Part 3 discusses the role of public intervention in recovery and protection of coping paths. A famine-prevention strategy for Sudan needs to recognize the time path of the coping process and its associated costs.

1. Coping With Recurrent Droughts

Recent reviews ([4] and [8]) of historical records show that periods of drought have occurred throughout the history of famine in Sudan. For example, the two great famines of 1888 - 89 and 1984 - 85 were triggered by consecutive years of poor rains. Farmers in western Sudan have identified 36 years between 1912 and 1974 as being years of drought (4). Half of these 36 drought years were meteorologically confirmed with rainfall well below average.

1.1 Coping Paths

Farm households in such a drought-prone environment have developed a flexible structure to absorb periodic production and income shortfalls. Typically, a sedentary farmer is endowed (self-provisioned) with his or her own resources, particularly labor (Figure 1). A great proportion of household resources goes into crop production - both food and cash crops. In addition, some family labor is used to generate other income to supplement crop income. Household income, at any particular point in time, is a combined outcome of these income sources.

Income generated from these sources is translated into consumption and asset accumulation. Food consumption is presumed to impact on household nutritional status, which, in turn, influences the incidence of morbidity and mortality in interaction with sanitary and health environments.

Figure 1 displays various paths of adjustment available to the household: production, migration for off-farm work, asset, income, and consumption paths.

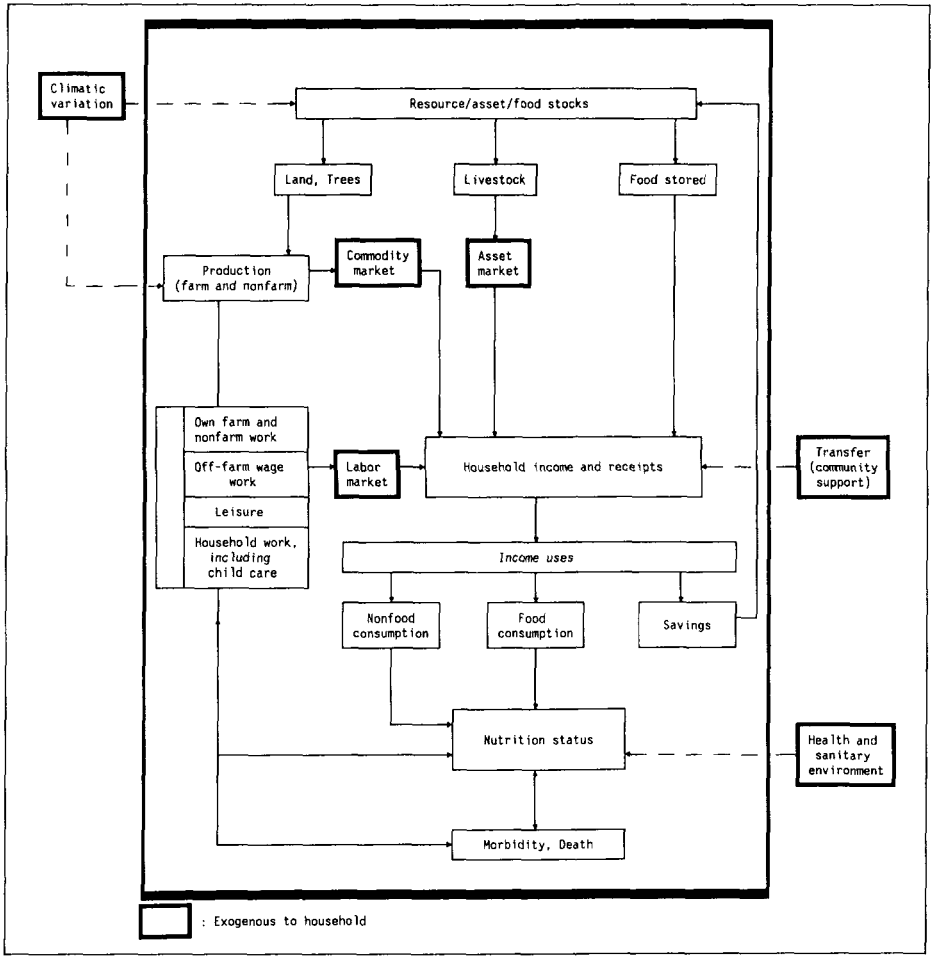
Exogenous changes to the household (for example, changes in climate, market, or public policies) are accomodated through substitution within and between these paths.

1.1.1 Production Path

Responses within the production path involve shifts in crop mix, changes in inputs, and variations in planting practices. Farmers, in general, prefer to maintain a diversified crop portfolio. In areas where market transaction costs are prohibitive, as in western Sudan, farmers maintain food crops to ensure their household subsistence. Crop diversity also allows farmers to easily adjust their production timetable to varying rainfall patterns.

In addition to committing their land and labor to multiple crops, farmers also vary their use of other inputs and planting practives. Typically, farmers shift to drought-resistant and short-maturing varieties during persistent drought conditions. Ibrahim (4), for example, has identified as many as 19 seed varieties in eastern Kordofan and Darfur. Low water-holding capacities of soils in the sandy zone means that farmers begin planting before the onset of the first rain (*remail*) to capture early showers[2]. Overplating often takes place to ensure that some area is finally harvested. Moreover, because of high local variability of rains, it is common to plant different crops in different areas of several fields.

Figure 1: Paths of household response to declining food entitlement



1.1.2 Migration Path

Sedentary cultivators normally leave their home villages at the end of the harvest season (January or February) in search of wage employment. In normal years, the migration rate per household ranges from 13 % to 20 %. The rate is higher among males aged 16 to 40 years.

Migrants often move from western Sudan to the Central and Eastern regions in search of wage farm employment, especially in cotton farms in the Gezira irrigation scheme. A smaller percentage of the migrants, on the order of 5 % to 10 %, move to urban

areas in these regions. No less than 10 % also move to better rainfall areas in the south, especially to the mechanized farms of Southern Kordofan. Dry-season migration comes to an end when migrants return to their farms at the beginning of the wet season (May or June).

According to the IFPRI study (9), migration began much earlier than the normal migration in the 1984 - 85 period. The rate of individual and whole family migration sometimes reached 74 %. Large-scale movements involving whole families were indicative of the distress phase of migration. Most of them moved to nearby towns and major cities.

1.1.3 Asset Path

Ownership of livestock represents a principal component of household assets. Farmers often maintain a diversified herd composition to ensure self-provision of food, income, and transportation. In addition, possession of animals with varying degrees of resistance to drought is designed to minimize losses.

During times of severe drought, farmers strive to protect a minimum viable number of livestock. As observed in North Kordofan in 1984 - 85, farmers shifted to purchase feeds as natural pasture became short. At times, a partial sale of their livestock was required to finance purchase of feeds. The off-take rate for animals rose as drought intensified, which often involved sale of animals not destined for the market. Farmers also had to split their stocks and send some animals to distant, better grazing areas - a practive rarely practived by sedentary farmers, particularly small herd owners.

1.1.4 Income Path

In a "normal" agricultural year, like the 1988/89 season, crop production and livestock husbandry are the major sources of income, accounting for about half of total household income. Wage income contributes nearly 10 %. The balance comes from nonagricultural activities and transfers.

Household income is characterized by large seasonal variations. The annual flow of income normally rises and peaks during the harvest season when farm production is at its height. Nonagricultural and migrant off-farm wage incomes are substitutes during the dry season. The period immediately preceding the harvest is critical: food and cash savings are exhausted, and off-farm wage employment opportunities are limited. Farmers then engage in borrowing, selective selling of their livestock, and adjustments in their diets.

A similar strategy of income substitution is followed when farmers face failure of their crop income. When farmers experienced a large decline in real income in 1984 - 85,

due to a decline in production and a rapid increase in food price, they had to resort to a large-scale liquidation of assets, and had to depend greatly on home production, collected products, and transfer income. Unlike the usual predictable seasonal pattern, such a shift in income sources was less regular and more widespread with high intensity.

1.1.5 Consumption Path

Food accounts, on average, for 70 % of a household budget in a normal year. The major diet component centers on cereals, particularly millet.

Food crises may set in motion adjustments in the consumption path, which may involve budget reallocations. A decrease in income induces an increase in the share of the budget allocated to staple foods. Similarly, an increase in price is accompanied by an increase in the staple-food budget share. The only factor that offsets the increase in budget share is the impact of a decline in family size, which is commonly practiced among the poor. However, the size effect is relatively weaker than the income and price effects.

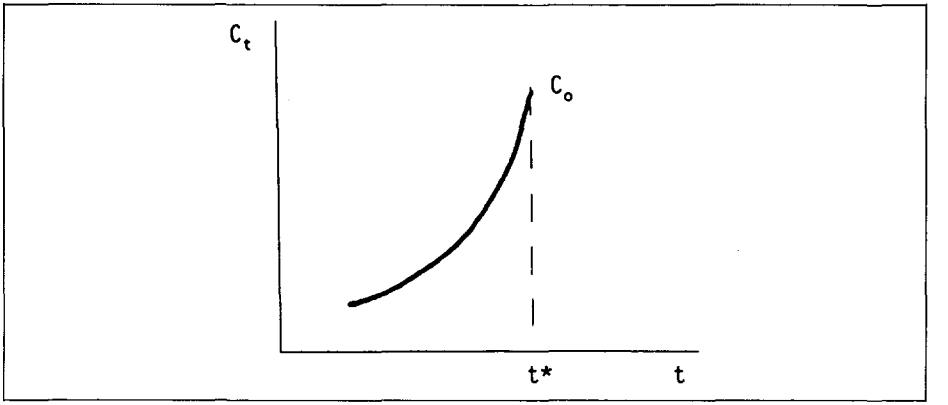
Drought-induced income and price changes impacted on the rural population to make a significant shift in their consumption pattern. The composition of diets shifted from the usual millet-based diet to sorghum, wheat flour, and wild cereals and tree fruits. Twenty-seven percent of the sample resorted to consumption of wild rice and tree fruits. Fifty-nine percent of these indicated that they would not have consumed these food items in a normal year. Families had to cut the frequency as well as the size of meals to ration their food consumption. About 70 % of IFPRI sample households reported that they had to cut their meal size. One out of three survived on a single meal. Approximately a quarter of the sample subsisted on a reduced single meal.

1.2 Coping Phases

Distinct phases are descernible as these coping paths shift their relative position. In effect, the switching points at which these relative shifts occur mark an evaluation and revision of weights attached between current and future consumption goals. If an approximate continuous cost curve is defined relating adjustment cost (in terms of future foregone consumption) to a time scale, the curve represents a strictly increasing cost function with time. Consider Figure 2. The vertical line measures the cost of adjustment, C_t. Time is measured along the horizontal line, t. The curve, C_0, is upward sloping, since there is no cost-free adjustment. The slope rises slowly at the early phase, but gains rapidity as the coping process moves from the low-cost to the high-cost time phase. That is, the cost of adjustment at the margin increases as the magnitude of future foregone consumption rises due to deterioration of assets, increased current indebtedness with claims on future income, and current uneconomic

use of productive labor time. In fact, the slope approaches infinity as the time path approaches the critical time period t* (point of starvation), that is, $dc/dt \rightarrow \infty$ as $t \rightarrow t^*$.

Figure 2: Time Variante Response Cost Curve



Note: The particular location of the cost curve is contingent on initial coping endowment. For the poor, the location moves to the left of C_0 which indicates a shorter coping lag time or a higher incremental cost at every point in time

The magnitude of the relative shift between coping phases along the cost curve varies depending on the source, persistence, and phase of the process. If, for example, a process is triggered by a one-time drought, minimization of production loss may become a main adjustment path. If, however, such a drought was preceded by other droughts, with insufficient time for households to restore their lost coping capacity, or if a drought persisted too long without sufficient prevention, the key path of adjustment shifts to management of the asset path. If this path coincides with little community support or unfavorable market conditions, a household's capacity to cope is likely to shrink rapidly.

While there are discrete shifts in coping paths, responses within these paths may take place simultaneously across all paths (see, for example, Table 1). In the early stages of a food crisis, responses are akin to regular and predictable preventive measures - shift in cropping mix, migration in search of wage employment, sale of less-desired animals, increased interhousehold transfer, and shift in food-budget and diety components. As the food crisis deepens, responses involve increased rates of migration, disposal of prime productive assets and personal possessions, and a greater reduction in the consumption level. The persistence of adverse conditions may trigger a final stage that is often marked by large-scale distress migration in search of relief.

Table 1: Time path of drought coping responses in Western Sudan

Source of Adjustment	Stage of Responses: Early	Immediate	Final
Production	— Change in cropping and planting practices — Increased nonfarm home production	—	—
Labor	— Migration in search of employment — Shift to petty trade	— Migration in search of employment (intensified in face of falling expected wage rate) — Separation of familiy	— Distress migration — Separation of family (possibly permanent)
Assets/capital	— Sale of small stock (liquid, easily reversible) — Sale of large stock (nonessential)	— Sale of productive assets (livestock, tools, land) in depressed market	—
Loans/transfers	— Use of interhousehold transfers and loans	— Credit from merchants and moneylenders	— Donation (relief) assistance)
Consumption	— Switch in expenditure/ dietary composition — Reduction of current consumption level (cut in frequency and/or lower size per meal) — Adjustment in intrahouse-hold allocation	— Reduction of consumption level (greater dependence on market)	— Reduction of consumption (survival may be threatened)

Again, the order of responses within the coping paths follows an upward-sloping cost structure. At the early stage of a food crisis, respones resemble regular seasonal patterns. As the gap between normal and survival food intake narrows and the opportunity cost of protecting future income streams becomes high, households intensify high-cost and less-reversible responses. For example, within the asset path, responses may involve a shift from sale of assets that are maintained primarily to buffer income to disposition of productive assets. Consumption responses may begin with a reallocation of the household budget toward food and rationing of food consumption (adjustment in diet composition, meal size, and intra-household distribution), and then move progressively to lower levels of food intake.

1.3 Variation in Coping Capacity

Although poverty is widespread, it is not uniform among the farm population. The 1989 IFPRI survey in central Kordofan shows that the high-income group has income levels that are four times higher than the lowest group. Examination of factors contributing to interhousehold income variations shows that wealth and size of labor force have a major influence on household earned income (9). A gender bias is also observed in income variation - female-headed households earn much lower income than male-headed households. In addition, income level is location specific - households from drier areas earn lower income.

Although households face a great risk of income failure due to a large share of rainfall-dependent agriculture income, the presence of nonagricultural income and transfers plays a crucial stabilization role in a period of falling agricultural income. To the extent that access to these protective income sources varies across households, households face unequal risks of income failure. Moreover, a closer look within these protective income sources shows that the poor are dependent on collected or gathered products, while the rich are dependent on transfers. Hence, the source of risk for the poor is connected largely to what happens to the local environment, whereas for the rich the risk is spread to what happens to the nonlocal economy. The dependency of the poor on local vegetation has in fact a much higher cost in terms of sustainability of the environment.

The burden of coping is unequal among households, largely due to variation in the level and correlation of income sources. A great proportion of those households with low coping capacity may be from the poor. A dichotomous logit probability decision model fitted to IFPRI sample-survey data indicates that the decision to migrate was high among the asset-poor, families with many dependents, and those with little access to water (9). Distress sale of assets, livestock in particular, was intense among small herd owners who were tightly constrained by rapidly declining income capacity. Since the poor had a large food budget share, the scope for maintaining food consumption levels by shifting from nonfood budget was limited. They had, therefore, to resort early to cut their meal size and subsist on a reduced single meal. Those persons with low body adaptability, in particular, were at high risk. The reduced level of consumption and high incidence of disease contributed to a large decline in nutritional status, especially among the infants and children.

2. Limits to Recovery: Potential for Public Intervention

When farmers were asked in 1989 if there were any ways in which they were trying to protect themselves from the possibility of future hunger, they confirmed, by and large, their desire to continue their past strategy of production and income diversification. The primary goals in their recovery drive were the reconstitution of their livestock base, increase of their crop production and food stocks, and access to the nonlocal economy

(in terms of income through migration and transfers from outside the community). Hence, what happened to these key income sources and their determinants are crucial pointers to the direction and extent of the recovery as well to the sustainability of coping capacity in the post-famine years.

The IFPRI sample survey indicates that per capita herd size dropped by an average of 86 % between 1983 - 85. Since 1985, herd growth has remained low. The average annual growth rate is 14.9 %, but note that it is from the low base of 1985. Two factors contribute to this low growth rate: first, the high cost of replenishment that farmers continue to face, especially of large animals; and second, the importance of the income from sale of animals as a buffer for low and variable crop income.

The pressure to dispose of animals continues in the face of recurrent crop failures. A major factor behind this pressure is the low and uneven distribution of rainfall. While above average rainfall was received in 1985, the northern drier areas of Bara district registered the lowest level on record. In 1987, a long dry spell contributed to a large production shortfall. In 1988, when rainfall levels were considered normal, some areas experienced flood conditions as the rain was distributed over fewer days at high intensity. These areas have become more prone to pest infestation and diseases, and crop loss due to pest infestation ranges between 15 % to 25 % in any crop year.

Growing labor shortages have also become an important factor behind the pressure to dispose of animals. The changing pattern of migration has contributed to this tendency. Although the migration rate per family has returned down to the long term average, more families participate in the migration now compared to the past. Secondly, permanent out-migration, especially from the northern drier areas, shows signs of increasing. A continuous drain of working adults has resulted in an increase of female-headed households, especially in the northern areas. Thirdly, migration is becoming a widely adopted early coping response, as wealth level remains low and unstable and the number of families with large dependents increases.

Permanent out-migration and a high propensity to migrate pose a critical problem, especially for capital-constrained labor-deficient families. Because of a tight income position, particularly during the wet season, these families are forced to work off the farm. To cope with their own farm labor shortage, they have to cut the level of farm labor intensity (labor input per area) and/or increase utilization of female and child labor. In some cases, they rent out their land for lack of labor. The incidence of such phenomenon has been particularly noticeable among female-headed households, where males are absent.

A sharp peak in the distribution of rainfall (that is, a concentration of rainfall over a fewer number of rainy days) has compounded the growing problem of labor shortage. In an environment in which the soil has a low water holding capacity, the demand for labor has a strong symmetrical relationship to the distribution of rainfall. Labor has to be present during the critical rainfall-driven periods of farm operations. The demand

for labor thus gets tight as the rainfall distribution gets concentrated. This can have detrimental effects on production if it occurs at a time of declining labor force in rural areas. A manifestation of such a phenomenon is the rapid increase in wage rates for the sesame crop harvest in 1988.

Frequent occurrences of drought have precluded households from restoring their principal sources of income - sustainable crop production and asset income. A common recourse, then, is to shift to other income sources such as nonagriculture sources and transfers. Of course, the extent of such a shift is inversely related to the share of agricultural income in total income. The relatively high proportion of income from the sale of gathered products within nonagricultural income sources poses a conflict with long term sustainability of the environment - the poor tend to largely discount the future to ensure their present subsistence. Transfer income, the only important nonlocal income source, provides protection, but its sustainability is affected by the performance of the rest of the economy. In general, the current protective income sources appear to be easily reversible and non-sustainable.

Emerging landlessness appears to add to the marginalization of the rural poor. There are indications of increased north-to-south movements within the region in search of better land and water. For example, whole families in one of the ten IFPRI survey villages were recent settlers who largely occupied land rented from the original villagers who had also moved southward to the central belt of the region. Some 35 % of these recent settlers had no land to cultivate in the 1988 crop year. As many as 15 % of the sample households were without land in some of the other villages. War refugees from southern Sudan add another dimension to this development. Increased landlessness is also observed among farmers who are squeezed out because of inheritance practices[3].

Consequent to these changing tendencies in the rural economy, farm households have become more dependent on the market. With a continued decline in food production, there is greater acquisition of food from market sources. The same force has contributed to high rates of sale of livestock, especially of small animals, which are largely built up by births. An increase in labor market participation and a shift to service-oriented occupations on a more permanent basis is also observed. The latter is partly a conscious effort to de-link from the local agriculture-based economy so as to reduce exposure to risk[4]. In addition, the income diversification strategy involves increased commercialization activities. There is a greater propensity to live on collected food and selling of firewood and charcoal. Women, in particular, are also involved in trading and commercial activities, for example, of beverages, cooked food, and vegetables.

These developments in the post-famine years have an important bearing for the pattern and dynamics of household-based coping behavior. First, the array of responses available to households is diminished because of falling crop production, diminishing asset base, and deteriorating local vegetation. Indicative of this phenomenon is the adoption of high-cost responses in the early phase of coping activity in the

present drought - an indication that the cost curve in 1990 - 91 has shifted to the left of where it was in 1984 - 85. Examples of high-cost responses are the sale of productive female animals and greater migration at early stages. Second, the lag time required between path-switching points is quite reduced due to the thinness of coping paths. The place of production and assets as important coping paths appear to be greatly diminished. Instead, the emphasis has shifted to more diffused bands of nonagricultural income sources and transfers. An indication of such a trend is the current emphasis on outside support (migrant remittances and relief food). Third, there are also changes in the sources of risk with shifts in the relative position of these paths. With greater dependency on the market for the purchase of food, and, in particular, the sale of assets and labor, market risk is heightened. Where markets are thin and market stabilization policy is weak, price swings are high. Price swings are even worse where access to market is absent due to war, lack of infrastructure, and trade control. Finally, because of a much weakened coping base and a diminished access to the community support network, early and effective public support has become crucial.

3. Role of Public Policy

Public policy must recognize the existence of a household-based coping process. It must also recognize the dynamics of the process - the various phases of its development, factors that cause and condition these phases, and the context within which the process evolves. Frequent public responses to emergency situations simply reveal a lack of proper understanding of the time path of coping process.

In the context of a household framework, a famine prevention strategy should be derived from a correct understanding of household intertemporal goals and preferences, as well as of constraints. Given the current economic status of the rural population in Northern Kordofan, policy goals should focus on: (1) immediate intervention to support basic survival responses at consumption and nutrition end (that is, provision of relief food, health and sanitary support, and food/cash for work); (2) restoration of primary coping paths (production, asset, and migration); and (3) protection of coping base to minimize costs of responses to individuals as well as to society. After all, an effective public policy is measured by containment of coping to low-cost paths and responses.

Central to the recovery and development of the primary coping paths is agriculture-based growth strategy (9). This may be tailored in the context of the current agro-ecological determined zonal planning framework for Northern Kordofan (5), which emphasizes livestock production and management in the low rainfall zone and crop production in better rainfall in the central zone. In addition, key complementary policy actions are necessary to restore, develop, and protect the environment, to improve the physical and social infrastructure, and to promote functioning stable markets. A well-placed macroeconomic policy plays an important role in such context, especially

in light of the increased integration into the nonlocal economy within a market framework.

There must also be public policy to protect coping capacity. The need for such policy has become greater in the context of the dynamics of famine that was observed throughout the 1980s. Thinness of coping responses, especially livestock as an important income buffer, reduction in time-span of coping phases, and increased dependency on missing or thin rural markets have placed high cost premiums on the timeliness of public interventions. Such interventions have to reach larger segments of the population because of increased marginalization and persistence of food insecurity incidence in rural areas. The capacity for socioeconomic targeting is quite diminished due to a rapid shift in temporal income sources (much diffused at present because of concentration on large bands of nonagriculture income sources and transfers), and large variability in income levels (7).

A famine preparedness policy should be based on four pillars: (1) comprehensive employment generation (labor-intensive development strategy including expanded public works programs in time of crisis); (2) supportive income maintenance programs (such as provision of feeding programs; subsidized food, fodder, water and transportation; and access to soft term loans); (3) preventive health and sanitary support; and (4) effective market intervention to guarantee supply and price stabilization (accumulation of foreign exchange, removal of trade controls, and intervention to defend price bands). For this to be in effect, there should be a permanent institutional capacity in place to detect and diagnose indicators of stress, prepare programs and projects on a continuous basis, and execute them in time of revealed needs. Decentralized administration is crucial to tie detection and action at the same level.

There are, of course, a set of preconditions for initiation and implementation of these policies. Today, famine is common not only in poor and crisis-prone environments, but also where there is armed conflict. War not only disrupts coping mechanisms, but threatens the survival of household as viable social and economic units. Cessation of war should be a top priority (10).

Concluding Remarks and Summary

Farm households operate a multipath diversified economy to attain their twin goals of promotion and protection of intertemporal consumption objectives. To deal with seasonal and periodic production and income shortfalls, they adopt conscious and planned coping strategies. In general, these strategies are taken in progressive phases following an approximate increasing cost curve. There are, however, variations in success. Those households with the least level of preparedness are at the highest risk.

In most cases, households have demonstrated their capacity to utilize their coping strategies and responses effectively to avoid severe declines in their entitlement and to promote their ability to survive. However, frequent occurrences of famine conditions in recent years have eroded their array of responses and, thus, forced them to engage in early adoption of high-cost responses. Increased dependency on thin and poorly connected (or protected) markets, in addition, has diminished the effectiveness of their coping capacity. In particular, the events of the 1980s have raised doubts on the sufficiency of these coping responses without early and timely public support.

An improvement in household coping capacity and process promises an efficient private sector solution for the recurrent episodes of famine. As such, public policies must recognize the existence, structure, and dynamics of household coping process. Policies must promote, facilitate, and protect the efficiency of these responses. Famine prevention must be seen in the context of a development process that also integrates relief and rehabilitation. The long-term strategy should focus on enhancing coping capacity through improved economic policy. In addition, there must be permanent public preparedness to protect gains from the long term growth process. In the very short run, however, it is urgent to intervene to permit basic survival responses at the consumption and nutrition end. Timeliness of public response has become critical in light of the rapidly diminished private coping base.

Zusammenfassung

Landwirtschaftliche Haushalte in Entwicklungsländern wenden vielfältige ökonomische Strategien an, um ihre gegenwärtigen und zukünftigen Konsumziele zu befriedigen bzw. auszuweiten. Dazu gehören eine Reihe gezielter Anpassungsmaßnahmen (*'coping strategies'*), um saisonale und sonstige periodische Produktions- und Einkommensschwankungen auszugleichen. Die einzelnen Maßnahmen werden dabei entsprechend ihrer Kosten im Rahmen einer ansteigenden Kostenfunktion eingesetzt. Haushalte sind jedoch unterschiedlich erfolgreich in ihren Bemühungen: je weniger Vorbereitungen getroffen werden, desto höher das Risiko.

Ländliche Haushalte haben sich überwiegend als sehr effizient erwiesen, geeignete Anpassungsmaßnahmen zur Stabilisierung zumindest ihres Basiskonsums zu entwickeln und ihre Überlebenschance zu erhöhen. Wenn jedoch, wie dies im letzten Jahrzehnt im Sudan der Fall war, mehrere Krisen dicht aufeinander folgen, verringert sich die Anzahl potentieller Anpassungsmaßnahmen schnell, so daß Haushalte *gezwungen sind, relativ kostenaufwendige Maßnahmen zu ergreifen.*

Ein weiteres Problem besteht darin, daß ländliche Märkte häufig nicht befriedigend funktionieren bzw. vollständig versagen, was die Fähigkeit der Haushalte, auf temporäre Einkommensschwankungen angemessen zu reagieren, stark beschränkt. Ereignisse während der 80er Jahre im Sudan führen zu erheblichen Zweifeln, ob

mikroökonomische Anpassungsmaßnahmen ohne rechtzeitige öffentliche Unterstützung einen ausreichenden Schutz für die betroffenen Haushalte gewähren.

Eine umfassende Strategie zur Vermeidung von Hungersnöten sollte kurzfristig wirksame Nothilfe-Maßnahmen einschließen, während langfristig darauf abgezielt werden sollte, die Fähigkeit der Haushalte zu geeigneten Anpassungsmechanismen durch eine insgesamt verbesserte Wirtschaftspolitik zu erhöhen, und der Absicherung wirtschaftlicher Fortschritte erhöhte Aufmerksamkeit zu widmen.

Notes

1. Research Fellow at the International Food Policy Research Institute, Washington, D. C., U.S.A. The author thanks Joachim von Braun and Hannan Ezekiel for their useful comments, and Rajul Pandya-Lorch for her editorial assistance.

2. Another important factor is the response to a sharp rise in demand for farm labor in time of rains. Since failure to meet this demand is detrimental to crop production, farmers start planting before rains to circumvent a shortage of labor. This practice allows them to spread out the work load for labor.

3. A manifestation of increased population movements to better agricultural areas of the central zone is observed in increasing trend of land rent in the 1980s. There is also an increasing shift in rental arrangements from sharecropping to cash payment because of concern with large fluctuations in crop production.

4. Such an effort to de-link has a potential conflict with desired linkage effects of agriculture-based development strategy. If migrant labor moves outside the rural economy, which has little link to the local farm economy, the risk is much minimized. But this is not consistent with desired strategy for promoting service economy that is linked to the agriculture economy.

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