LABOR-INTENSIVE PUBLIC WORKS FOR FOOD SECURITY: EXPERIENCE IN AFRICA

by

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TABLES

ILLUSTRATIONS

ACRONYMS AND INITIALS

ADP	Agricultural Development Projects (Nigeria)
AfDB	African Development Bank
AGETIP	Agence D'Execution Des Travaux D'Interet Public Contre Le Sous-Emploi (Senegal)
BIDS	Bangladesh Institute for Development Studies
CFF	Cash-for-food (cash-for-work)
CRS	Catholic Relief Services
DFRRI	Directorate for Foods, Roads, and Rural Infrastructure (Nigeria)
EEC	European Economic Community
EGS	Employment Guarantee Scheme (Maharashtra State, India)
ESSEC/CEDRES	Ecole Supérieure des Sciences Economiques/Centre d'Etudes et de Documentation pour la Recherche en Economie Sociale
FAO	Food and Agriculture Organization of the United Nations
FEWS	Famine Early Warning System
FFW	Food-for-work
FRG	Federal Republic of Germany
GDP	Gross domestic product
GNP	Gross national product
GOB	Government of Botswana
GOBF	Government of Burkina Faso
GOC	Government of Cameroon
GOE	Government of Ethiopia
GOK	Goverment of Kenya
GON	Government of Niger
GOR	Government of Rwanda
GOS	Government of Senegal
GOT	Government of Tanzania

GOZ	Government of Zimbabwe
GTZ	Gesellschaft für Technische Zusammenarbeit (Germany)
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
ILO	International Labour Organization
LWF	Lutheran World Federation
NDE	National Directorate of Employment (Nigeria)
NGO	Nongovernmental organization
NIGETIP	Agence Nigerienne De Travaux D'Interet Public Pour L'Emploi (Niger)
ONAREF	National Office for Forestry Development (Cameroon)
ONCCP	Office of the National Committee for Central Planning (Ethiopia)
PACSA	Programme d'Attenuation des Couts Sociaux de l'Adjustement (Niger)
PDP	People's Development Program (Burkina Faso)
RARP	Rural Access Road Program (Kenya)
RRC	Relief and Rehabilitation Committee (Ethiopia)
RDF	Rural Development Fund (Kenya)
SAP	Structural Adjustment Program (Nigeria)
SPWP	Special Public Works Program (ILO)
UNACC-SCN	United Nations Administrative Committee on Coordination-Subcommittee on Nutrition
UNDP	United Nations Development Program
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WPF	World Food Programme

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EXECUTIVE SUMMARY OF POLICY FINDINGS AND CONCLUSIONS

1. Three central problems facing Africa today—food insecurity, growing unemployment, and poor infrastructure—need to be, and can be, addressed simultaneously by appropriate action through labor-intensive public works programs. Labor-intensive public works promise to go a long way towards direct and sustainable poverty alleviation and strengthening of self-help capacities. Targeted food, income, and health interventions, along with public works programs, emerge as complementary instruments for improving economic growth, food availability, and nutrition in many African countries. While agricultural growth, in general, and increased food production, in particular, remain vital to food security through their income and employment multiplier effects, public policy responses to food security problems must be based on a broader set of policy instruments. The purpose of this study (Phase I of a much larger research undertaking) is to outline how to achieve these goals using public works programs as an instrument, and how to provide an improved basis for shared learning from the experience in this field in Africa and elsewhere. A second phase of this research will entail primary data collection at a household level relating to the impact of labor-intensive public works in four African countries.

2. Public works activities, as defined in this study, are the provision of employment through public programs. Mobilization of labor occupies a prominent role in such programs, designed to create viable assets on which future development can be based. Typically, they generate public goods, for example, infrastructure, but private goods may also be generated. Labor-intensive public works programs, while publicly supported, need not necessarily be implemented by the public sector. Food security means households' permanent access to food in sufficient quantity and quality for an active and healthy life.

3. The potential for labor-intensive public works programs is enhanced by deficient and deteriorating infrastructure, combined with the increasingly urgent need to deal with resource degradation. At the same time, the demand for participation in public works programs is

rising because of rapid population growth and its concentration, low or even negative absorptive capacity of the modern sector, low labor productivity in agriculture, and the contractionary effects of structural adjustment on employment.

4. The macroeconomic environment for public works programs is fluid in Africa. The changing capital/labor price ratio, which has been increasing rapidly in the context of structural adjustment policies, lends new and unprecedented support to the argument for more labor-intensive investment in both the public and private sectors.

5. A review of experiences with public works programs outside Africa—in India, Bangladesh, China, and Guatemala—highlights several lessons:

   - The household food security effects of labor-intensive public works programs are a function of the program design. For instance, a short-term project may result in expenditure patterns by the poor which treat project income as "windfall profits." The example from Guatemala hints at that behavior. A longer-term program may have more stable effects on consumption. Sizable food consumption and nutrition benefits were found for the food-for-work (FFW) program in Bangladesh.

   - Policy needs to emphasize good public investment through public works programs and thus creation of productive and sustainable assets. It is important to note, however, that income effects for the poor, derived from public works programs, also have favorable private savings and investments effects, as observed in the Bangladesh and Guatemala experiences. Strengthening financial institutions for the poor alongside public works programs is thus suggested in order to foster these positive effects.

   - Public works programs can be a viable instrument for famine prevention. The Maharashtra case demonstrates this: the employment guarantee feature also triggered "relief works" automatically at local levels. Such a feature enables dealing with crises that otherwise might be too small to trigger public action—an important lesson for dealing with the problem of the small local

famines in Africa. The employment stabilization and insurance effects of a program that includes an employment guarantee, such as in Maharashtra with its self-targeting feature, stands out as a model.

6. In Africa, better understanding of the food security problem, growth in the latent supply and demand for public works programs, and improved macro-incentives in favor of labor intensity have induced many countries to expand public works in the 1980s or to launch new programs. These programs address, either explicitly or implicitly, food security and/or employment problems. Twelve out of the 13 African countries reviewed for this study have substantial experience with public works programs, but half of them, six countries, only moved into this field of activity in the late 1980s.

7. The African experience with public works programs is varied in emphasis: food security focused activities are implemented during emergencies by nongovernmental organizations (NGOs) and international donors in countries, such as Niger and Ethiopia, or implemented by country governments, such as Botswana and Zimbabwe; employment focused projects tend to be of a pilot nature, such as in Burkina Faso and Senegal; and infrastructure focused projects capitalize on employment demand in order to achieve erosion control or road development, such as in Rwanda, Kenya, and Ethiopia.

8. The type of physical output generated by labor-intensive programs varies by country and region. In some countries, for example, Kenya and Nigeria, rural road projects are most common, whereas in other countries, such as Zimbabwe, irrigation and village waterworks hold a large share. In the Sahel countries, resource conservation and afforestation projects rank high. In most countries, the focus is on rural activities, but in Senegal, for instance, current activities have a strong urban bias, with a focus on road improvement, drainage and sewage improvement, and services such as refuse disposal. There have been some very positive experiences with each type of public works program: food security has been enhanced in Ethiopia, large-scale employment has been provided in Botswana, and sound rural infrastructure has been created in Kenya.

9. The target group of such programs (the food insecure poor) has been successfully reached through a variety of mechanisms and design features that include wage rate policy, regional targeting, and

specific selection of households (displaced) and household members (women). Properly designed public works programs have a unique feature in favor of poverty alleviation with low administrative impacts: self-targeting. At properly defined wage rates, the working poor identify themselves by turning up at public works schemes. Thus, in Burkina Faso, only one-third of the minimum wage is paid in some schemes, thereby targeting workers with low opportunity costs. In Tanzania, however, official minimum wage rate policy apparently prevents self-targeting. Also, direct targeting is attempted in some cases: in Zimbabwe, only non-salaried households that fulfill some other "poverty indicators" are eligible for drought-relief public works participation. In Botswana, female-headed households are accorded special consideration in access to employment. In Ethiopia, displaced and asset-poor households are targeted. Research is needed to look into the actual food consumption and nutrition effects of public works programs for improved effectiveness of the (self-) targeting mechanisms.

10. The self-targeting feature of public works programs only operates effectively with an appropriate (low) wage rate policy and a flexible absorption of applicants without rationing workplaces. Wage rate and remuneration policies in public works programs are frequently ad hoc and inconsistent. While in some countries too high official "minimum wages" lead to rationing of workplaces and discrimination against the poor, in other countries a conscious effort is made to open up opportunities for the poor. Improved understanding of labor market features and wage formation is critical to an optimum deployment of public works programs for food security.

11. The issue of payment in cash or (partly) in kind is related to the wider problem of wage rate determination, and to the question of risk of food market failure. African food markets, in rural areas in particular, are poorly integrated and volatile. When increased demand for food is induced through a large public works scheme, food must be forthcoming locally or inflation may result. Inflation also hits nonparticipating households. Food aid can play a role in mitigating such effects if supply is expanded according to the demand induced by public works programs.

12. Women participate to a variable extent in public works programs. In several Sahelian countries with heavy seasonal out-migration of men, the local availability of only women and children is

considered to be a constraint to executing public works programs. On the other hand, women are an explicit target group in Zimbabwe and Botswana. Little is known about the social cost of women's participation in public works programs, that is, the resultant impact on child care and health.

13. A frequently-encountered initial reaction to labor-intensive public works is: "institutional capacities are not sufficient for public works programs." This review suggests that while the lack of adequate institutional capacities is a real constraint, it can be overcome. Furthermore, although public works programs are labor intensive, they are not skill extensive. The general lack of medium-level technical administrative preparedness is a major constraint. Training to overcome these deficiencies is of paramount importance. Zimbabwe is a case in point, where resources for public works programs appeared to exceed implementation capacity in the late 1980s. The Phase II study of this research will examine such issues in more depth.

14. Another common reaction is: "population densities are too low in Africa for labor-intensive works." At a national level, this may appear to be true, but local population densities within countries often reach very high levels. In Botswana, for example, the population is entirely concentrated in the northern and eastern fringes of the country. In Niger, it is concentrated in the southeast. In Ethiopia, parts of the Southern Highlands have densities rivalling any in Asia.

15. The explicit institutional link between food-security-related institutions and public-works-related institutions has remained weak except in a few countries such as Botswana, Zimbabwe, Ethiopia, and Burkina Faso. Food security issues (for example, their regional and seasonal dimensions) do not fully enter policy formulation. Strengthening these institutional links would be an important contribution of donor-supported institution building. There also remains a lack of clarity in the trade-offs between objectives to be pursued by public works; for example, short-term employment creation for food security versus long-term asset creation. This can weaken the effectiveness of public works programs as an instrument.

16. To ensure useful and sustainable asset creation, public works programs need to be integrated into the national planning system for infrastructure and other public goods provision. Yet,

decentralized project identification and implementation is also needed. While some countries (Kenya, Zimbabwe, Botswana, Nigeria) have planned and implemented programs at a regional level, others have set up parallel institutions. Donors need to strengthen mainstream government institutions, rather than set up parallel structures, which remain donor dependent, and face the typical problem of lack of maintenance of created assets and infrastructure after project completion. Community participation in setting priorities needs to be strengthened, otherwise, commitment to maintenance, even of local infrastructures, where positive externalities of programs are captured by others besides those who did the work, is not forthcoming.

17. The rapid evolution of public works institutions, such as the Program of Actions to Mitigate the Social Costs of Adjustment (PAMSCAD) (Ghana); Directorate for Foods, Roads, and Rural Infrastructure (DFRRI) (Nigeria); Agence D'Execution Des Travaux D'Interet Public Contre Le Sous-Emploi (AGETIP) (Senegal); and Agence Nigerienne De Travaux D'Interet Public Pour L'Emploi (NIGETEP) (Niger), in recent years, demonstrates the extent to which past macro-price distortions (labor/capital price ratio) not only led to private sector resource misallocations, but also prevented proper public institutions from emerging to manage (public) works programs with labor intensive technology. Accelerated changes in this respect in the late 1980s suggest that public response is now forthcoming. The risk prevails, however, that learning costs leading to fast institutional build-up will be high. Learning from African and non-African experiences with public works programs can minimize learning costs. The public works program, a development instrument simpler than many other development instruments, is not foolproof, but it can be made very effective.

1. INTRODUCTION

SCOPE OF RESEARCH

Labor-intensive public works programs, a key instrument for addressing food security problems, are widely applied in Asia and were commonly utilized by today's industrialized countries, for example, during economic crises in the eighteenth century and during the 1920s and 1930s. Yet, until recently, they were rarely used in sub-Saharan Africa.[1] This report reviews the experience with labor-intensive public works programs in Africa and identifies potentials for such programs to improve food security of target population groups. The information generated leads to preliminary policy conclusions, strategy formulation, and program design for reducing hunger and malnutrition.

The overall food and nutrition situation in Africa, already showing incipient signs of a widening food gap in the 1960s and 1970s, deteriorated in the first half of the 1980s: per capita food production declined even as consumption continued to grow, and trade and food aid did not make up the difference (von Braun and Paulino 1990). Signs of recovery were visible in the region as a whole in the second half of the decade, largely due to luck (rainfall) and, to some extent, to policy reforms. The country-level picture is mixed: some countries show signs of improvement, whereas others show ongoing or even accelerated deterioration in nutrition. The root causes of food insecurity and malnutrition in large parts of Africa have hardly changed in the past decade and continue to include lack of employment opportunities, constraints on improvement of human capital, constraints on agricultural productivity, and poor health and sanitation environments. In short, the root causes of absolute poverty persist.

Although most of the malnutrition problem is located in <u>rural areas</u>, an emerging feature in the African food insecurity scenario is that of <u>urban</u> hunger and malnutrition, which may be growing in the context of recent adjustment problems and their impact, via economic contraction, on the urban services sector (von Braun et al. 1991). The

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[1] The term "sub-Saharan Africa" is henceforth contracted to "Africa."

phenomenon of urban malnutrition in Africa has so far received inadequate attention.

Most development assistance to Africa has generally been in the form of subsidies for capital goods, services, and transfers to mitigate crises. Subsidies to labor have played a minor role. An important instrument for poverty alleviation that enhances food security has been underutilized, namely, labor-intensive public works programs.

Properly designed public works programs contain several advantages:

- Self-targeting: they reach out to the poor without having to do administrative target group identification—a lower-bound wage rate (food or cash) usually ensures self-targeting;

- Asset-creating: they lay the foundations for future growth of income streams to the poor by upgrading the resource base and improving infrastructure;

- Food consumption-enhancing: as incremental income of food insecure populations is largely spent on food, any incremental employment (income) will expand food demand (Alderman 1986; von Braun and Kennedy 1986);

- Dignity-preserving: they do not carry the stigma attached to charity handouts;

- Strengthening of self-help capacity: this occurs through the created assets and acquired skills; and

- Decentralized planning: appropriately-designed programs rely on the full participation of local populations in project planning and implementation.

In addition to this general argument, there are at least five arguments in favor of labor-intensive programs in Africa.

- African labor markets are generally active, well-integrated, and interregionally connected. Rural-rural migration—not only rural-urban—is, for instance, a common feature in West African labor markets.

- African women participate to a greater extent in farm and off-farm work than do their Asian counterparts (with few regional

exceptions). Given women's key role in food security provision, their socially unconstrained participation in public works programs is certainly a plus.

- In many African settings, community-based labor pooling and labor sharing arrangements are common and such systems may provide a point of departure for (larger) public works schemes with community participation.

- A rapidly growing and very youthful labor force in most African countries.

- A majority of African countries are chronically deficient in precisely those types of productive infrastructure that can lend themselves to labor-intensive development.

The following six questions shall be addressed in this research project:

1. What has been the African experience with labor-intensive public works programs so far?

2. Why have public works programs been limited in Africa; what are the constraints?

3. What lessons can be learned from the Asian and Latin American experiences with public works programs?

4. What are the latent potentials of public works programs for employment generation and food security improvement in various African settings (rural/urban; high/low population density; humid/arid agro-ecological zones; and, different ethnic and sociocultural aspects)?

5. How can these latent potentials be tapped; what are the institutional requirements and costs; and, what is the scope for a participatory approach?

6. How do different types of public works programs compare in terms of efficiency and effectiveness with other instruments for food security improvement; what combination(s) of instruments would be advantageous?

This report mainly addresses the first three questions while the remaining three questions are addressed in Phase II of the ongoing research project.[2]

OVERVIEW OF RESEARCH DESIGN

Labor-intensive works programs, be they food-for-work (FFW), cash-for-food (CFF), or community work schemes, exist in a number of African countries, but knowledge about their impact and scope for expansion is very limited. No comprehensive synthesis, to our knowledge, has been conducted to assess the short- and long-term costs and benefits of these public works programs and their impact on the food insecure population in Africa. Many programs have been somewhat short-lived and, combined with their rapid staff turnover and absence of monitoring information in general, institutional memory has not been built up. Collaboration with host governments is frequently limited. Not surprisingly, no information is available on scale economies of programs of different designs in different settings, which is critical for determining an optimal program size. This lack of information at the program level has resulted in ad hoc experimentation with public works programs by multilateral and bilateral agencies, as well as by nongovernmental organizations (NGOs).

This report attempts to start filling the information gaps. Much of the desired information on economic and food security effects of public works programs is location-, design-, and size-specific, thus part of the ongoing microlevel research on public works. This report begins with a discussion of the theory and policy issues underlying food security and public works programs and defines key concepts and the research approach. Chapter 2 is followed by a review chapter on non-African experiences with public works programs. Chapter 4 assesses Africa's changing economic environment and its implications for public works programs. The final chapter reviews, on a country-by-country basis, the public works experience and potential in 13 countries visited in the preceding few months by IFPRI researchers for the purpose of this research project. The overview at the beginning of that chapter culls general insights from these country reviews while the individual country sections are more detailed and geared towards those readers interested in specific experiences.

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[2] The research project comprises two interrelated tasks. Task 1 is a review of public works experience in Africa. Task 2 is in-depth country studies with program-level research for identification of future potential and impacts of public works for food security improvement of the poor. Task 2, including household surveys, is scheduled for 1991 and 1992.

2. FOOD SECURITY AND LABOR-INTENSIVE PUBLIC WORKS PROGRAMS: THEORY AND POLICY ISSUES

DEFINITION OF CONCEPTS

Labor-intensive public works programs are public programs that provide employment and, typically, generate public goods, such as physical infrastructure, through labor-intensive means.[3] However, the public goods focus is not imperative. On the one hand, while public works programs are publicly supported, they may not necessarily be implemented by the public sector; implementation may rest on private sector and community-level initiatives for choice of program elements, technical design, supervision of implementation, and labor hiring and employment arrangements. Thus, "public works" may often be "private works" in actual execution. On the other hand, certain public works programs, such as construction of village cereal banks or control of erosion on private land, may be publicly sponsored and executed, with a focus on labor creation, but may generate private goods.

Food security means the permanent access to food in sufficient quantity and quality for an active and healthy life. Food insecurity is essentially a problem of households living in absolute poverty. A large proportion of the population of low income countries is food insecure at different degrees of intensity.

Food security policy addresses the level and stability of food availability and aims to reduce the risk of households falling into underconsumption. These risks relate to households' employment, incomes, assets, and production.

Food insecurity and nutritional insecurity are linked in a complex fashion and are rooted in low and unstable incomes and deficient health and sanitation services. Low levels of income are almost synonymous with low levels of labor productivity, which, in turn, relate closely to increased land scarcity, low investment in human capital, absence of

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[3] By infrastructure is meant not just roads and bridges, but also social infrastructure, such as schools and clinics, and even resource conservation, such as afforestation, watershed protection, and terraces, which preserve public goods.

productivity-enhancing technology, and deficiency of productivity-facilitating and employment-expanding infrastructure. The latter factor—infrastructure—has not only strong impacts on the listed causes of poverty, but is also a key link to public works programs for food security.

PUBLIC WORKS PROGRAMS FOR FOOD SECURITY: ONE AMONG SEVERAL INSTRUMENTS

Labor-intensive public works programs offer certain features which make them an attractive complement to a bundle of development instruments for poverty alleviation. An appropriate assessment of the scope for public works to improve food security must place them within the context of a defined development strategy, and of alternative (and possibly complementary) policy instruments (Burki et al. 1976). The scope for such programs is, therefore, to be seen in the multisectoral context of macroeconomic policy, trade and price stabilization policies, and of food and agricultural production policies, as depicted in Figure 1.

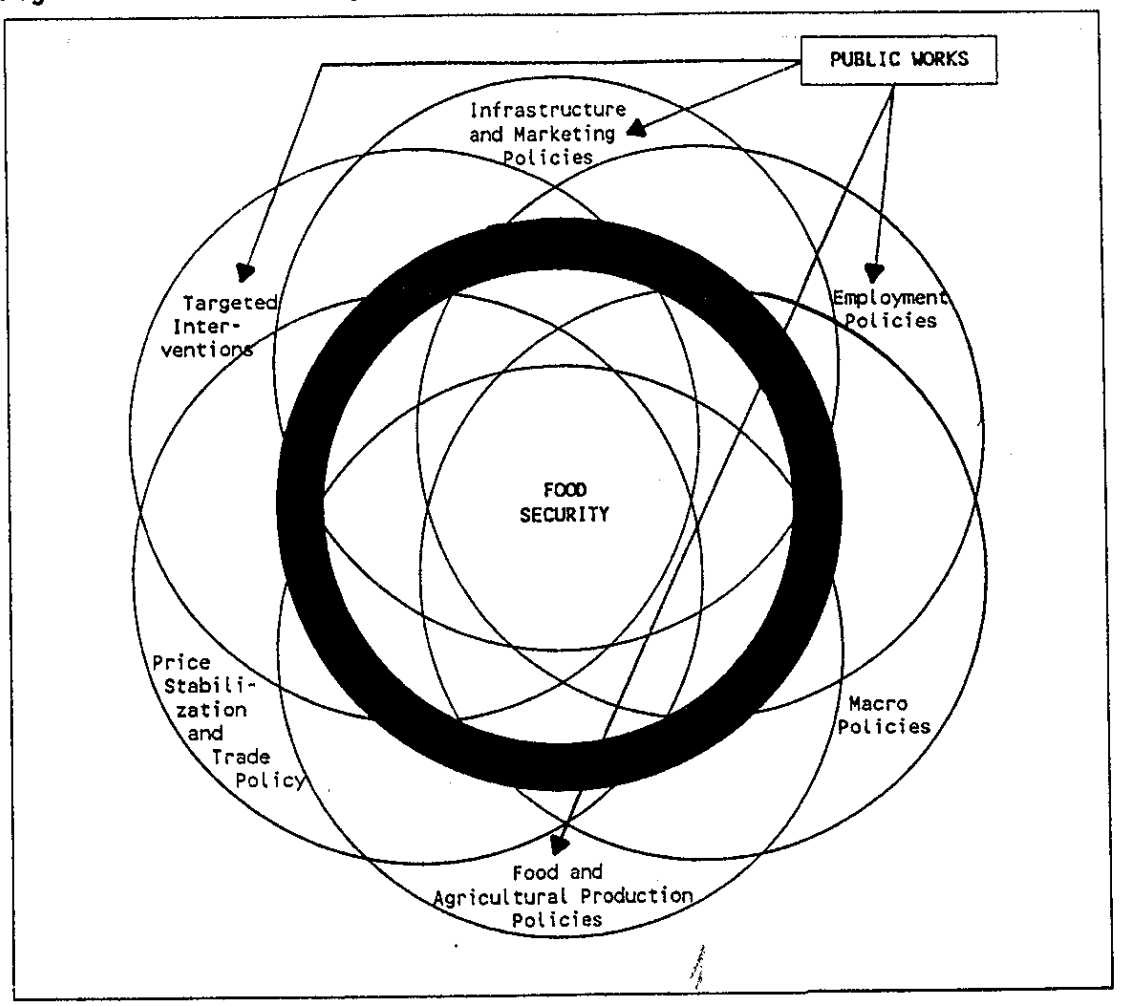
Focus on a single instrument is inefficient; food insecurity has complex causes and inter-temporal manifestations. Theoretically, given an optimal set of complementary policies aimed at food security improvement, the marginal cost per unit of food security improvement of any of the listed policies (Figure 1) should be equal in each policy arena. For example, if complete food security is the goal, its achievement should not come at the expense of encouraging "production policy" in low potential areas as a substitute for social policy, when "targeted interventions" or "employment policies/public works" could achieve the same result at lower marginal cost. Of course, such cost-effectiveness criteria for optimal instrument mixes raise complex issues of sustainability of policies and short-term versus long-term effects.

The Public Works Programs-Food Security Interface

Labor-intensive public works, as well as some alternative poverty alleviation schemes, have both transfer benefits and stabilization benefits, decreasing the risk of consumption shortfalls among the poor (Ravallion 1990). Generating these food security benefits does, of course, require both resources and effective management (Kinsey 1987).

Figure 2 outlines policy and program concerns related to five key areas of the public works programs-food security interface:

Figure 1--Food security and selected overlapping policy areas

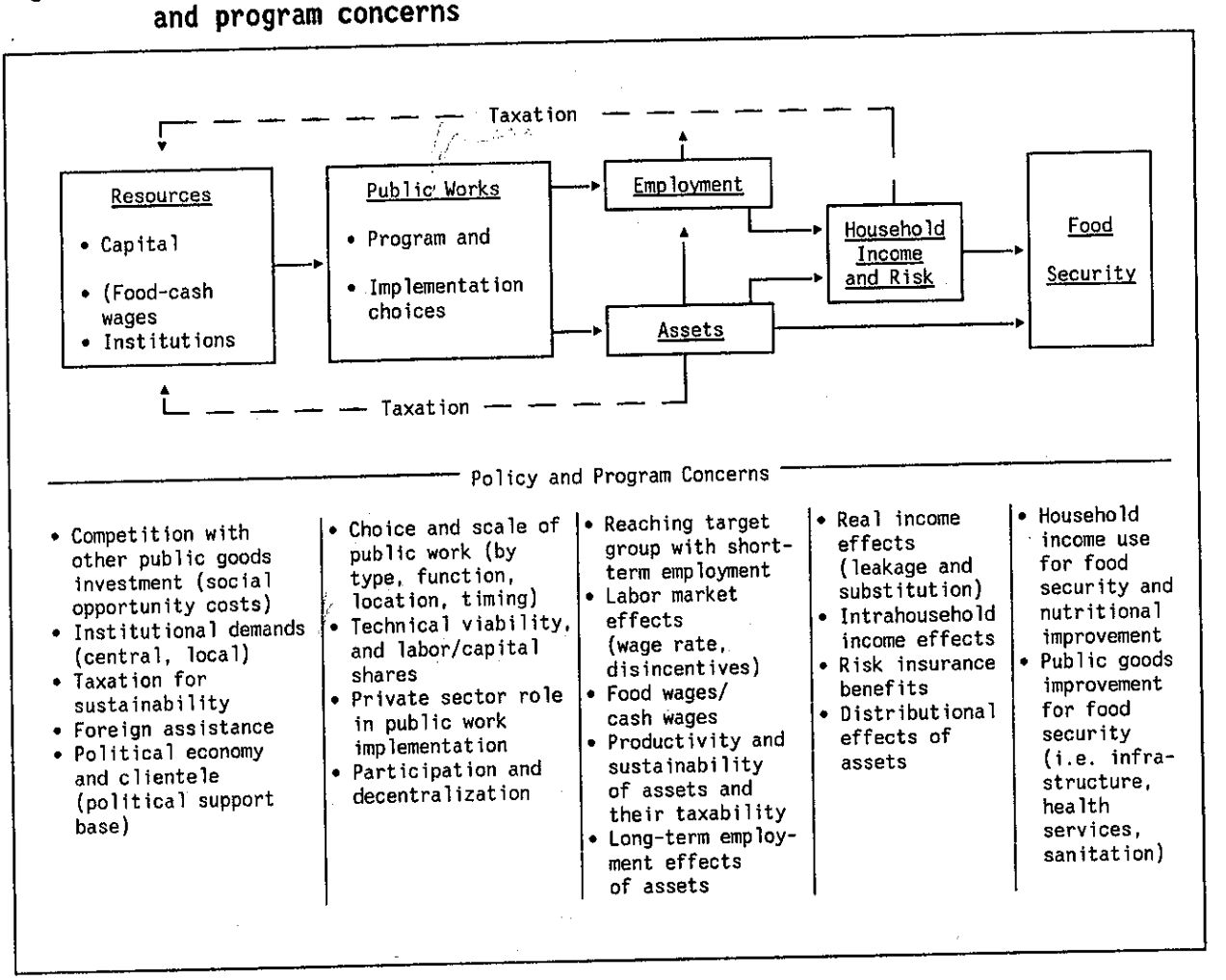


Note: Arrows signal potential inputs of public works into other policy areas relevant for household food security.

- resources for labor-intensive works programs;
- public works programs and implementation choices;
- creation of short-term employment and long-term assets;
- household income and risk reduction; and
- household food security outcome.

Policy and program concerns arising in each of these spheres are listed at the bottom of Figure 2 and discussed below.

Figure 2--Labor-intensive public works for food security: Linkages and policy and program concerns



Resources for Labor-Intensive Public Works. Four types of resources are required for effective public works programs: investment capital (for asset creation); wage payments; institutional capabilities; and, labor. Resources utilized for public works compete with other investments, whether public or private, and therefore need to be valued at their social opportunity costs. An early review of public works programs in developing countries (including a case from Ethiopia, the only African example) found that public works can yield acceptable market rates of return, even when workers are paid fully competitive wages (Burki et al. 1976). Inadequate institutional capability is a problem looming large in many African countries. Foreign assistance can play a key role in addressing this problem (World Bank and World Food Programme 1991). In the long run, public works and their institutions ought to achieve

sustainability when incremental incomes and assets, created through them, become taxable. We shall return to related issues below.

Public works programs, as any other poverty alleviation tool, cannot escape from the necessity of having a political support base. Narrowly targeted subsidy programs for improving food security of the poor—while, theoretically, most desirable on economic efficiency grounds—lack such a support base (Burki et al. 1976; Pinstrup-Andersen 1988). A sustainable political support base can, however, emerge from narrow (self-) targeting of short-term benefits for direct scheme participants, coupled with a wider distribution of benefits from created assets (for example, where those who build the roads are considered as distinct from those who use them).

Related to the political economy issue is a question of attitude: in some African countries, labor-intensive works programs (and FFW programs in particular) are associated with forced labor practices during colonial times, with unfortunate connotations. Bryson, Chuddy and Pines (1990) contend that this association tends to be a problem with politicians rather than with the rural poor.

Program and Implementation Choices. Labor-intensive programs with food security goals attempt to "kill two birds with one stone," that is, to maximize poverty alleviation and thereby achieve food security, jointly with provision of growth and development-oriented public goods. This approach may result in trade-offs. Every country, whatever its stage of development, faces the problem of allocating scarce resources for creation of public goods (goods not provided efficiently or sufficiently by the private sector). The most useful point of entry for public works programs may be in emphasizing an expansion of the labor share in public investment, thereby reducing the capital share wherever this is technically viable and economically justifiable. Theoretically, shadow prices of labor versus capital in the macroeconomic environment ought to determine the choice in the long run. Thus, public works projects need not be viewed as a specific type of "project" but as an element of public sector policy (Burki et al. 1976; ILO 1988a). In actual implementation, however, the choice of public works programs by type (assets), function (short-term income enhancing, risk reducing), timing (seasonality), and location need to be considered.

As stressed earlier, public works programs are not necessarily the state's "public sector works" and can also be "private works" in implementation. In fact, at the worker level, employment in public

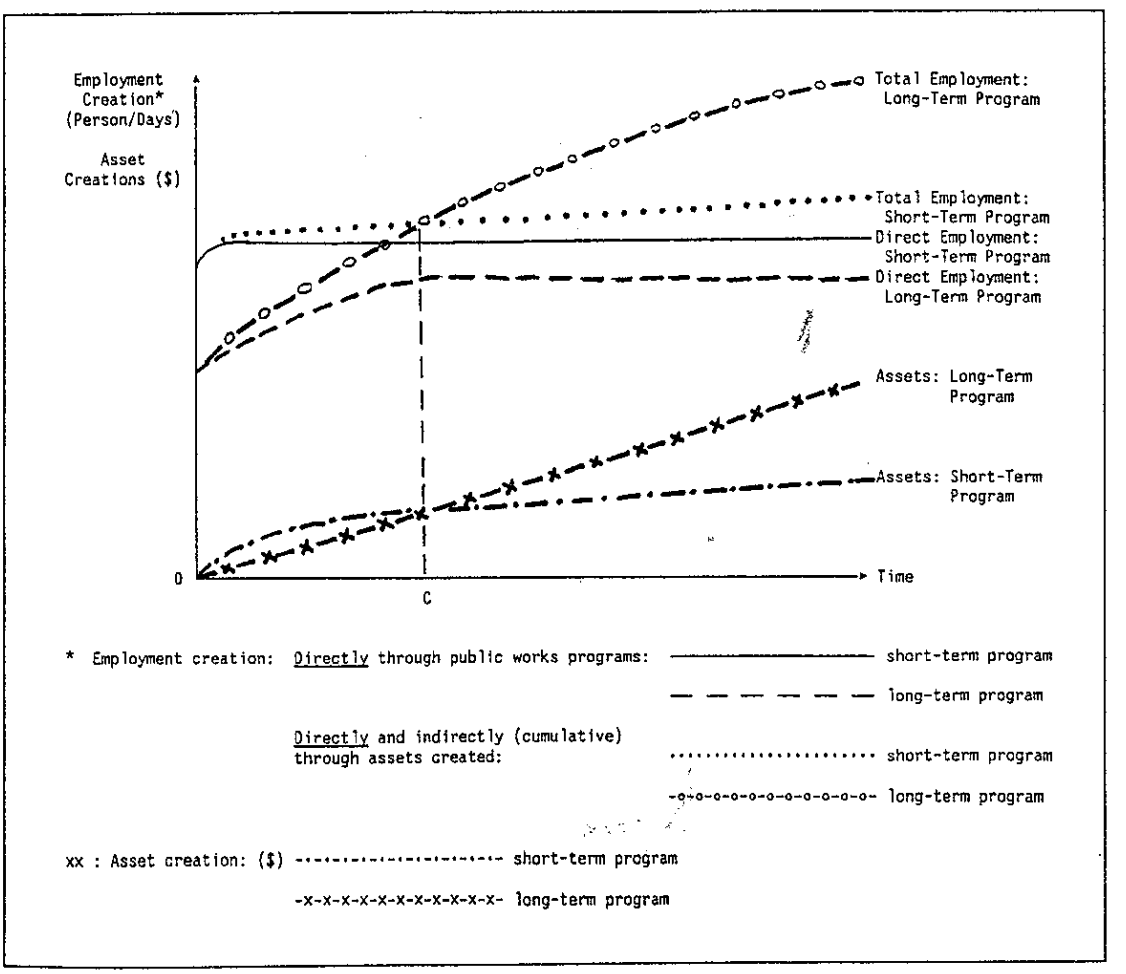
works programs should rarely be considered as public employment, otherwise flexibility in employment arrangements and the (self-) targeting feature of such programs can get lost. Depending on the type and function of specific activities, community participation and decentralization to local government levels in planning and implementation are vital for achieving distributional benefits and longer-term viability. The socioeconomic environment, including initial asset distribution structure, is, however, a critical consideration: frequently, the absolute poor in rural areas lack power, even at the community level. Consequently, simple employment rules, such as guaranteed employment for all at a predetermined wage rate, may facilitate greater participation by the poor than token efforts for their participation in program planning. Local participation is of paramount importance for labor-based development of community-level infrastructure which enhances food security directly and indirectly. As A. Sen puts it,

> the public is not only the beneficiary of [the eradication of hunger], but in an important sense, it also has to be its primary instrument. The first step is to see the public as the active agent rather than merely as the long-suffering patient (A. Sen 1990, p. 34).

A review of the International Labour Organization's (ILO) experience with labor-intensive Special Public Works Programs (SPWPs) in five countries (Burkina Faso, Burundi, Rwanda, Tanzania, and Nepal) found that problems of sustainability frequently resulted from the creation of independent institutional structures external to the governmental system for public works programs (Gaude et al. 1987). Furthermore, technical soundness and productivity of the infrastructure created, together with the perception of immediate benefits by the target group, were found to be crucial for sustainability. Frequently, it was noted that inadequate time was spent in identifying and designing projects. Gaude et al. (1987) therefore suggest a staggered approach: at least one year should be spent at the outset on in-depth design studies for simple institutional structures, on identifying and working with intended beneficiaries, and on carrying out small-scale trials. During a three-year initial phase, SPWPs might concentrate on direct impact for the target group. After this period, an enlarged phase devoted to developing human and organizational resources for sustaining the program at local levels, and institutional and technical resources for sustaining it at the national level, should begin. Included in this phase would be promotion and supervision of public works programs in the context of normal public investment programs (Gaude et al. 1987).

Short-Term Employment and Long-Term Assets. Although short-term employment creation for the poor and long-term generation of income streams (resulting from assets created by public works programs) for both the poor and nonpoor are two distinct outcomes, we deal with them as one area of policy and program concern (Figure 2). This approach stresses the importance of keeping the trade-offs in perspective. Such trade-offs may, however, be more in the short-run than in the long-run. Figure 3 compares, in a schematic way, two public works programs of equal costs, one of which is more focused on immediate employment creation (short-term program) and the other has a more long-term focus. The "long-term" program has a somewhat lower labor share in total cost, due to higher planning and, maybe, capital costs. It makes up for the initially lower employment effects through the employment multipliers of the asset created after some time (at crossover point C in Figure 3).

Figure 3--Trade-off between short-term and long-term employment creation and asset creation with public works programs (schematic)



The issue of employment-asset creation trade-off arises most sharply when public works programs are utilized as time-limited, crisis-mitigating instruments that compete with other instruments, such as free food aid distribution or relief camps. Under such circumstances, a case can be made for program designs to be more immediately employment-focused than asset-focused. Excessive emphasis on short-term employment effects for the target group may, however, result in programs lacking technical and economic viability ("digging holes" programs). On the other hand, disregarding the short-term (self-) targeting feature of public works programs overlooks the key potential for short-term food security improvement with the instrument.

Another trade-off to be kept in perspective is that between coverage and wage rates: wider coverage of the public works employment program at potentially low wages versus narrower coverage [rationed participation] but at benefit levels that enable participants to escape from poverty. As Ravallion (1991) poses the question: "[I]s it better to guarantee employment at potentially low wages for all of the poor, or to guarantee that at least some of the poor are deemed to have adequate incomes?" (1991, p. 60). Ravallion answers the question thus:

> When the budget for poverty alleviation is limited, flexible benefit levels and universal coverage of even a perfectly self-targeting public employment scheme need not be the best policy, in the sense that lower poverty levels may be achieved at the same cost by imposing limitations on coverage at benefit levels sufficient to escape poverty (Ravallion 1991, 75-76).

Direct attacks on food insecurity frequently take the form of food (price) subsidies. Public works programs, on the other hand, are essentially interventions in the labor market; they are a subsidy to labor. While an understanding of food market operations is critical to the assessment and design of food subsidy policies, the same applies to public works programs and the labor market. It is becoming increasingly clear that a simple focus on wages as reliable indicators of labor market conditions is untenable (Radwan 1989). Labor market and wage formation theories tend to be partial. Interlocking transactions, contractual arrangements, and power play their roles. When attempts to redress power imbalances through asset redistribution are "not politically feasible, programs for direct employment creation (such as public works and food-for-work programs) may provide a 'second best' solution for liberating poor households from the grip of 'forced commerce'" (Radwan 1989, 415).

Wage rate determination in labor-intensive public works is—besides the issue of choice of public goods—the most critical policy decision (ILO 1989a). Two considerations come into play here: first, labor market characteristics and labor/capital price ratios, both of which determine choice of technology in public works programs in a specific setting and season of implementation; and second, (reservation) wage rates for the food insecure (including self-employed or subsistence farmers) who participate in the labor market. These two considerations suggest, on the one hand, a concern that wage rates ought not to be too low to reach into the desired skill and productivity levels and so as not to overextend labor intensity (by rationing employment access) and, on the other hand, a concern that wage rates ought not to be too high, precisely to maintain the self-targeting feature of public works programs under fiscal constraints.

It tends to be tempting to set wage rates in public works programs at levels too high (for instance, at public sector minimum wage rates), which then results in employment rationing under prevailing fiscal constraints. In turn, relatively more of the poorest segments of interested employees are then usually excluded. Recent experience with the Maharashtra Employment Guarantee Scheme (EGS) in India provides an example of this phenomenon (Ezekiel and Stuyt 1989; Ravallion, Datt, and Chaudhuri 1990).

Whether wages in labor-intensive public works programs should be in the form of cash or kind (food) depends on local circumstances relating to the risk of market failure. The scale of programs and thinness of food markets are core considerations. Incremental employment and income of the absolute poor translate readily into increased food demand. Market supply must be forthcoming in order to avoid local inflationary food price effects, which would adversely impinge on poor nonparticipating households. Such market supply can, however, be constrained by infrastructure, prices, and/or government policies.

Households have to search for alternative employment and income sources in the absence of public works programs. Three behavioral parameters at the household level are critical for the actual food security outcome (net effects) of public works: a) substitution in employment; b) substitution in income sources, which determines the net effect of income (gross income from public works minus foregone income); and, c) household consumption behavior vis-à-vis public works income versus other earned income.

Private opportunity costs of labor of the poor are rarely zero, because few of the poor subsist on unearned income, such as from renting land or receiving remittances, only. The social opportunity costs may, however, be zero or even negative (for example, when poor people are pushed into environmentally damaging behavior, such as excessive tree cutting and charcoal production). For an appropriate valuation of costs and benefits of public works programs, an assessment of the social opportunity costs of time for the poor is needed. This is relevant under both a short- and a long-term perspective. In the long-term, the productivity and sustainability of assets, their direct and indirect employment effects, and income streams generated from them—including their distribution—are central issues.

It is the asset-creating effect of public works programs that makes the instrument a sustainable, developmental one, beyond being just a form of social security. To the extent that assets created by public works programs result in privately-held assets, it is, of course, legitimate to tax them, such as in the case of irrigation infrastructure. There is little dispute that productive assets created by public works programs are frequently regressively distributed (Clay 1986)—a further argument for linking taxation to them. Sustainability of public goods provision through public works programs has to come through the public sector budget. The more prominent public works programs become in a state or country, the more the attention that needs to be paid to the feedback from assets and income generated by public works programs to resources via taxation (see Figure 2). A simulation analysis in a general equilibrium framework for India supports the superiority of rural public works programs over alternatives for poverty alleviation, particularly when they are financed through taxation rather than reduction in other investments (Parikh and Srinivasan 1989). This highlights the fact that the mode of financing and the opportunity cost of resources used in public works programs must be kept in perspective when (net-) benefits are being assessed.

Household Income and Risk Insurance. Direct welfare effects for poor households resulting from public works programs consist of

1. income enhancement through wage employment in the short run;

2. risk insurance—where public works programs are designed with the desirable feature of employment guarantees; and

3. employment and income effects, directly and indirectly, in the long run from assets created.

Combined, these three effects simultaneously address both transitory and structural food security problems of the poor.

The relative importance of each of the three welfare effects differs by type of households and its food security risk profile. With respect to the distribution of benefits and burdens of incremental employment, it is not only effects at the aggregate household-level that matter, but also who actually participates in the public works program from the household—men, women, or children—that may impinge on intrahousehold resource control and allocation.

Household Food Security Outcome. The actual food security effect of public works programs, then, is determined by the level of household real income effects, both in the short and long run, and household consumption and expenditure behavior. For instance, households' perception of "windfall profit" may induce unusual spending behavior. While increased incomes will have favorable effects on food consumption, the above-mentioned intrahousehold resource control issue may have a further impact on household spending for food and nutritional improvement (that is, male versus female spending preferences in some settings).

Important issues, which also require attention in program design, are women's time allocation to public works programs, child care quality, and, possibly, direct and indirect effects for child labor. When household labor is increasingly allocated to public works programs, other home production chores, for example, wood and water fetching, and caring for small children, may be shifted to older children.

A more general link to food security is via the created assets, especially when these include improved access to health services and sanitation (water). Increasingly, research highlights the strong positive effect of improved health and sanitation on the nutritional status of children (von Braun, Kennedy, and Bouis 1989).

SCREENING THE SCOPE FOR PUBLIC WORKS PROGRAMS

While there are important macroeconomic and institutional issues that determine the scope of and constraints for public works programs, many policy questions for screening the scope of public works programs for food security improvement remain country- and location-specific. A checklist of questions for defining the problems (left-hand side of

Figure 4) can be a useful point for entry for the screening process. A second step is to define the specific scope for public works programs; that is, the problem overlap between food security problems and the deficiency in public goods (right-hand side of Figure 4). A third step is to consider public works programs versus alternative instruments (upper-right block). Finally, institutional and implementation issues must be considered (Figure 4, questions 3 and 4).

ıre 4--Checklist for screening the scope for public works (PW) for food security

Definition of Problem		Definition of Scope for PW: Problem Overlap	
ic Questions	Sub-Questions/Issues		
t is/are. . .?	Is it/are they. . .?	Alternative Instruments: Other Projects	Type of Public Works
...the nature of the food security problem?	-a crisis problem-	-relief;	relief works
	-seasonal problem-	-price and income stabilization	seasonal works
	-chronic income/employment problem	-investment; human capital formation	employment programs
	-much a health/sanitation problem	-health, sanitation services improvement service structures	works for health and sanitation
...the deficiencies in public goods?	-deficiencies in:		
	-directly productive	-irrigation; land improvement, forests, etc.	
	-production enhancing-	-road infrastructure, etc.	
	-social services improving	-schools, clinics, water, sewers, etc.	
...the labor market characteristics?	-seasonality of wages/ operating costs		-PW in season of low operating costs; cash/kind payments
	-structural constraints- (gender)		-PW choice of program
	-volume (thinness)		-PW scale of program
	-skill patterns-		-PW training components
) ...institutional capabilities and political will/ attitudes?	-existing and mobilizable- institutions	-investment in institutional capabilities	
	-potentials for- decentralization	-strengthening local governments	
	-political support base-	-creation and articulation through PW	

3. SELECTED NON-AFRICAN EXPERIENCES WITH PUBLIC WORKS PROGRAMS FOR FOOD SECURITY

Given the large resources committed over the past several decades to labor-intensive public works programs, and FFW projects in particular, partly driven by the concern for improving food security of the poor, it remains surprising how little comprehensive research has been conducted on the food security and nutritional impact assessment of public works-related policies and programs. Clay, in his seminal review of rural public works and FFW projects, concluded that

> too little in the way of resources has been committed to forms of monitoring that would provide the data on which more robust conclusions could be reached...the more rigorous evaluative procedures, the fewer the case studies which can be considered and the more inconclusive the results obtained (Clay 1986, 1247).

In this chapter, we briefly review four selected experiences with public works programs in non-African countries. These countries are Bangladesh, India, China, and Guatemala. The Bangladesh and Guatemala studies carry the analysis through to household food security and nutrition and are based on cross-sectional comparisons rather than on longitudinal analysis, which would be more desirable. Steps towards a longitudinal analysis have recently been taken by executing baseline surveys in public works project areas of the Gesellschaft für Technische Zusammernarbeit (GTZ) in Central America (Kressin 1987, 1989).

BANGLADESH[4]

Bangladesh has a long history of involvement with rural public works programs. Since 1975, the FFW Program has become quite an important component of the rural public works programs. In the mid 1980s, FFW had the capacity to provide more than 100 million days o

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[4] This section is drawn from a comprehensive study undertaken by the International Food Policy Research Institute (IFPRI) and the Bangladesh Institute of Development Studies (BIDS), on the development impact of FFW programs in Bangladesh (IFPRI/BIDS 1989).

employment or about 17 days of additional employment per landless worker. FFW was primarily involved in creating land infrastructures such as irrigation, flood control, and embankments. FFW has had positive impacts on a range of development variables.

The developmental impact of the program, that is, the impact on rural income, agricultural production, employment, household investment, and nutrition was quite impressive. The IFPRI/BIDS (1989) study analyzed five types of FFW projects in nine project villages and seven control villages, and found that dietary intakes improved for all age groups examined in the project sites relative to the control sites. There may, in general, have been an equalizing trend in the project sites for nutritional differences between boys and girls at various ages. Girls were significantly worse off in the younger age groups. Short-run gains in cereal consumption for small landholder groups appear to be greater than longer-run improvements. Slightly higher cereal consumption was also observed among landless and near-landless project participants in comparison to similar nonparticipants in project villages.

Agricultural production increased by an average of 27 percent and per capita household income by about 10 percent, as a result of direct and indirect effects of the project. More productive employment generated substituted for very low productivity employment among rural households. Wage employment increased by about 13 percent while self-employment declined by about 10 percent. An important aspect of this shift in employment was the distribution towards reduced seasonal fluctuations, especially for the landless and near-landless, by creation of more employment in the traditional slack period.

In addition to direct creation of community-level assets, FFW projects have a significant effect on capital formation at the household level. Increased capital formation enables households to deal with seasonal and year-to-year fluctuations in income flows and, thereby, stabilize consumption at higher levels, while reducing dependency on moneylenders.

Quality of management, as reflected in design and implementation of projects, is vital for generating positive effects of FFW programs. Local government has to perform critical functions such as selection, design, and implementation of projects that meet local needs; routine maintenance of structures created by public resources; and generation of local resources for maintenance as well as new asset creation in rural areas. Maintenance of roads, canals, embankments, and other physical

facilities is generally neglected because of the absence of effective local organizations endowed with the required resources. For rural infrastructure to continue to be useful, maintenance of these public assets is a priority.

The study came to the conclusion that

> food-for-work projects, if properly selected, designed, and implemented, generate a very substantial productive impact on village economies. Therefore, the program should not be considered only as a vehicle for short-run relief to the distressed and underemployed sectors of the rural population, but as a means for construction of productive long-term rural infrastructures (IFPRI/BIDS 1989).

The key role of improved infrastructure for rural growth, development, and household food security was highlighted by the study. Further research into the linkages between infrastructure and consumption lends additional support to this finding (Ahmed and Hossain 1990).

THE MAHARASHTRA EMPLOYMENT GUARANTEE SCHEME (EGS), INDIA[5]

The EGS is a particularly interesting example of a public works program for food security because of its explicit design to guarantee employment at a defined wage. It is, thus, an "employment first" program. Specifically, the scheme provides an unlimited guarantee of employment to all adults above 18 years of age in rural Maharashtra, who are willing and able to work at the given wage in construction activity. There are no other eligibility requirements. The projects are generally within five miles of villages.

The overall goals of the EGS are to sustain household welfare in the short run (through provision of employment) and, simultaneously, to contribute to the development of the rural economy in the long run, through strengthening rural infrastructure. The EGS has been operating for 15 years. As an indicator of the scale of its operations, in 1986-87, for instance, it generated an equivalent of 625,000 person-years of employment.

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[5] This section draws upon Ezekiel and Stuyt (1989).

The EGS, as it exists now, is self-targeting in nature. There is no means test. It is assumed that those who offer themselves for employment at any given time are those who are in need of such employment at that time. These needs depend on circumstances which vary from area to area, season to season, year to year, and even family to family. The automaticity and open-ended commitment to provide employment to all those who offer themselves for employment are thus central to the EGS. These features cannot easily be replaced by a bureaucratic decision-making process.

An important aspect of the EGS is its seasonal stabilization effects. Analysis by Ezekiel and Stuyt (1989) shows that program-provided employment volume is roughly a mirror image of agricultural employment: when agricultural employment is up, EGS employment is down and vice versa. Whereas a response to regular seasonal fluctuations with public works programs appears a plausible task, crisis situations pose a larger challenge. The existing administrative apparatus of the scheme is flexible enough to expand and contract in different districts in accordance with changes in all types of needs, including those resulting from crises that, in the absence of the scheme, might have resulted in famine. Between 1972-87, Maharashtra State, as a whole, suffered from a serious crisis only in one year, 1979-80, although different districts suffered from local crises, for instance, due to local drought, at different times. The EGS responded automatically to crisis situations in affected districts, even when the overall situation in the state was above average. Ezekiel and Stuyt (1989) thus stress that the scheme absorbs also the cost of famine relief and prevention in Maharashtra.

The set of potential participants in the rural public works scheme may be far larger than that of actual participants at any one date (Ravallion 1990). Many who rarely participate will still value the scheme's insurance benefits related to employment guarantees. This distribution of insurance benefits, along with the wide distribution of assets created versus the more narrow distribution of direct employment and wage benefits of participants, is critical for the political support of such a program.

The EGS is not free of problems (Ezekiel and Stuyt 1989; Ravallion 1990). Basic problems relate to wage rate determination, selection and implementation of suitable small infrastructure projects, poor construction and work performance, and undercapitalization of the works programs. However, evidence from selected surveys in Maharashtra suggest that the EGS has performed well in reaching the poorest (see

references in Ravallion 1990), not only directly through actual scheme participants but also indirectly through the effects on regional wage rates and on expenditure linkages.

The EGS experienced a major policy change in May 1988: average real wage rates paid in the scheme increased about one-third. As a result, the scheme apparently lost some of its self-targeting nature, due to fiscal constraints (Ravallion, Datt, and Chaudhuri 1990). Based on an analysis of related consequences for participation and distribution, Ravallion, Datt, and Chaudhuri (1990) concluded that achieving maximum targeting of the poorest first with limited budgetary resources must entail a sufficiently low wage rate.

CHINA[6]

Labor-intensive works programs are an important tool for development with poverty alleviation in China. Public works programs existed in ancient times with the purpose of distributing aid to disaster victims. In the mid-1980s, public works schemes were redesigned in response to striking regional differences and concentration of poverty, so as to specifically aid poor areas and target the poor directly for employment creation and infrastructure development.

About 4 billion yuan are spent annually by the central government for "aiding the poor and poor areas" projects. Besides financial support, the central government also contributes surplus goods as payment-in-kind. The decision to reallocate these goods was made in 1984, when China had a series of good harvests and the State was running out of storehouses. Between 1985-87, 2.7 billion yuan worth of surplus grain, cotton, and cloth were contributed for public works programs such as road construction and provision of drinking water in poor areas Much of the surplus goods was not used for payments-in-kind to laborer but was monetized at the provincial level. A specific coupon syste linked to the banking system was designed for the purpose of appropriat follow-up on the monetization of the commodities. A further three-ye: plan, scheduled for implementation in 1991, has been designed for publ works programs in poor areas and is expected to involve 1.5 billion yu of surplus goods.

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[6] This section is based on Ling and Zhong-yi (1990).

Except for Beijing, Shanghai, Tianjin, and Jiangsu (advanced provinces), all provinces were included in the central resource allocation planning for the public works scheme. Generally, the less-developed provinces, with a higher proportion and absolute number of the poor, obtained a larger share of the allocation. Road construction and drinking water supply programs are key projects. In general, provincial governments disperse investment between the two projects in the ratio 8:2 or 7:3.

Completed public works during 1985-87 (the largest share financed with surplus goods) include 120,000 kilometers of roads of which 46,000 kilometers were new State class motor roads, 7,200 bridges, 172,600 hectares increment to irrigated area, 240,000 hectares of land protected from waterlogging, 1.13 million hectares of land protected from soil erosion, 1.56 million kilowatts of increased capacity of generators at small hydropower stations, and an increase in drinking water supplies for 14.5 million people and 9.7 million domestic animals.

Labor-intensive public works schemes have created employment opportunities and raised incomes of the rural labor force, particularly since intensive labor input is a characteristic of these projects. Labor input in the works is mainly through the "obligatory labor input system," in which each laborer is required to contribute a number of workdays to the public works (for which he may receive subsidies or remuneration). Those households which do not fulfill their obligations have to pay money. As an indicator of the scale of this system, for instance, in Guizhou Province between 1985-87, obligatory labor input amounted to 60 million workdays, with laborers averaging about 3-5 workdays per person per annum. Wages varied among counties and townships from 0.5-1.8 yuan per workday and were lower than wages paid for similar labor by the formal State capital construction projects.

Studies for Guizhou Province suggest that road construction public works programs have improved infrastructure in poor regions; contributed to investments in human resources through transmission of skills; promoted sectoral and spatial labor migration; encouraged favorable conditions for social development and economic growth; increased income of village residents that, in turn, increased revenues of local governments, enabling improvements in social, health, educational, and cultural services; and facilitated commercialization of poor areas by permitting increased and cheaper transportation of goods. For instance, in Guizhou Province, 1,331 township enterprises were established along 2,150 kilometers of roads in the year following road construction under

the public works program and newly created nonagricultural employment numbered an estimated 133,000.

The drinking water supply through public works programs has markedly improved basic living conditions of the poor and has especially reduced water-borne diseases, as suggested by reports from Sechuan Province. Cost of water delivery has also been cut greatly.

Although only the tip of the iceberg has been scratched with respect to the Chinese experience with public works programs, and comprehensive cost-benefit analyses are lacking, tentative indications are that the public works policy is feasible and probably effective. Factors contributing to successful outcomes include a clear objective to aid the poor areas and target the poor to benefit directly from employment and service infrastructure; selection of projects and technologies suited to the resources of the poor areas; the system of local participation; and effective organization. We know of no comprehensive analysis of household-level food security effects of the large public works programs in China.

GUATEMALA

Most public works programs today focus on rural areas and rightly so, because of the concentration of absolute poverty among the rural population. However, the nature and speed of urbanization and the contractionary effects of economic adjustment, especially on the urban labor market, invite increased concern for food security of the urban poor. In addition, the Latin American urban food security situation calls for particular attention, given the relative distribution of urban versus rural households.

A recent study by Bell, Hay, and Martinez (1989) on the effects of FFW programs in an urban environment, Guatemala City, sheds some light on this under-researched issue. The study, based on a small sample, focused on what families did with the extra income they received from commodity wages when participating in public works on community projects.

A nongovernmental organization, CARE, assisted the municipality in selecting, organizing, supplying, and supervising suitable project types. Project materials were made available and food provided through food aid. Transport costs were met through monetized food aid. Work on the project was remunerated according to set productivity norms and was

geared to provide a food ratio which equals the value of the daily wage for urban unskilled labor in return for a full six hours per day work. Works carried out under the project included the construction of drainage and sewage systems, walkways, retaining walls, rubbish dumps, and street paving. The related gains, social amenities, and community utilities were not the subject of the study.

Almost all families (98 percent) increased their consumption as a result of food aid and 65 percent increased their food consumption. The study found an almost complete independence between expenditure from food aid income and expenditure from income from other sources, and speculated that households regarded the food aid income as temporary or windfall income and therefore spent it differently than if it was a permanent addition to their incomes.

Unlike the Bangladesh study, the data from this sample did not support the hypothesis that households generally save and invest from incremental income such as provided by food aid wages. However, when the sample was divided into "savers" and "consumers," a significant relationship between the value of food aid wages received and the amount saved was observed. On average, for each dollar value of food aid received, 24 cents was saved. Investment was mainly in small-scale household enterprises. This finding is consistent with the Bangladesh study summarized above.

Some general lessons from this set of cases of public works program experience are highlighted here:

1. The household food security effects of labor-intensive public works may be much a function of the program design. For instance, a short-lived project (or one perceived as such by participants) may result in food and nonfood expenditure patterns by the poor which treat the direct public works income as "windfall profits." The Guatemala example hints at that. A more long-term program may have greater stable effects for consumption and savings/investment behavior. Sizable food consumption and nutrition benefits were found for the FFW project in Bangladesh. The basis for generalization across countries, however, is thin.

2. Whereas policy needs to emphasize good public investment through public works programs and thus the creation of productive and sustainable assets, it is important to note that income effects for the poor, derived from public works

programs, also have favorable private savings and investments effects. This was highlighted by both the Bangladesh and Guatemala experiences. Strengthening financial institutions alongside public works programs is thus desired.

3. Public works programs for famine prevention can be a viable instrument as exercised in the EGS, where the employment guarantee feature also triggered "relief works" automatically at local level. This deals with crises that otherwise might be too small to trigger public action—an important lesson for dealing with the permanent problem of the small local famines in Africa. The employment stabilization and insurance effects of a program which includes an "employment guarantee," such as the EGS, with its self-targeting feature, stands out as a model.

4. Comprehensive studies, which include household-level food security effects of public works programs, are also lacking outside Africa. The size of public works operations versus the level of knowledge about program costs, benefits, and food security effects is in an unsatisfying relationship, such as in China.

4. AFRICA'S CHANGING ECONOMIC ENVIRONMENT FOR LABOR-INTENSIVE PUBLIC WORKS

It is widely understood that the macroeconomic environment and direction of economic strategies are central to development program success or failure. Past project failures in Africa, resulting from planning in a macroeconomic vacuum, have taught this lesson at a high cost (Lele 1989). Consideration of an increased role of public works programs for food security improvement, therefore, needs to take due account of the current economic environment and of future trends, both of which determine the latent potential of public works programs. While skeptical about public works programs in Africa, Clay (1986, 1248) concludes that "the trauma of the recent (African) crisis is likely to alter policies, to produce reassessment and reorganization of many projects and to create many new ones and may necessitate another reevaluation." This research is driven by a similar perspective, in view of the drastically changed macroeconomic and policy environment in Africa. Program and project-level issues, conceptualized in the previous chapter, must focus on the question: How can latent potentials be transformed into actual potentials?

Four broad trends currently influence the environment for labor-intensive public works programs in Africa—three work in favor and one in disfavor of such programs.

1. Macroeconomic incentives: increases in capital/labor price ratios are inducing investments to be more labor intensive. In order not to limit this price incentive in favor of labor to private investment, policy reforms for increased market orientation are needed to transmit this to public investment.

2. Food insecurity: this is becoming increasingly a problem of labor-market-dependent people in rural and urban areas, which argues in favor of employment-focused interventions rather than non-sustainable food subsidy systems, for reaching out to them. Governments are also recognizing more and more that employment expansion is crucial for poverty alleviating growth and development. An inability of the private sector across

Africa to absorb labor supply growth has forced the public sector to assume a major role in this respect.

3. Rapidly deteriorating infrastructure: fiscal and foreign exchange constraints inhibit maintenance and new construction of basic infrastructure by capital-intensive technology. Yet, provision of these public goods is indispensable for revitalized growth in Africa. Market integration and technological change in agriculture and small industries, engines of such growth, depend upon infrastructure. Conservation, restoration, and enhancement of the natural resource base, a labor-intensive set of activities, are also recognized as priorities for public investment of high labor content.

In sum, the macro-price environment is shifting in favor of labor-intensive public works programs; changing food insecurity characteristics and a labor supply explosion are making public works programs increasingly attractive; and the limited and rapidly deteriorating infrastructure situation is calling for such programs. A constraint to the adoption of public works programs, however, frequently arises in the form of institutional capacities.

4. Institutional capacities: such capacities to design, supervise, and execute sound public investment programs, limited in the first place, have been generally eroded in the context of fiscal constraints and progressive dismantling of public institutions. Only in a few African countries do capacities for program planning exist at the local government level where it is most desirable for a decentralized organization of public works programs. New institutions for public works programs have been set up recently in a number of countries because of the changed economic environment, but are not yet fully in place or do not possess the institutional capacities to adequately perform their work.

In this chapter, the first three issues (in favor of public works programs) are discussed more intensively, with examples drawn from 18 African countries.[7] More in-depth individual country experiences, in

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[7] The 13 study countries plus Mali, Mauritania, Ghana, Angola, and Malawi.

which the fourth issue—institutions and management—is reviewed, are related in Chapter 5.

MACRO-INCENTIVES IN FAVOR OF LABOR INTENSITY

Population growth is expected to remain at high levels in all African countries. In fact, in 9 of the 18 countries reviewed here, growth rates are expected to increase during the 1990s (Table 1), beyond their already high levels. Urbanization, in general, and the concentration of urban population in a few cities, in particular, is on the upswing in virtually all 18 countries (Table 1). Naturally, this population growth will be translated into labor supply growth with its

Table 1--Selected population statistics for 18 African countries, 1965-2000

Country	Population Mid-1988	Population Growth Rate			Urban Population as Share of Total Population		Urban Population in Cities of 500,000+	
		1965-80	1980-88	1988-2000	1965	1988	1960	1980
	(millions)	(percent)			(percent)		(percent)	
West Africa								
Nigeria	110.1	2.5	3.3	3.1	17	34	22	58
Niger	7.3	2.6	3.5	3.3	7	18	0	0
Burkina Faso	8.5	2.1	2.6	2.9	5	9	0	0
Senegal	7.0	2.9	3.0	3.2	33	38	0	65
Cameroon	11.2	2.7	3.2	3.2	16	47	0	21
Mali	8.0	2.1	2.4	3.0	13	19	0	0
Mauritania	1.9	2.3	2.6	2.7	10	40	0	0
Ghana	14.0	2.2	3.4	3.0	26	33	0	48
East Africa								
Ethiopia	47.4	2.7	2.9	3.3	8	13	0	37
Kenya	22.4	3.6	3.8	3.4	9	22	0	57
Sudan	23.8	2.8	3.1	2.7	13	21	0	31
Tanzania	24.7	3.3	3.5	3.4	5	30	0	50
Southern Africa								
Botswana	1.2	3.5	3.4	2.6	4	22	na	na
Rwanda	6.7	3.3	3.3	3.8	3	7	0	0
Zimbabwe	9.3	3.1	3.7	2.7	14	27	0	50
Mozambique	14.9	2.5	2.7	3.1	5	24	0	83
Angola	9.4	2.8	2.5	3.0	13	27	0	64
Malawi	8.0	2.9	3.4	3.5	5	14	0	0

Source: World Bank, World Development Report (New York: Oxford University Press, 1990), Tables 1, 26, 31.

na = not available.

consequent implications for economic growth and development (Ghose 1990). As a result of present age structures (a preponderance of youths under 15 years of age), the labor supply may actually grow faster than the total population. While estimates of activity rates differ substantially by country (Table 2), in the context of ongoing and future structural change and urbanization, they are likely to continue rising in most countries.

The "cost of labor" fell during the 1980s in Africa. A subsample of five countries shows that wage rates of unskilled agricultural labor, in U.S. dollar terms, dropped in the 1980s (Table 3). This drop is most striking in two West African cases, Nigeria and Ghana, compared with the East and Southern African cases (Figure 5). The decline in the real price of labor (wages) was by no means gradual: in some countries (Zimbabwe, Botswana, and Ghana), it was accompanied by large fluctuations, whereas in Kenya and Nigeria, there was a more steady erosion of wage rates (Figure 6). Wage rates (in deflated domestic currencies) recovered in the late 1980s in Ghana and Kenya (Table 3).

Table 2--Selected employment statistics for African countries

Country	Year of Survey	Economically Active Population Mid-1988[a]	Activity Rate		
			Total	Male	Female
		(millions)		(percent)	
West Africa					
Nigeria	1983	35.23	32.0	43.1	20.6
Burkina Faso	1985	4.34	51.0	53.9	48.2
Senegal	1985	3.29	47.1	55.3	39.1
Cameroon	1985	4.31	38.5	47.4	29.6
Ghana	1984	6.36	45.4	44.9	45.8
East Africa					
Ethiopia	1984	20.81	43.9	53.5	34.3
Tanzania	1978	11.07	44.8	44.4	45.2
Southern Africa					
Botswana	1984-85	0.44	37.0	38.1	36.0
Rwanda	1978	3.69	55.1	54.6	55.6
Zimbabwe	1982	3.08	33.1	n.a	n.a
Malawi	1983	4.17	52.1	52.4	51.7

Source: International Labour Organization, Yearbook of Labor Statistics (Geneva: International Labour Organization, various years).

[a] Update to 1988 is based upon applying the activity rates to the mid-1988 population levels.

3--Agricultural wages/earnings in selected African countries, 1978-88

Indicator (Unit)	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
l agriculture wages/day											
ra)	1.8	3.3	3.3	4.7	4.7	4.7	5.0	5.0	7.0	8.5	10.2
er price index	81.4	91.0	100.0	120.8	130.1	160.4	223.8	236.2	248.9	274.2	379.1
ed wages (Naira)	2.2	3.6	3.3	3.9	3.6	2.9	2.2	2.1	2.8	3.1	2.7
l earnings/month (Dec.)											
is)	172	186	329	503	559	886	2,298	2,753	5,740	7,835	10,526
er price index	43	67	100	217	265	590	824	909	1,132	1,583	2,080
ed earnings (Cedis)	400.0	277.6	329.0	231.8	210.9	150.2	278.9	302.9	507.1	494.9	506.1
l total earnings/month											
s)	376.9	411.5	434.5	483.0	502.2	539.1	585.0	633.7	720.5	794.3	914.6
l male earnings/month											
s)	413.3	442.4	463.7	505.0	535.3	549.2	614.2	660.0	762.0	864.4	995.4
l female earnings/month											
s)	232.5	269.8	313.1	388.5	366.2	483.6	436.4	498.6	551.1	553.0	636.8
er price index	83.6	89.6	100.0	113.8	143.3	165.1	197.6	199.8	215.2	233.1	236.6
ed total earnings (KShs)	450.8	459.3	434.5	424.4	350.5	326.5	296.1	317.2	334.8	340.8	386.6
ed male earnings (KShs)	494.4	493.8	463.7	443.8	373.6	332.6	310.8	330.3	354.1	253.7	257.5
ed female earnings (KShs)	278.1	301.1	313.1	341.4	255.5	292.9	220.9	249.5	256.1	218.0	247.3
l cash earnings/month											
a)			48.1	56.8	45.3	74.9	66.1	64.4	87.5	92.6	98.6
er price index	78.7	87.8	100.0	116.3	111.2	122.9	133.3	144.1	158.6	174.1	188.6
ed earnings (Pula)			48.1	48.9	40.8	61.0	49.6	44.7	55.2	53.2	52.3
l earnings/month (Zdollars)	29.2	34.2	38.3	62.0	77.0	88.00	98.1	66.7	73.8	85.2	95.7
er price index	83.4	94.9	100.0	113.1	125.2	154.1	185.2	200.9	229.7	257.9	277.4
ed earnings (Zdollars)	35.0	36.0	38.3	54.8	61.5	57.1	53.0	33.2	32.1	33.0	34.5

d Sources:

The 1978-87 nominal agricultural wages are obtained from Lele et al., Nigeria's Economic Development, Agriculture's Role, and World Bank Assistance, 1961-88: Lessons for the Future, MADIA Discussion Paper 1 (Washington, D.C.: World Bank, 1989). The 1988 nominal agricultural wage is calculated by assuming that the rate of change of wages equated the GDP per capita growth in the 1987-88 period.

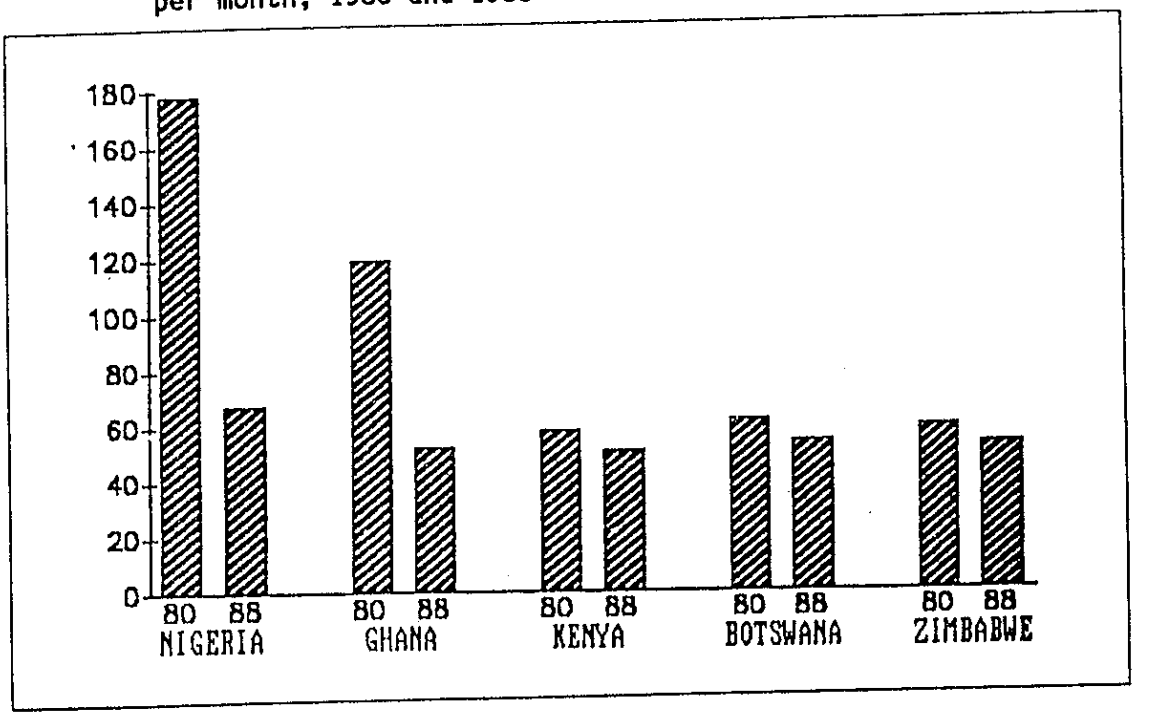
The 1978-1984 nominal earnings data are obtained from International Labour Organization, Yearbook of Labor Statistics (Geneva: International Labour Organization, various years). Nominal earnings for 1985 and 1986 are from Ghana, Statistical Service, Quarterly Digest of Statistics (Accra: Statistical Service, September 1989). The 1987 provisional earnings are from the June 1989 issue. The percentage change between the provisional 1986 and 1987 earnings presented there is applied to the 1986 nominal earnings here. The change between 1987-88 is assumed to be the same as the GDP/capita change.

The 1979-87 nominal earnings data are from International Labour Organization, Yearbook of Labor Statistics (Geneva: International Labour Organization, various years). Average wage earnings per employee are presented in the Central Bureau of Statistics, Economic Survey 1990 (Nairobi: Ministry of Planning and National Development, 1990). The 1986 and 1987 figures correspond closely to the ILO figures. Therefore, the change in earnings between 1987-88 in the Economic Survey is applied to the 1987 ILO figure to obtain the 1988 earnings.

: The employee estimated monthly cash earnings series for 1980-88 is from Central Statistics Office, Labor Statistics 1988 (Gaborone: Government of Botswana, 1988). The data for 1980-84 is for the month of August, whereas that of 1985-88 is for September.

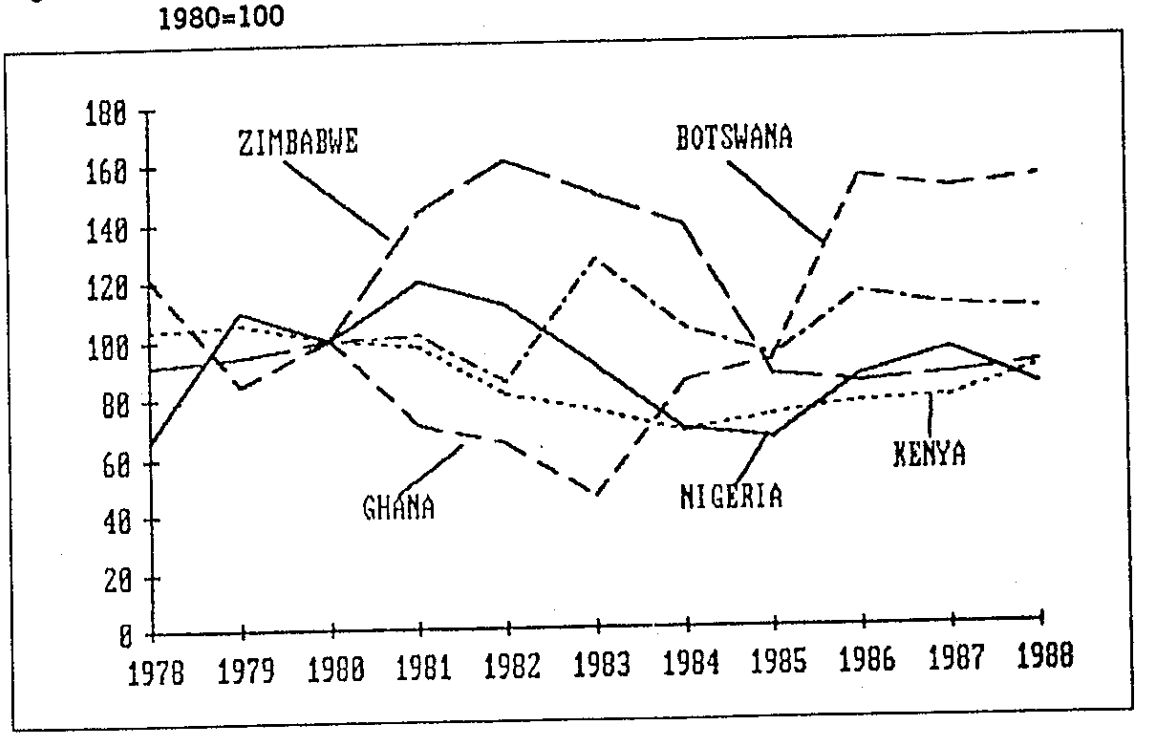
: The 1978-84 nominal earnings data are from International Labour Organization, Yearbook of Labor Statistics (Geneva: International Labour Organization, various years). The 1985-88 data is obtained from the Central Statistics Office, Quarterly Digest of Statistics (Harare: Central Statistical Office, 1989) (by dividing total earnings by number of employees and by 12 months). It was observed that the 1978-84 data presented in the QDS corresponded very closely to the ILO data.

Figure 5--Monthly wages/earnings in agriculture, current U.S. dollars per month, 1980 and 1988



Source: See notes to Table 3.

Figure 6--Index of real deflated wages/earnings in agriculture, 1980=100



Source: See notes to Table 3.

Devaluation of (overvalued) domestic currencies is a central feature of structural adjustment and was pursued rigorously in the 1980s, for example, in Nigeria and Ghana (Table 4). The extent to which devaluation, which means decreasing the price of non-tradeables vis-á-vis traded goods, affects real wages in the short and long run depends on the labor content of the traded and non-traded sectors (services). Loser-gainer patterns are complex. In the short to medium run, wage rate effects for unskilled labor tend to be negative, because of a sluggish supply response to price incentives in the traded goods sector. In five selected African countries, it was observed that the time of labor purchased per U.S. dollar increased substantially.

Declining wages and reduced employment are frequently features of structural adjustment. These elements of contraction within adjustment argue for employment-expanding measures parallel to adjustment measures, both for limiting the 'social costs of adjustment,' and for fast and effective utilization of labor resources in building the foundations of economic growth (Mkandawire 1989).

Even as a reduction in the "cost of labor" presents an incentive for public works programs in Africa, a parallel increase in the "cost of capital" gives further impetus to labor-intensive investment. Defining this increase in the cost of capital, however, is not straightforward. Change in the actual terms of external borrowing would be a misleading indicator; compared to the early 1980s, average interest rates are down (Table 5). Yet, external borrowing is dominated by rationed credit from

Table 4--Exchange rates and change in labor time purchased per U.S. dollar, 1980-88

Country	Exchange Rate			Change in Labor Time Purchased Per U.S. Dollar[a] 1980-88
	Unit	1980	1988	
				(percent)
Nigeria	Naira/$	0.547	4.482	+158
Ghana	Cedi/$	2.750	200.000	+119
Kenya	Shs/$	7.420	17.747	+ 14
Botswana	Pula/$	0.777	1.816	+ 15
Zimbabwe	Zdollars/$	0.643	1.802	+ 12

Source: International Monetary Fund, International Financial Statistics Yearbook (Washington, D.C.: International Monetary Fund, 1990).

[a] The agricultural wage rate is used for this calculation. U.S. dollar inflation is disregarded.

Table 5--Average interest rates for external public borrowing for selected African countries, 1980-88

Country	1980	1988
	(percent)	
Nigeria	10.6	7.6
Ghana	1.6	1.0
Kenya	3.5	1.9
Botswana	6.0	2.4
Zimbabwe	7.1	7.1

Sources: The 1980 interest rates are from World Bank, Sub-Saharan Africa: From Crisis to Sustainable Growth (A Long-Term Perspective Study) (Washington, D.C.: World Bank, 1989). The 1988 interest rates are from World Bank, World Development Report (New York: Oxford University Press, 1990).

Note: The average interest rate is weighted by loan amounts.

official channels (for example, International Development Association (IDA)), and does not, therefore, reflect true cost of borrowing at the margin. For some African countries, international financial markets have the character of "missing markets." Drastic increases in the cost of capital from external sources are partly reflected in exchange rate changes (for example, the amount of Naira required per U.S. dollar borrowed) and partly in net inflows of public and publicly guaranteed loans. Compared to the early 1980s, such net inflows are much lower in many African countries, and are even negative in some countries, such as Zimbabwe. Ghana, due to a heavily supported structural adjustment program, reveals a different picture (Table 6). External public debt has reached more than 50 percent of national income in Kenya and 100 percent in Nigeria. Every fourth or fifth dollar earned from exports is required for debt service in many African countries (Table 6).

While increases in the ratio of capital versus labor costs run in favor of public works programs, it should be remembered that increases in unit capital costs may induce undercapitalization of public works programs. Public works cannot be efficient with zero capital inputs.

FOOD INSECURITY AND MALNUTRITION OF LABOR-MARKET-DEPENDENT PEOPLE

Food security in Africa is increasingly a problem for labor-market-dependent people. Malnourished rural poor Africans depend for 40 to 60 percent of their income on off-farm nonagricultural sources (von Braun

able 6--Debt indicators for selected African countries, 1978-88

ndicator	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
et inflow of public and publicly uaranteed medium- and long-term oans (millions of dollars)											
Nigeria	1252	1523	1442	803	1246	3779	133	-1188	20	782	209
Ghana	58	120	81	66	56	30	46	62	149	248	210
Kenya	165	326	335	299	212	80	322	27	327	158	75
Botswana	na	na	na	na	na	na	58	41	14	64	11
Zimbabwe	na	na	96	289	466	381	63	10	66	3	-75
External public debt outstanding and disbursed as percentage of GNP											
Nigeria	4.5	5.0	5.5	6.5	8.7	17.7	15.8	17.2	44.2	109.8	101.3
Ghana	5.3	9.6	8.0	4.0	3.6	28.3	22.9	23.6	25.6	44.7	43.9
Kenya	17.9	24.3	25.5	34.4	39.2	43.1	45.8	51.2	51.6	57.9	51.0
Botswana	na	na	na	na	na	na	31.3	47.3	36.2	38.2	37.9
Zimbabwe	na	na	13.8	13.8	19.1	27.9	28.4	31.3	32.4	36.2	36.5
Debt service as percentage of exports of goods and services											
Nigeria	1.2	1.5	1.9	4.6	9.5	18.6	25.4	30.8	23.4	10.0	24.2
Ghana	4.4	4.2	6.0	9.1	6.8	14.2	13.2	12.2	10.8	19.2	19.7
Kenya	8.3	7.5	8.8	17.1	20.3	20.6	21.5	25.5	22.5	28.8	19.4
Botswana	na	na	na	na	na	na	3.8	5.4	4.3	3.7	4.0
Zimbabwe	na	na	2.6	4.4	9.2	31.6	20.0	32.2	22.3	23.2	24.8

Source: World Bank, World Development Report (New York: Oxford University Press, various years).

na = not available.

and Pandya-Lorch 1991). As land scarcity increases due to population pressure, rural poverty and hunger can no longer be effectively addressed as only a problem of the poor in the subsistence farming sector. Rapid employment-creating agricultural growth, which includes technological improvement along with commercialization of the rural economy, remains of highest priority in Africa. Infrastructure and services provision and human capital formation are critical instruments for generating this growth. Without economic growth, the household food security challenge cannot be met. At low income levels (less than U.S. $600 GNP per capita), a close relationship exists between household food security and children's nutritional status (von Braun and Pandya-Lorch 1991), and is observed in most African countries: thus growth remains critical for broad-based improvement of human welfare. In such situations, the combined effects of public works programs on growth and immediate poverty alleviation are particularly attractive.

During the 1990s, Africa's food import gap is expected to rapidly widen and, by the end of the decade, its staple food imports may rise sevenfold from the late 1970s levels (von Braun and Paulino 1990). During the 1980s, food availability at the country level in terms of daily calorie supply—a poor indicator of household-level food security because it does not reflect distribution—remained unchanged in 15 out of the 18 African countries considered in this report (Table 7). Nevertheless, the prevalence of child malnutrition, especially in rural areas, remains high. Only in some countries does the prevalence of urban malnutrition exceed that of rural malnutrition. Child malnutrition is the outcome of complex relationships between underconsumption and morbidity. Similarly, high infant mortality has its root causes in the absolute poverty of households and a lack of health and sanitation services. While infant mortality declined in all countries, the speed of decline since the 1960s remains disappointingly low in some countries, such as Ethiopia, Rwanda, Mozambique, Angola, Malawi, and the Sahelian countries, (Table 7). Distance to health services (and their quality) plays an important role for nutritional improvement as studies in Sudan and Ghana show (Teklu, von Braun, and Zaki 1990; Alderman 1990). This factor stresses one of the links between food security and public works programs: infrastructure creation that improve rural facilities. Similarly, such links exist for human capital formation through education. Food-security-improving economic development in increasingly land-scarce urbanized economies will have to come from increased labor productivity, that is, from better educated populations. Enrollment rates in primary and, especially, secondary schools remain low in many African countries and participation by girls tends to be below that of boys in most of these countries (Table 8).

DETERIORATING INFRASTRUCTURE AND RESOURCE BASE

The United Nations General Assembly designated the decade of 1978-88 as the "African Transport and Communications Decade." Obviously, given the disintegrating transport network in Africa, the 1990s also warrant such an appellation.

Infrastructure in Africa is limited in coverage. Road densities per capita and per square kilometer are very low across Africa; for example, Sudan has only 30 cms of roads per capita and 3 meters per square kilometer, Mauritania has 10 meters per square kilometer, and Niger, 1.5 meters per square kilometer (Table 9). Better infrastructure such as paved roads is even more limited: on average, less than a

Table 7--Selected poverty and malnutrition statistics for 18 African countries

Country	GNP per Capita 1988	Daily Calorie Supply (per capita) 1965	1980	1986	Change[a] 1980-86	Infant Mortality Rate 1965	1988	Preschooler Malnutrition[b] Rural	Urban
	($)					(per 1,000 live births)		(percent)	
West Africa									
Nigeria	290	2,185	2,254	2,146	=	177	103	33.0	na
Niger	300	1,994	2,363	2,432	=	180	133	52.0	27.4
Burkina Faso	210	2,009	2,029	2,139	+	193	137	42*	na
Senegal	650	2,479	2,401	2,350	=	126	78	25.2	15.2
Cameroon	1,010	2,079	2,130	2,028	=	146	92	na	na
Mali	230	1,858	1,720	2,073	+	207	168	33.8	25.7
Mauritania	480	2,064	2,065	2,322	+	178	125	na	32.0
Ghana	400	1,950	1,795	1,759	=	120	88	31.4	22.8
East Africa									
Ethiopia	120	1,824	1,807	1,749	=	165	155	na	na
Kenya	370	2,289	2,225	2,060	-	112	70	na	na
Sudan	480	1,938	2,417	2,208	-	160	106	40.0	26.0
Tanzania	160	1,832	2,310	2,192	-	138	104	26.0	na
Southern Africa									
Botswana	1,010	2,019	2,152	2,201	=	112	41	15*	na
Rwanda	320	1,665	2,007	1,830	-	141	120	31*	na
Zimbabwe	650	2,105	2,137	2,132	=	103	49	13.6	5.2
Mozambique	100	1,979	1,810	1,595	-	179	139	na	na
Angola	na	1,897	2,177	1,880	-	192	135	na	na
Malawi	170	2,244	2,406	2,310	=	200	149	na	na

Sources: Beverly A. Carlson and Tessa M. Wardlaw, A Global, Regional, and Country Assessment of Child Malnutrition, UNICEF Staff Working Paper 7 (New York: UNICEF, 1990).

Ministry of Health and Social Welfare, Nutrition Division, Sudan Emergency and Recovery Information and Surveillance System (SERISS) Survey (Khartoum, 1986).

United Nations Administrative Committee on Coordination - Subcommittee on Nutrition, Update on the Nutrition Situation - Recent Trends in Nutrition in 33 Countries (New York: United Nations, 1990).

World Bank, World Development Report (New York: Oxford University Press, 1990).

[a] + indicates an increase in per capita daily calorie supply of more than 5 percent over 1980-86;
- indicates a decrease in per capita daily calorie supply of more than 5 percent over 1980-86;
= indicates a change of less than 5 percent in either direction.

[b] Measured in terms of below -2 Z-scores of weight-for-age standard unless otherwise indicated by an *, in which case, it is measured in terms of <80 percent weight-for-age standard. These incidences are from various surveys in the 1980s.

na = not available.

Table 8--Selected education indicators for 18 African countries

Country	Percentage of Age Group Enrolled in School							
	Primary				Secondary			
	Total		Female		Total		Female	
	1965	1987	1965	1987	1965	1987	1965	1987
	(percent)							
West Africa								
Nigeria	32	77	24	na	5	na	3	na
Niger	11	29	7	20	1	6	0	3
Burkina Faso	12	32	8	24	1	6	1	4
Senegal	40	60	29	49	7	15	3	10
Cameroon	94	109	75	100	5	26	2	20
Mali	24	23	16	17	4	6	2	4
Mauritania	13	52	6	42	1	16	0	9
Ghana	69	71	57	63	13	40	7	32
East Africa								
Ethiopia	11	37	6	28	2	15	1	12
Kenya	54	96	40	93	4	23	2	19
Sudan	29	49	21	41	4	20	2	17
Tanzania	32	66	25	66	2	4	1	3
Southern Africa								
Botswana	65	114	71	117	3	32	3	33
Rwanda	53	67	43	66	2	6	1	5
Zimbabwe	110	136	92	132	6	45	5	36
Mozambique	37	68	26	59	3	5	2	4
Angola	39	na	26	na	5	na	4	na
Malawi	44	66	32	59	2	4	1	3

Source: World Bank, World Development Report (New York: Oxford University Press, 1990).

Notes: Primary school enrollment data are estimates of children of all ages enrolled in primary school, expressed as the ratio of pupils to the population of "school-age" children (generally 6-11 years). Likewise, for secondary education, with the age range being generally 12-17 years. For some countries, the gross enrollment rate may exceed 100 percent because some pupils are younger or older than the country's standard primary school age.

na = not available.

quarter of the road network is paved, although roads classified in official statistics as "paved" frequently no longer resemble their original label. The deficiency in existing infrastructure coverage is starkly highlighted when it is considered just how far off it is from the desirable level of coverage: for instance, rural Nigeria has only about 3 percent of the all-weather rural road network in place to reach full coverage, whereas India is already about one-third along this path (Mellor and Pandya-Lorch, forthcoming).

Furthermore, the existing network is deteriorating. World Bank studies show that only half of Africa's asphalted roads are in an

Table 9--Selected road coverage statistics for 18 African countries

Country	Year	Main Highways National Roads	Secondary or Regular Roads	Other Roads	Total	Paved Roads	Density of Total Network Total Area	Density of Total Network Arable Area	Total Network Per Capita
		(kms)	(kms)	(kms)	(kms)	(percent)	(km/sq km)	(km/sq km)	(km/capita)
West Africa									
Nigeria	1985	53,209[a]		74,965[b]	128,174	na	0.14	na	0.0013
Northern States	1985	15,370[a]		13,729[b]	29,099	na	0.07	na	0.0009
Middle States	1985	15,907[a]		20,550[b]	36,457	na	0.11	na	0.0021
Southern States	1985	21,932[a]		40,685	62,617	na	0.33	na	0.0014
Niger	1987	9,862		9,138	19,000	17.5	0.015	0.54	0.0028
Burkina Faso	1986	4,576	4,108	2,547	11,231	12.0	0.041	0.42	0.0014
Senegal	1986	3,300	1,260	10,500	15,000	30.0	0.07	0.29	0.0022
Cameroon	1986	7,548	13,666	31,000	52,214	6.0	0.1	0.75	0.0050
Mauritania	1985	2,213	62	5,060	7,335	21.5	0.01	3.76	0.0043
Ghana	1983	3,664	8,884	9,166	21,738	25.0	0.091	0.78	0.0017
East Africa									
Ethiopia	1987	17,914		21,073	38,987	45.0	0.03	0.28	0.0009
Kenya	1984	14,288	37,536	2,770	54,584	12.3	0.09	2.34	0.0028
Sudan	1985	3,160	739	2,700	6,599	59.0	0.003	0.05	0.0003
Tanzania	1984	17,738	42,000	22,157	81,895	3.9	0.088	1.58	0.0038
Southern Africa									
Botswana	1986	2,040	1,023	10,437	13,500	15.0	0.02	0.99	0.0123
Rwanda	1987	2,205[c]		9,865	12,070	7.0	0.4	1.08	0.0019
Zimbabwe	1985	3,557	7,446	66,924	77,927	17.0	0.2	2.85	0.0093
Mozambique	1986	4,800	8,080	13,215	26,095	19.8	0.03	0.84	0.0018
Angola	1984	18,600	28,700	25,000	72,300	12.0	0.06	2.07	0.0073
Malawi	1985	2,671	2,741	6,780	12,192	21.4	0.1	0.51	0.0017

Sources: Road data for all countries, except Nigeria, from International Road Federation, World Road Statistics, 1983-87 (Geneva: International Road Federation, 1988). This source is used, rather than individual national sources, in order to ensure comparability across countries.

Road data for Nigeria from Juan Gaviria, Vishva Bindlish, and Uma Lele, "The Rural Road Question and Nigeria's Agricultural Development," in Nigeria's Economic Development, Agriculture's Role and World Bank Assistance, 1961-88: Lessons for the Future, ed. Uma Lele, Ademola Oyejide, Vishva Bindlish, and Balu Bumb (Washington, D.C.: World Bank, MADIA Working Paper, 1989). Population data from World Bank, World Development Report (New York: Oxford University Press, various years).

[a] Federal and state roads.

[b] Local government area roads.

[c] Included in other roads.

na = not available.

acceptable condition, a quarter need repairs urgently, and another quarter are completely run down (cited in The Courier 1991, 62). Dirt roads are reputedly in a worse condition.

Availability of, and access to, rural infrastructure is critical for agricultural development. Infrastructure improvement tends to coincide with nutritional improvement, as infrastructure is an element of economic and service development. Construction of new roads is important, but given the current infrastructure climate in Africa, maintenance of existing and future roads is vital. Construction and maintenance of roads can be brought about through capital-intensive or labor-based technology. Labor-based technology need not be more expensive (ILO 1988c). For example, in Nigeria in 1987, the per-kilometer cost of an equipment-intensive road was U.S. $16,200 whereas that of a labor-intensive Pilot Public Works Program UNDP/ILO road was only U.S. $6,350 (Gaviria, Bindlish, and Lele 1989).

Maintaining and enhancing Africa's rural resource base is essential for sustaining an agriculture-based development strategy. Public investment is needed for soil improvement, erosion control, furrowing of steep slopes, water catchment in arid zones, and afforestation, to mention some of the well-known required actions. Population pressure on marginal production zones, with its adverse effects on sustainable resource use, can be relieved with increased intensification of agriculture in high potential areas. Laying the foundation for such strategy, again, requires public action, in order to facilitate private initiative and investment. Tapping the potentials of (small-scale) irrigation is an example. The payoffs of infrastructure in high potential areas are higher, as use intensity and spillover effects for commercialization of the rural economy are more promising, than in marginal zones. Thus, improvement of infrastructure and of resource size are related.

The labor share in public works programs can vary according to the task. Empirical evidence is lacking in Africa, but typical experience with building construction, dirt roads, waterworks, afforestation, and anti-erosion works shows increasing labor shares in that order (Table 10). Thus, the highest short-term employment effect per unit of program cost is with resource-sustainability-related programs, that is, with programs whose asset-building effects for income and employment mature in the very long term.

Table 10--Labor intensiveness of selected public works programs in Burkina Faso, Burundi, Rwanda, Nepal, and Tanzania

Public Works Program	Labor Intensiveness Coefficients[a] (Range of Observations)
	(percent)
Anti-erosion works	66.9 - 98.7
Afforestation	70.0 - 74.0
Wells, reservoirs, small irrigation	41.0 - 76.0
Dirt roads	45.6 - 62.0
Building construction (schools, and so forth)	38.2

Source: Derived from J. Gaude et al., "Rural Development and Labor-Intensive Schemes: Impact Studies of Some Pilot Programs" International Labor Review 126 (4 1987).

[a] Percent share of labor costs in total expenditures.

5. EXPERIENCE WITH LABOR-INTENSIVE PUBLIC WORKS IN AFRICA

OVERVIEW AND COUNTRY COMPARISONS

This chapter reviews the experiences of 13 African countries with labor-intensive works programs.[8] Institutional capacities are assessed, major trends in public works program activity are reviewed, and general findings are brought together in this overview section. Country case studies follow and are kept concise by presenting only a summary of information.

Public sector activity in (formal) employment and investment is very diverse in African countries as indicated by the shares of public expenditures on wages and salaries, and on capital (Table 11). For example, the share of government expenditures on wages and salaries ranged from 8.7 percent in Nigeria to 53.6 percent in Burkina Faso. However, these two categories, when combined, tend to account for about 50 to 60 percent of total government expenditure in most of these 18 countries. The capital share, alone, exceeds 30 percent of the budget in 6 of these countries. Thus, even a marginal increase in the labor content of these capital expenditures would make a substantial difference for employment. Similarly, increasing the labor share in "goods and services" may provide for significant employment expansion.

Institutional capacity for designing and implementing public works programs is also quite diverse across Africa, but, contrary to perceptions, the point of departure from which to build stronger institutions for public works programs is not zero in most African countries. Many countries already have public sector institutions as well as international agencies (such as World Food Program (WFP) and ILO), bilaterals, and NGOs active in public works programs. In various countries, the number of line ministries and public enterprises active in public works programs is quite large. Table 12, while not claiming to be comprehensive, gives an overview of these institutions in African study countries. Although the institutional record on efficiency and effectiveness appears to be mixed, successful examples are emerging.

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[8] These reviews are based on fact-finding missions to the countries and on relevant background information.

Table 11--Selected government expenditure by economic category for 18 African countries, 1986

Country	Wages and Salaries	Other Goods and Services	Capital
		(Percentage of total expenditure)	
West Africa			
Nigeria	8.7	17.8	47.5
Niger	19.3	14.5	46.7
Burkina Faso	53.6	10.4	7.5
Senegal	42.0	15.1	12.7
Cameroon	24.2	14.7	50.8
Mali	23.9	na	na
Mauritania	29.9	12.6	26.1
Ghana	35.7	17.1	13.4
East Africa			
Ethiopia	29.8	18.6	38.1
Kenya	33.4	22.0	12.7
Sudan	na	na	7.8
Tanzania	24.8	39.3	18.7
Southern Africa			
Botswana	22.7	na	40.4
Rwanda	25.9	16.2	43.5
Zimbabwe	25.3	16.2	6.9
Mozambique	na	na	na
Angola	na	na	na
Malawi	16.6	26.1	23.8

Source: United Nations Development Program and The World Bank, African Economic and Financial Data (Washington, D.C.: World Bank, 1989).

na = not available.

Pooling (external) resources to strengthen national government institutions, where necessary through training and staff support, is critical for sustained effectiveness. ILO has been catalytic and pioneering in this field. It must be stressed that while adequate central government capacity is necessary for coordinating the setting of interregional priorities, local government capacity is also vital.

The simplistic notion on the part of many governments that food insecurity is a problem of food self-sufficiency is on its way out. During the 1980s, many African countries strengthened their capacity to assess household food security problems. Several countries established "food security units" at high government levels and/or "nutrition units" in ministries of health and/or agriculture. Various "food security strategy" initiatives are also in progress. Improved links between these institutions and public-works-programs-related institutions are needed to foster effective public works programs for food security. In some countries, discussed below, these linkages are already being

Table 12--Government institutions active in public works-related programs

Country	Government Institutions
Nigeria	• National Directorate of Employment • Directorate for Food, Roads, and Rural Infrastructure
Niger	• Coordination Unit for the Program for Minimizing Social Impact of Structural Adjustment (Ministry of Planning) • Ministry of Agriculture
Burkina Faso	• Ministry of Agriculture • National Office for Dams and Hydro-agricultural Development • Directorate General for Rural Roads • Fund for Water Resources and Rural Infrastructure • Ministry of the Environment (Directorate for Forests and Fauna) • Ministry of Works
Senegal	• Directorate for Employment Creation (President's Office) • Ministry of Water Resources • Ministry of Agriculture
Cameroon	• National Office for Forestry Development • Ministry of Agriculture (Planned)
Mali	• National Office for Labor and Employment • Ministry of Social Welfare • Ministry of Forestry and Natural Resources
Mauritania	• Ministry of Rural Development • Executive Secretariat for the Economy and Voluntary Participation
Ethiopia	• Ministry of Agriculture • Relief and Rehabilitation Commission
Kenya	• Ministry of Planning and National Development • Ministry of Public Works
Tanzania	• Prime Minister's Office • Ministry of Communications and Works • Ministry of Local Government
Botswana	• Ministry of Finance and Development Planning • Ministry of Local Government and Lands
Rwanda	• Ministry of Public Works • Ministry of Agriculture and Animal Husbandry • Ministry of the Interior and Community Development
Zimbabwe	• District Development Fund (Ministry for Local Government, Rural and Urban Development) • Ministry of Labor, Manpower Planning, and Social Welfare
Mozambique	• Ministry of Construction and Water
Malawi	• Ministry of Works and Supplies • Ministry of Local Government • Ministry of Labor (Planned)

forged. Not surprisingly, these countries tend to be the relatively "richer" countries, such as Zimbabwe, Botswana, Nigeria, and Ghana.

There is also growing concern over the question of job creation. Rising unemployment is becoming an issue of the highest political priority, as observed in Senegal and Niger. The same governments concerned with unemployment are also concerned with how to create the public infrastructure needed to stimulate growth in the current context of debt and cash-flow problems.

Our review suggests that experience with public works programs for food security improvement is no longer scarce in Africa (Table 13). However, recorded experience remains extremely limited. Discussions with national institutions indicated a high degree of enthusiasm for efforts to improve the effectiveness of links between policies for tackling unemployment, infrastructure and public goods provision, and food insecurity. These three problems rank high in the economic revitalization and poverty alleviation policies of many countries.

Table 13--Experience with public works programs for food security in selected African countries during the 1980s

Country	Experience With Public Works Programs	
	in General	for Food Security
West Africa		
Nigeria	++	0
Niger	++	+
Burkina Faso	++	++
Senegal	+	0
Cameroon	0	0
Ghana*	+	+
East Africa		
Ethiopia	+	++
Sudan	+	+
Kenya	++	+
Tanzania	+	0
Rwanda	++	+
Southern Africa		
Zimbabwe	++	++
Mozambique	0	0
Botswana	++	++

++ A lot of experience (long standing or large programs).

+ Some experience.

0 Little or no experience.

* Country not included in review below.

In recent years, changes in macro-incentives (capital/labor price ratio) and the poverty and food security situation have stimulated governments, such as those of Ghana, Senegal, and Niger, to establish public works institutions and programs. Other countries, such as Nigeria and Burkina Faso, which had earlier experiences on a smaller scale, are in the process of scaling up their public works programs. Some countries have had a long-standing experience with general public works programs (Kenya), while others have had experience with public works programs designed specifically for achieving food security (Zimbabwe, Botswana, and Ethiopia). Senegal, Mauritania, and Mali have also experimented since the 1960s with road, water, and forestry projects, run either as drought relief activities by WFP and NGOs or as ILO pilot projects. Only a few countries have had little or no experience with public works programs, but even they are increasingly debating and considering the instrument. Some countries, for example, Sudan and Mozambique, are constrained by political unrest and, particularly, by limited institutional capacity for developing and maintaining public works programs. Thus, the diverse picture over Africa certainly suggests ample scope for mutual learning from experiences across countries and agro-ecological zones.

There are three major shifts underway in the orientation of public works programs in much of Africa, especially the Sahel. First, there is a concentration of activities sectorally and geographically. Second, there is a shift in public works program's inputs away from only food to also include nonfood inputs and cash. Third, there is an increasing emphasis on private participation in public works programs.

As the potential for public works programs becomes clearer and as the most urgent problems are more clearly defined, a narrowing of investment takes place both by location and by type of project. In Senegal, for instance, rather than attempting to supervise activities all over the country, as in the past, priority targets are being defined. Public works programs are being limited mainly to areas of severe land degradation, high irrigation potential, and urban settlement. The country-wide mandates have given way to greater targeting. At the same time, recently, there was a relative shift in emphasis from rural to urban areas.

Knowledge of what works and what does not work leads to a narrowing of activities away from the "do everything" projects. For example, certain types of integrated rural development projects are being pared down to core erosion-control or waterworks projects. Learning from experience is invaluable for adapting public works programs towards

viability. In Burkina Faso and Niger, for instance, mass tree planting exercises had low survival rates, but community wood lots and gully-erosion control through tree-planting "up-stream of the gully" were more successful. Therefore, there has been a tendency away from the mass planting approach, which generates jobs but few surviving assets, towards smaller, but more sustainable, projects.

There appears to be a move away from only food inputs in public works programs to nonfood inputs and cash as well. In discussions with program planners across Africa, one hears that cash is better than food wages; but this is not a simple issue. Food wages may have an important role to play in areas where food markets are constrained. A survey in Ethiopia (Webb 1989) found that in an area with easy access to markets, 80 percent of people involved in public works programs preferred receiving a cash wage rather than a food wage. In that case, costs saved by the donor, by using capital rather than importing convoys of food to the project site, were simply transferred to the beneficiary. However, in another area where markets were not functioning properly due to lack of infrastructure and enforced state intervention, 80 percent of people interviewed would rather have received food than cash.

FFW projects have been successful in some contexts in preventing death and mass migration. In the successful cases—Ethiopia, Zimbabwe, Botswana, and possibly, Kenya—the institutional framework for rapid implementation of emergency public works programs was already in place and market conditions were right, that is, the type and level of remuneration offered was appropriate to prevailing market conditions. An example from Senegal's urban public works project is instructive in this context, and underlines the importance of comprehensive understanding of labor markets and household behavior for proper implementation of public works: in one town, activities such as cleaning drains and garbage disposal were initiated with only food rations being offered as wages. The maximum number of participants that came each day was around 100. Then, because time was running short, 400 CFA per day were offered on top of the food ration, and overnight, up to 400 people were coming per day. A similar project in another town made the same change, and is now overwhelmed by job requests, and has to ration the number of days each person can work. Clearly, the self-targeting mechanism of public works programs to the poor depends heavily on the wage levels set by project managers.

The bottom line is that a dogmatic preference for cash wages versus food wages is not useful. Actual conditions, including the risk of market failures, should guide the choice of cash versus kind wage-

setting or a combination of the two. Burkina Faso, after a history of an erratic policy process, has accepted a flexible approach:

- If assets are generated on private lands, no wage is paid.
- If work is conducted at the village level (with the whole community), then food should be offered, but for consumption communally at the work site (traditional system).
- Where assets like dams are built, using labor from many communities over long periods (up to 9 months), then cash wages should be used (on this issue, see ILO 1989b).

The third general trend is an increasing emphasis on private participation in labor-intensive public works programs, in the sense of private community-level identification and implementation of projects. The vanguard of the trend in commercial sector involvement is the Agence D'Execution Des Travaux D'Interet Public Contre Le Sous-Emploi (AGETIP) urban public works in Senegal, closely followed by a similar program in Niger and, soon, one in Benin, and possibly, Burkina Faso. AGETIP is a quasi-parastatal, that is, a commercially-oriented unit that falls under the President's Office. It supports contracts put out for bidding by small private firms. Projects like drain cleaning, road paving, and clinic and school rehabilitation are implemented privately by small firms with a minimum of 33 percent of costs going to labor wages. While this experiment has certain technical and organizational constraints, it is a popular idea that many other countries are rushing to adopt.

These three overall trends—geographical and sectoral concentration, increasing capital inputs versus food inputs, and increasing private involvement—show

- Certain lessons have already been learned from public works programs, and the 1980s served as years of experimentation.
- The trends are for reorientation, not for reversal or for cancellation of public works programs. Public works programs have become a firm priority tool used in development plans for poverty alleviation.

Labor and technical and institutional constraints have limited the effectiveness of public works programs up to now. Some Sahelian countries have put forward lack of labor availability as a reason for not doing public works projects. In Niger and Burkina Faso, it is

widely complained that massive out-migration of men during the season when public works projects can be implemented leaves behind a labor force of only women and children. This view overlooks the targeting potential: in Ethiopia and Zimbabwe, women are certainly much involved in food-for-work projects. It therefore becomes a matter of choosing the kinds of projects most suited to the labor on offer. Of course, other, more cultural, factors may also be pertinent. The Tuareg in Niger and Mali look down on manual labor. The Bayla, in eastern Burkina Faso, have a cultural aversion to going underground, so well-digging projects cannot be completed in those villages. Pastoralists in Niger, who ride horses or camels, rarely participate wholeheartedly in building roads across the desert, and farmers in Burkina Faso, most concerned with water availability, are not likely to tend trees. These examples simply speak of the need for better community involvement in project identification, and a more thorough testing of pilot approaches. The scale and design of projects from the outset are crucial to their sustainability.

This raises the question of technical constraints. Projects, even if fully supported by a community, need to be technically sound. The AGETIP project in Senegal, for example, has established a commercially-based procedure for tendering and implementing projects, but its technical appraisal and supervision of projects (whose primary focus is employment creation) is poor. For example, sewage systems, formerly totally blocked since 1962, were opened, but the banks were not stabilized and broken concrete lining was not replaced, and, hence, after a rain shower, sand begins to fill the drains again. Both problems should have been identified at the appraisal stage and during implementation, but were not. It is this technical capacity of agencies that must be strengthened.

Logistics make some projects very hard to implement. For example, in dry areas, there is the problem of water availability; yet, water is needed for tree planting or even for mixing cement. If supply is not carefully planned, high costs could be incurred in shipping water long distances by lorry. Land-locked countries have the added distance and temporal problem of transport logistics from the nearest ports. Projects in Burkina Faso have been stalled while waiting for spare machinery parts, and FFW projects in Niger have been halted by delays in moving shipments of food through Nigeria or Benin.

Institutional constraints, already discussed, are severe in all countries. Real coordination is frequently missing between line ministries involved in the same project. For instance, in Burkina Faso,

a special public works project suffered in its pilot phase because it was too closely involved with only one out of a group of relevant ministries; a clinic was built under the supervision of the Ministry of Labor and Employment, but it took three more years before the Ministry of Health provided a pharmacist and drugs.

At a more disaggregated level, the absence of middle management skills and of provincial technicians can restrict the capacity of ministries to implement private AGETIP-style projects. Nigeria has an important institutional strength useful for upscaling public works programs: its decentralized organization at the state level. Efforts are being made to address institutional concerns in the projects themselves. For example, small rural projects in Niger and Cameroon aim to promote the capacity of local administrators and technicians (as well as of NGOs) to identify, appraise, and implement small projects. Similarly, the semiprivate Agence Nigerienne De Travaux D'Interet Public Pour L'Emploi (NIGETIP) project in Niger also aims to support projects in secondary and tertiary towns, following recommendations in Lome IV, but it specifically excludes the idea of firms from Niamey bidding for, and implementing, projects in Zinder. This will lead to difficulties.

Assumptions about availability of institutional capacity for decentralized projects are usually overoptimistic but that does not mean that such capacity cannot be helped into existence. Burkina Faso and Cameroon both have well-developed "groupements villageois," and many active grassroots NGOs. Most countries have stated commitments to decentralized administration. It remains for ministries, donors, district administrations, and village groups to be coordinated towards unified goals of poverty alleviation, using well-defined tools. Donor initiative could have a high pay-off. Of course, the difficulty is that these efforts at increasing coordination and unifying goals are occurring right in the midst of structural adjustment, when parastatals are being abolished, department functions are being changed, and uncertainty is widespread.

Higher population density may be useful for effective implementation of labor-intensive programs, as suggested by the Kenyan and Rwandan experiences. In addition, the Rwanda case underlines that an agricultural sector under heavy population pressure and environmental stress demands renewed attention to public goods provision, both to improve the resource base as well as to provide employment to marginalized populations. Afforestation, terracing, and erosion control measures figure prominently in these highland areas. The food security

effect of public works, both in the short and in the long run, can be expected to be particularly large in such an environment.

Yet, low population density should not diminish the effectiveness of public works programs—Botswana's case, in particular, highlights how government commitment, institutional support, and fiscal resources can make it much easier to implement productive public works programs for food security. In fact, much can be learned from Botswana and Zimbabwe's success in applying the public works instrument to combat absolute poverty and food security problems during the drought in the early 1980s, for other drought-prone areas in Africa. Botswana and Zimbabwe's successful application of public works programs also underscores the potential effectiveness of such instruments in neighboring countries such as Mozambique and Angola, when political conditions permit.

Individual country reviews of experience with public works programs, presented below, are structured along the following lines:

- Food security;
- Employment situation;
- Potentials for labor-intensive public works programs; and
- Experience with public works programs.

The reviews underscore great diversity in all four of these aspects across countries. This argues for country-specific approaches to public works policy design that take prevailing potentials into account and capitalizes on institutional capabilities.

NIGERIA[9]

Food Security

Nigeria's recent economic history is dominated by the discovery and exploitation of oil, the resulting distortion of the economy, and the Structural Adjustment Program (SAP) embarked upon in 1986. These features impinge on the country's short- and long-term food security situation.

Oil provides a substantial share of the country's foreign exchange earnings and government revenues, and the decline in oil prices in the 1980s was a shock to this largest oil-exporter in Africa. A real decline in Gross Domestic Product (GDP) of 3.4 percent per year was experienced between 1980-1985, which, combined with an annual population growth rate of 3.3 percent, resulted in a per capita GDP decline of nearly 7 percent per year during this period.

In response, the government initiated the SAP in 1986, which affords the agriculture sector a central role in the economic recovery of Nigeria. The SAP aims to generate employment, reduce the foreign exchange drain from food imports, produce exportable surpluses, provide raw materials for the industrial sector, and provide food at affordable prices to the urban population . The SAP has reversed the bias against export agriculture, and has devalued the naira.

While there is broad agreement on the existence of a food security problem, there is no clear consensus on its actual magnitude. A 1985-86 household survey found 17 percent of the population to be food insecure, while a survey in 1990 registered 13 percent (World Bank 1990e). A 1983 food intake study indicated substantial variation in the levels of calorie and protein adequacy across Nigeria (World Bank 1990e). Food poverty evaluation, based on the 1985-86 household survey, showed high food poverty in the urban areas of Ogun, Kwara rivers and Borno states, and in the rural areas of Ogun and Bendel states (World Bank 1990e). Food poverty is generally higher in the southern states, drought-prone Borno being the only major exception. The Sahelian zones of the northern states seem to be especially vulnerable to food poverty, particularly in drought years.

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[9] This review on Nigeria is based on a fact-finding mission to Nigeria and report by Matthew Warning, IFPRI (1991).

A 1983/84 national survey found 21 percent of urban preschoolers and 20 percent of rural children to be underweight (World Bank 1990e). The incidence of underweight children across age groups and ecological zones shows a complex picture. The southern states are not clearly worse off than the northern states.

Employment Situation

The current distribution of Nigeria's labor force is essentially a relic of the boom days of the oil economy. As urban employment expanded and the agricultural sector was neglected, rural-urban migration drained the rural areas of manpower. When oil revenues began to decline in the early 1980s, retrenchment in the economy lead to rapidly rising urban unemployment and the beginnings of a reverse (urban-rural) migration-flow which contributed to an estimated 25 percent expansion of the rural labor force between 1983 and 1985. The government of Nigeria is extremely concerned about the current and projected level of unemployment and underemployment in the country (Hussain and Obi 1990).

The oil boom was the central force determining wage development. Demand for labor in the nonagricultural sector, combined with the lack of technological change in the agricultural sector, resulted in:

1. a significant gap between rural wages in the north and urban wages in the south, indicating labor market imperfections and/or high cost of relocation; and

2. declining real wages in both sectors during 1976-85, except during the second oil boom, 1979-81 (Lele et al. 1989).

Hussain and Obi (1990) provide an overview of the employment problem in the context of structural adjustment and demonstrate the promising scope for using labor-based technology in infrastructure creation to address the employment problem.

Potentials for Public Works Programs

The poor condition and inadequate network of all-weather roads have long been recognized by the government to be critical constraints on agricultural development (Gaviria, Bindlish, and Lele 1989). High transport costs have discouraged farmers from switching from subsistence

to market production and have inhibited the adoption of agricultural technology.

Considerable resources have been devoted to the construction and rehabilitation of rural roads. For instance, the World Bank-supported Agricultural Development Projects (ADPs) constructed or rehabilitated 9,300 kms of roads between 1976-87. However, maintenance has been inadequate, and thus has lead to the deterioration of a large proportion of the roads constructed. At the present rate, the World Bank estimates that it will take more than 30 years to clear the backlog in rural road maintenance.

Since 1986, the government has committed resources to improving the rural road situation. The Directorate of Foods, Roads, and Rural Infrastructures (DFRRI), was established in 1986, allocated about 10 percent of all capital expenditure (net of foreign financing), and given the mandate of constructing new roads on a large scale. However, despite the need for maintenance, DFRRI concentrates on building roads to open up new areas. Maintenance is generally considered to be the responsibility of local governments, but these have apparently not been up to the task. The ADPs, on the other hand, have shifted their emphasis from new construction to rehabilitation and maintenance of existing roads. In addition, some local communities have initiated self-help construction, rehabilitation, and maintenance projects.

Construction, rehabilitation, and maintenance of rural roads will be a major activity in the foreseeable future. In recognition of this, considerable effort is being exerted through a joint program of the National Directorate of Employment (NDE), the ILO, and the United Nations Development Program (UNDP), to influence the choice of technology for these activities in favor of labor-based methods (see below). Preliminary estimates of relative construction costs suggest considerable savings from the use of labor-intensive methods.

The government has a long history of involvement in large-scale irrigation schemes, and has generally had to finance them itself, due to donor reluctance—these projects have high costs and low efficiency. However, small-scale, privately-owned, valley-bottom irrigation, using small tubewells and pumps, is seen as the most promising source of growth for the north, with a very high potential for the other regions as well.

Soil erosion is a serious problem in the north and the south. Tree-planting as a public works project is a possibility, although more

emphasis seems to be on on-farm measures. Reservoirs and ponds are also identified as potentially productive interventions.

Experience with Labor-Intensive Public Works Programs

In discussions with Nigerian officials, a general consensus emerged that, except during the colonial era, very little attention has been given to using labor-intensive methods in the creation and maintenance of public infrastructures. In the few cases where such methods have been used, it has not generally been a matter of conscious intent, but rather one of necessity. A fundamental bias towards equipment-intensive methods seems to pervade the Nigerian public and private sectors. Several reasons have been given for this bias:

1. The overvaluation of the naira distorted the capital/labor price ratio in favor of equipment-intensive methods.

2. Registration of contractors (often used in carrying out public sector projects) is based on size of plant holdings; selection of contractors is often based on their capacity to mobilize a certain type and number of equipment units.

3. Project designs, completion times, and specifications are all geared to equipment-intensive methods.

4. The tradition of using equipment-intensive methods due to the above factors has left engineers without technical capacity in the use of labor-intensive methods.

Two developments in the later half of the 1980s should be instrumental in correcting this bias against using labor-intensive methods for public works programs. The first development is the devaluation of the naira as part of the SAP. With a more realistic labor/capital price ratio, the advantage of shifting relative factor-intensity towards labor-intensive methods is becoming increasingly obvious. The second development began with the establishment in 1985, by the Federal Ministry of Employment, Labor, and Productivity, of the Chukwumah Committee to come up with strategies for dealing with the perceived problem of mass unemployment. In response to the Chukwumah Committee's recommendations, the NDE was established in 1986. The NDE organized its activities around four core programs: 1) youth employment and vocational skills development programs; 2) an agricultural program;

3) a small-scale industries and graduate development program; and, of most interest to this research, 4) the Special Public Works Program.

The Special Public Works Program was designed to identify and execute labor-intensive projects using unemployed citizens in their own local government area. It also aimed at creating temporary mass employment, advancing the maintenance culture in the country, and engaging in the construction and maintenance of community buildings, public roads, and other public works of social interest. Apparently this program underwent bifurcation and renaming sometime after its creation in 1987. The designation "Special Public Works Program" now refers to a program to provide emergency employment for a specific target group: graduates from universities, polytechnics, and colleges of technology, and school leavers. Participants are involved in development activities such as environmental beautification and construction and maintenance of public buildings.

An Interesting Test Case

The ILO/UNDP-assisted Labor-Based/Light Equipment-Supported Rural Infrastructure Works Program is a program of great interest from a research perspective. It aims at long-term change in the use of available resources, particularly labor, in the construction, rehabilitation, and maintenance of rural infrastructure works. It has several specific development objectives:

1. To shift construction and maintenance technology in favor of locally available resources instead of foreign resources.

2. To develop the necessary capacity in government institutions at the federal, state, and, in particular, local level, as well as in local communities, to plan and implement infrastructure programs, using locally available resources and labor-based methods.

3. To develop the appropriate capacity in local contractors, cooperatives, and nongovernment entities for undertaking infrastructure works making effective use of locally available resources, in general, and labor-based methods in particular (ILO 1988c).

This program is being undertaken in four phases. Phase I, already completed, involved a Pilot Program for nine states. Phase II, the

demonstration/training phase, is nearing completion: in 1988, a Demonstration/Training Project was established to demonstrate labor-based techniques; provide preliminary training to core technical personnel from the nine pilot states so as to develop local capacity to assist in the implementation of the Pilot Program; and generate basic data on costs, employment, and other variables of interest. Project activities include construction of a new rural road, rehabilitation and maintenance of an existing road, and construction of a small-scale earth dam, gravity-flow irrigation scheme. Approximately 120 engineers have been trained in hands-on planning and implementation of labor-based/light equipment-supported construction of rural infrastructures. The NDE sees its long-term role not as an implementor of such projects, but rather as a technical advisor to the implementing bodies.

Upon completion of Phase II in the last quarter of 1990, Phase III, the Pilot Program, is scheduled to begin. It is planned to last four years and will involve the implementation of projects identified in Phase I in the nine states. These projects will involve roads, irrigation, rural water supply, conservation (erosion control and afforestation), and social infrastructures (schools, hospitals, and markets).

Training will also be a major concern in Phase III. By drawing trainees from all states in the federation, this training will serve as preparation for nationwide expansion of the use of labor-intensive methods in Phase IV.

NIGER

Food Security

Despite severe agro-climatic constraints, Niger has maintained an impressive record of balancing its food supply and demand during the 1980s. Except during drought years, Niger has attained almost 100 percent of its annual food supply target of 237 kgs of cereals per capita. The 1988/89 harvest was especially good, providing an aggregate of 333 kgs, or 2,847 kcals per capita per day (FAO 1990a). However, the sustainability of this balance is not assured: a population growth rate of 3.2 percent per annum, widespread ecological degradation, unreliable rainfall, and a downturn in the economy have focused attention on the longer-term problems of food security.

Rainfall and land degradation are of immediate concern to the 90 percent of the population that depends on agriculture and livestock for its living. With 75 percent of the country classified as desert, and few areas receiving more than 600 mm of rain per annum, there is no buffer against drought. For example, cereal production in 1984 was 40 percent below that of 1983, while numbers of cattle in 1986 were 50 percent lower than in 1972 (AFC 1987).

The result of such droughts in human terms was that 20 percent of rural preschool children were found to be wasted in 1984/85 (FAO 1990a). Surveys in 1986/87 continued to find rates of 9 percent wasting and 36 percent stunting amongst preschoolers (UNACC-SCN 1990; Kahn 1990). In 1991, up to 1.6 million farmers and pastoralists in the southeast and north are expected to require food assistance totalling 96,000 metric tons, because of poor rains (USAID 1991).

The droughts of the early 1980s coincided with other setbacks in the economy. Niger's economic fortunes have been tightly linked to its uranium industry. The contribution of mining to GDP almost tripled from 1975 to 1980 with increased production and rising prices. The Government of Niger (GON) initiated ambitious investments aimed at accelerating growth. However, a decline in the demand for uranium after 1981 led to a stalling of the growth program. GDP growth has been negative since 1982; external debt has risen from 17 percent of GDP in 1980 to 51 percent in 1990; and Gross National Product (GNP) per capita was lower in 1989 than in 1966 (UNCLDC 1990b; Tinguiri 1990). These negative trends have made the food balance increasingly tenuous, pushing poverty and food security into the policy arena.

Food Policies and Poverty Alleviation Strategies

The goal of food self-sufficiency assumed major importance in a Consolidation Program of 1983-85. Structural adjustment was initiated in these years, leading to progressive withdrawal of public control over the economy. GON has maintained its commitment to food self-sufficiency by focusing 36 percent of its current three-year Investment Plan (1990-92) on rural development—principally agricultural intensification, rural credit, and irrigation (FAO 1990a). This strategy lays great emphasis on the concepts of 'private responsibility' and 'participatory development.'

More specific poverty concerns are articulated in the 1989 Program d'Attenuation des Couts Sociaux de l'Adjustement (PACSA). While it is noted that "the entire population is directly suffering negative consequences of the crisis," PACSA recognizes that the most vulnerable groups in the country are poor farmers, particularly in the southeast and northeast, unemployed youth (47 percent of the population is aged less than 15 years), and the handicapped (Niger 1989). It also proposes that the best means of tackling poverty and food insecurity in these groups is targeted employment generation.

Employment Situation

Niger's economic crisis has had a marked effect on the labor market. Between 1981 and 1987, almost 20 percent of the formal sector work force was laid off, 5 percent in 1986 alone (Niger 1989; Tinguiri 1990). This retrenchment was accompanied by a freeze on civil service wages and recruitment between 1982-88. In 1988, job seekers in Niamey numbered 26,000 against 5,400 available jobs (Niger 1990). For the country as a whole, 10 percent of the active work force is considered as unemployed/underemployed (CERDI 1990). The informal sector is not sufficiently strong to absorb this level of job demand.

The aim of PACSA is to combine investment in public goods with large-scale employment generation. During a three-year-period, hundreds of rural and urban projects will create over 10 million workdays, at a cost of U.S. $16.5 million (Niger 1989).

Potentials for Public Works Programs

Three main areas have been identified by GON for priority consideration in its public works program:

- Erosion/desertification control is an urgent priority—dune fixation, windbreaks, terracing, and reforestation are crucial to reverse soil degradation in 80 percent of the rural areas.

- Infrastructure development remains essential. Sound investment in roads over the past 15 years has contributed greatly to the country's present positive food balance. GON's commitment to this priority has not declined: 20 percent of the 1990-92 economic plan is allocated to rural road construction, while PACSA aims to build 600 kms of road in three years by labor-intensive means.

- Irrigation continues to hold center-stage in the country's food security plans. The country has 7,000 hectares under modern irrigated production (double-cropping) and a similar area under traditional irrigation, but wishes to increase the modern area to 13,000 hectares by 1995, and double national rice production by the year 2000 (FAO 1990a).

Experience with Public Works Programs

In the early 1980s, many small FFW projects were initiated as drought relief measures by NGOs, such as CARE, SOS Sahel, and CARITAS. Most had emergency status, with a limited focus on the sustainability of assets generated; few were evaluated. Since then, NGOs have continued labor-intensive activities. In 1985, there were 180 small, community-based projects underway (World Bank 1988a). CARE's 'Galmi project' is one of the largest currently ongoing. It involves soil conservation and irrigation development with 800 participating households (Burke 1990). Many participants are women, owing to the widespread seasonal migration of males to coastal countries. This has been perceived as a constraint for public works programs, but it should not be, since the targeting of income benefits would be much easier, and female labor is generally as effective as male labor.

Larger-scale public works programs have been implemented by donors such as WFP, World Bank, GTZ, UNDP, and ILO. Conservation, in the form of integrated watershed development, is taking place at the Keita Valley

project. This multi-donor operation (costing over U.S. $34 million), involves 5,000 households in dune fixation, reforestation, and terracing. Road infrastructure has been built labor-intensively as part of the World Bank's 5th Roads Project. Between 1987 and 1989, over 60 kms of rural roads were constructed manually at no greater cost than roads constructed by heavy equipment (Niger 1989). Roads also featured prominently in UNDP/ILO's activities in Maradi region, where 30,000 workdays were spent on feeder roads, which cost less per kilometer than those roads using machinery (ILO 1987b). Irrigation development is a primary goal of both GTZ's Tahoua project and the World Bank's microprojects in Tahoua, Dosso, and Niamey regions. All three activity types will be greatly expanded once PACSA is fully operational. Niger's experiences with selected public works programs are summarized in Table 14.

Urban public works were initiated only recently in the context of a World Bank project called NIGETIP, following the model of AGETIP in Senegal (see review of Senegal below). As a pilot phase, five urban service projects are being implemented in Niamey by small private firms under contract to a parastatal contract-clearing agency. Over one year, these will generate 3,500 workdays for paving and desanding roads, drain clearing, and refuse collection. If expanded in 1992, over 200 firms will bid for contracts that are purposely labor-intensive.

Summary and Policy Conclusions

Public works programs are already accepted in Niger as important instruments in a national food security strategy. Employment creation is a primary GON objective, and it is recognized that this goal can be combined with required development activities in the spheres of erosion control, road infrastructure expansion, and irrigation. However, in-depth evaluations of past and ongoing activities, with a focus on logistical and institutional constraints, remain to be conducted. Such evaluations (necessary for effective planning) need to take into account: a) difficulties in mobilizing labor in the low population density regions most urgently requiring anti-erosion activities, b) access to water for reforestation in the dry zones, c) the cost-effectiveness of various irrigation structures, and, d) the coordination of remuneration policies amongst the many actors currently involved in public works.

Table 14--Selected country experience with public works programs: NIGER

Objectives/ Functions	Years	Area Covered	Costs		Workdays Created	Output Created	Project Type[a]	Current Status	Main Donor	Donor Assessmer
			External	Government						
			(U.S. $ million)		('000)					
Conservation	81-87	Tahoua region (148 villages)	3.3	...	?	Reclaimed 3,000 hectares trees, bunding, roads	C	Ended	GTZ	Positive
Conservation	88-92	Tahoua Phase II (148 villages)	4.7	0.5	?	Reclamation, irrigation, trees, training	C	Ongoing	GTZ	...
Conservation	87-90	Galmi district (800 households)	?	...	?	Reclaimed 400 hectares bunding, trees	F/V	Ended	CARE/ WFP	Positive
Conservation/ irrigation	90-93	Galmi Phase II (800 households)	0.5	...	20.0	Reclaim 500 hectares, 700 check dams, trees	F/V	Ongoing	CARE/ WFP	...
Rural development	87-89	Maradi region	0.4	...	36.0	Wells, roads, trees, dune fixation	F/C	Ended (Pilot)	UNDP/ ILO	Mixed
Conservation	87-91	Keita district (5,000 households)	33.0	1.2	8.3	Reclamation, dune fixation, windbreaks	F/C	Ongoing	WFP/ FAO/ UNDP/ USAID	Positiv
Rural development	89-95	9 districts (7,000 households)	17.1	0.9	?	Irrigation, trees, reclamation	C	Ongoing	World Bank	Mixed
Urban services/ infrastructure	90-92	Niamey	?	?	3.5	Paving, drains, refuse collection	C	Pilot	World Bank	...
Infrastructure	92-94	Country	16.5	?	10,000.0	Reclamation, trees, roads, irrigation	C	Proposed	?	...

[a] F = food wage; C = cash wage; V = voluntary participation (no wage).

BURKINA FASO

Food Security

Burkina Faso is one of the very few African countries that have increased their domestic food availability during the 1980s. Harvest and imports in 1989/90 together provided 234 kgs of cereal per capita for the year, equivalent to 2,800 kcals per day (World Bank 1990b). Nevertheless, with GNP per capita of only U.S. $190 in 1987, Burkina Faso remains one of the poorest countries in the world, and malnutrition persists as both a seasonal and a chronic problem affecting several regions and socioeconomic groups (FAO, Food Policy and Nutrition Division 1988). For example, malnutrition peaks are recorded at the end of the dry season and at harvest, mostly in the 11 provinces that comprise the densely-populated Central Plateau and the semi-arid northern regions (Haggblade 1984; USAID 1990b). At such times, chronic malnutrition (stunting) is found in up to 65 percent of preschool children, and acute malnutrition (wasting) affects 5 percent (Hayward 1990; World Bank 1990b). Food insecurity is primarily a problem for the poor. Caloric intake is highly correlated with income levels: poorer households (some 37 percent of the population in these areas) may consume up to 1,000 kcals per capita per day less than richer households (ESSEC/CEDRES 1988; Reardon and Matlon 1989).

Food Policies and Poverty Alleviation Strategies

The People's Development Program (PDP), instituted after the political changes of 1980, first made explicit a government commitment to improved living conditions for the poor, reduced unemployment, and food security and self-reliance. The PDP committed 23 percent of its funding to agriculture and 12 percent to human resource development (UNCLDC 1990a). In 1986, the PDP program was replaced by a Five-Year Plan which furthered previous goals, but with increased emphasis on mobilizing human labor resources for participatory development: most investment went to irrigation (24 percent), followed by rainfed agriculture (20 percent), and transport (18 percent) (UNCLDC 1990a).

In 1990, a donor-assisted Structural Adjustment Program has been negotiated to strengthen self-adjustment principles incorporated into the Five-Year Plan. The new adjustment policies are focused on enhanced agricultural and private sector productivity, but the promotion of basic

education and health care for the poor, and employment creation, in particular, remain top priorities (UNCLDC 1990a).

Employment Situation

Between 1979 and 1988, the economy registered an average annual growth of 4.9 percent, exceeding population growth (UNCLDC 1990a). While this was a considerable achievement, job opportunities did not greatly expand. Agriculture is the main employer, occupying 90 percent of the population and contributing 40 percent to GDP (FSO 1988; ILO 1989c). Yet, since productivity is based on unreliable rainfall and a fragile resource base, inter-annual fluctuations in agricultural output remain large. Population density reaches 60 persons/km^2 in the central and northern regions, where resource degradation is well advanced and annual rainfall is below 650 mm (World Bank 1990a).

One effect of high population density in resource-poor regions is huge rural-urban migration and emigration. Despite one of the highest rates of out-migration in West Africa (over 2 million people work outside the country), urban growth averaged 8 percent per annum between 1975 and 1985, with that of Niamey averaging 9.7 percent (Wetta 1989). Although urban wage-earning employment tripled during the same period, with the public sector taking the largest share (reaching a total of 40,000 employees in 1989), this has not kept pace with demand. Since 1985, the public sector has been retrenching its work force (Wetta 1989). Formal unemployment was 11 percent in 1985.

Potentials for Public Works Programs

Burkina Faso's infrastructure deficiencies mirror those of other landlocked Sahelian countries: inadequate rural roads, lack of erosion control structures, limited irrigation facilities, and insufficient health and education facilities. Road infrastructure, for example, is a matter of strategic importance to this landlocked country. Investment in this sector has therefore been large, resulting in 350 kms of new roads per year between 1974 and 1988 (UNCLDC 1990a). Continued expansion of the network is a primary objective of the Government of Burkina Faso (GOBF), as delineated in the Transport Master Plan. The latter is committed to extending rural roads in both food surplus and deficit regions. Public works potential in this road expansion is high. An ILO study has shown that roads built capital-intensively create only

0.4 workdays/m^2, compared with labor-intensive roads which generate 5.0 workdays/m^2 (ILO 1989c).

Land degradation is spreading. Cultivation on the barren fields of the Central Plateau causes soil losses of 16-20 tons per hectare per annum (World Bank 1990a). Heavy conservation tasks, such as soil- and stone-moving for terracing, are hampered by the seasonal migration of males, which might be stemmed by the incentive of public works programs provision.

Area under irrigated agriculture, mostly rice and vegetable cultivation, has grown by almost 2,000 hectares per year since 1982, reaching a total of 15,000 hectares by 1989 (World Bank 1990b). However, this is only 15 percent of the identified irrigation potential and this sector could be much expanded through labor-intensive works (Wetta 1990).

Public sector recruitment in the health and education sectors has continued while, in all other sectors, it has been frozen. However, a severe shortage of physical stock in the rural areas results in an 80 percent adult illiteracy rate and infant mortality levels of 126 deaths per 1,000 live births (Sadik 1990). This physical stock could also be expanded through public works programs.

Experience with Public Works Programs

Burkina Faso has an unusually rich experience with public works programs:

- Since 1968 (to the present), Catholic Relief Services (CRS) has sponsored dry season FFW projects, mainly erosion-control (80 percent of projects), well-digging, and dams. Seventeen thousand tons of food have been distributed per annum. Projects are requested by the villages.

- From 1969 to 1976, WFP supported dam and reservoir construction through FFW. In 1974/75, drought relief projects were added for reforestation and road building.

- From 1971 to 1980, and from 1982 to 1987, the World Bank sponsored three successive rural development projects aimed at rural development through voluntary labor participation.

- From 1975 to 1980, ILO implemented a pilot program of labor-intensive erosion control and reforestation works designed to test the feasibility of employment creation projects.

- From 1987 to the present, the Environment Ministry has used public works programs to move 3,000 households out of the Red Volta Forest Reserve (where they were tolerated for decades, despite fuelwood depletion), and resettle them outside. FFW rations (which help support the transition) are offered to these households for reforestation work in the Reserve—"Food-For-Trees."

The early pilot programs were sufficiently promising for GOBF, UNDP, and ILO to initiate a large Special Public Works Program covering four provinces. From 1982 to 1988, conservation and infrastructure activities provided 805,000 workdays of employment (ILO 1989c). Labor was paid one-third of the official minimum wage. Studies show that 72 to 80 percent of the income earned in the public works programs was spent on food (ILO 1989c). The program was suspended in 1988 for an evaluation which culminated in a national seminar/debate on public works in 1989. This debate resulted in two crucial resolutions:

1. Public works programs should be a key instrument in the implementation of GOBF development strategy. Technical ministries dealing with roads, forestry, physical infrastructure, irrigation, and drought relief should adopt labor-intensive methods where technically and economically feasible (UNDP 1990c).

2. Remuneration policies for public works programs should be consistent amongst all NGOs, donors, and GOBF. In principle, no remuneration would accompany work that is conducted on land held privately by individuals; food rations may be considered for village-level activities, but should preferably be paid in bulk to village leaders and consumed communally on the work site; and cash wages should be paid for longer-term, cross-community works (such as roads and dams).

An 18-month extension of the ILO/UNDP program is expected in 1991, creating 4,500 days of employment on rural and urban roads, urban drains, and watershed rehabilitation (Burkina Faso, Office National de la Promotion de l'Emploi 1988; UNDP 1990c). Most of the 120 NGOs in Burkina Faso and many multilateral donors (such as WFP and the European

Economic Community (EEC)) are also considering greater funding for public works programs.

Summary and Policy Conclusions

The national debate on the role of public works programs in Burkina Faso has been a salutary process. Many successes have been widely documented, while technical and institutional constraints have also been examined. Table 15 highlights Burkina Faso's experiences with public works programs. It has been realized that

1. villagers must participate fully in project identification if long-term sustainability of assets is desired;

2. technical supervision from government line ministries must be strong, and, for this to happen, the delegation of responsibilities between ministries must be very clear;

3. the unskilled work force needs to be trained for long-term multiplier effects;

4. careful experimentation with technical soundness of activities should precede full project implementation; and

5. the socioeconomic characteristics of potential participants must be well understood. It is hard, for example, to mobilize pastoral populations to construct roads when they eschew heavy manual labor and travel cross-country by camel.

Table 15--Selected country experience with public works programs: BURKINA FASO

Objectives/ Functions	Years	Area Covered	Costs		Workdays Created	Output Created	Project Type[a]	Current Status	Main Donor	Donor Assessment
			External	Government						
			(U.S. $ million)		('000)					
Waterworks	69-74	Country	?	...	850	Dams, reservoirs, wells	F	Ended	WFP	?
Rural development	71-87	Country	40.0	?	?	1,300 wells, 270 kms roads, 30,000 hectares erosion control, 1,100 cereal banks	V/F	Ended	IBRD/ WFP	Mixed
Conservation	75-80	2 provinces	3.0	?	770	2,600 hectares erosion control, 260 kms roads, 150 hectares trees, 88 wells, 52 cereal banks	C/V	Ended	ILO/ UNDP	Mixed
Rural development	82-87	Central plateau (40 villages)	5.2	0.3	805	Trees, schools, clinics, erosion control	C/V	Ended	UNDP/ ILO/ Holland	Positive
Irrigation	86-91	Volta Valley (1,600 households)	0.2	?	1,300	Irrigated perimeters, trees, dams	F	Ongoing	WFP	Positive
Rural development	89-91	Country	41.4	8.9	3,400	Maintain 8,000 kms roads, create 2,200 kms roads, 1,600 clinics, schools, etc.	F/C	Ongoing	WFP/ ADB/ IBRD/ France	...
Conservation	88-92	Country (38,000 households)	20.0	6.2	13,500	Erosion works: 30,000 hectares; trees: 12,000 hectares; dams, wells, terracing	F/V/C	Ongoing	WFP	...
Infrastructure	91-92	Poor provinces and 17 towns	0.6	...	5	Roads, drains, training, watershed development	C	Proposed	UNDP/ ILO/ WFP	...

[a] F = food wage; C = cash wage; V = voluntary participation (no wage).

SENEGAL

Food Security

Since independence, Senegal's GDP has grown at an annual average rate of only 2.4 percent, the lowest rate of any African country not affected by military conflict (World Bank 1989d). This low rate is explained in part by fluctuating world prices for Senegal's long-standing primary export earner (groundnuts), an overvalued currency, urban consumer-oriented subsidy and wage policies, and endemic drought in large parts of the country since the mid-1970s (EIU 1990). Consequently, although harvests have been good since 1986, mean daily consumption figures of only 1,900 kcals per capita were found in villages of the Sahelian zone in 1989, and of 1,950 kcals per capita in the Sudanian zone (Reardon 1990).

Food Policies and Poverty Alleviation Strategies

To counter these problems, Senegal, in 1979, became the first African country to negotiate a succession of donor-assisted structural adjustment programs that were implemented during the 1980s. These have promoted privatization of parastatals, removal of subsidies, retrenchment in the public sector, and diversification of the agriculture-based economy. The cornerstone of the latter policy, enshrined in the New Agricultural Policy of 1984 and the Cereals Plan of 1986, has been a reorientation of the Government of Senegal (GOS) policy away from supporting groundnut production to a goal of reaching 80 percent food security by the year 2000 (Fall 1990). This entails raising domestic cereal production (currently securing only 60 percent of needs) and reducing imports (Fall 1990).

Employment Situation

These adjustment policies, rigorously followed, have resulted in declining real incomes for most Senegalese, particularly those in urban areas, who account for 40 percent of the population (EIU 1990). In the cities, unemployment is a serious problem. In 1982, formal unemployment in Dakar was estimated at 20 percent (World Bank 1989d). Since then, employment conditions have worsened considerably: 30 major enterprises have closed since 1986 (shedding 4,500 workers); another 7,000 jobs are expected to be lost in the industry sector; some public sector

employment has been steadily shrinking; and, in 1989, it was announced that a further 10,000 jobs would soon be cut at the same time that 100,000 new job seekers enter the labor market each year (World Bank 1989b; EIU 1990). While the informal sector is very active—in 1988, 30,000 micro-enterprises were employing over 57,000 individuals (Lubell 1990)—72 percent of these firms are in commerce, and with declining purchasing power in urban areas (the official minimum wage has fallen steeply in real terms since 1982), such activity is not expanding.

The rural areas, by contrast, are dominated by the agricultural sector, which contributes 22 percent to GDP and employs roughly 70 percent of the population (FSO 1990). Prevailing pessimism about agriculture's future in Senegal has led GOS to encourage diversification away from agriculture in general, and from groundnuts in particular (Lele 1989). So far, however, this search has borne limited fruit. The 1986 Plan Cerealier's proposition that domestic cereals supplant groundnut cultivation has had little response, given households' needs for a cash income as well as food. Costly irrigation investments in the Fleuve region, designed to raise rice self-sufficiency, may raise rice production, but without massive interregional migration, the employment effects of such investments appear to be limited, since only 9 percent of the total population inhabits this region (Lele 1989).

Potentials for Public Works Programs

At independence, Senegal had one of the most developed road infrastructures in Africa. This has been instrumental in supporting the country's groundnut export sector during the past 30 years. While still in a relatively better condition than networks in neighboring countries, underinvestment in maintenance has led to a deterioration of the existing stock (EIU 1990). Since 1970, the World Bank has invested U.S. $91 million in roads in an attempt to improve the stock. However, only U.S. $6.6 million of this was allocated to feeder roads (World Bank 1989b). Similarly, the EEC has allocated only 33 percent of its ECU $18 million infrastructure funding since 1980 to rural roads (EEC 1989). In both cases, most construction was based on capital-intensive technology, thereby missing the opportunity for public works programs. However, the opportunity remains since GOS has allocated 29 percent of its 1990/91 public investment to the transport sector (the highest single proportion), and an expansion of the feeder road system is needed to assist future agricultural intensification and commercialization.

Experience with Public Works Programs

In order to soften the impact of structural adjustment, GOS has taken several steps to encourage employment creation:

- From 1982 to 1986, GOS provided a fund to support unemployed graduates in establishing private firms.
- In 1985, a Special Reinsertion Fund of U.S. $1.6 million was set up to support private initiatives of laid-off public servants and unemployed graduates (Lubell 1990). By 1990, 2,600 people had been funded.
- In 1987, the Special Reinsertion Fund came under the control of the 'Delegation a l'Insertion, a la Reinsertion et a l'Emploi,' which was created to manage GOS' broader commitment to employment creation through labor-intensive public works programs (World Bank 1989d).
- In 1989, an emergency employment program was launched, costing U.S. $50 million, with the aim of creating up to 70,000 jobs over three years.

The flagship project of the latter emergency employment program is the AGETIP public works project. Supported by the World Bank and WFP, AGETIP is currently implementing 57 projects, most costing less than U.S. $0.25 million, and all committed to ensuring that 33 percent of the total cost represents labor costs (World Bank 1989b). AGETIP is, in effect, a commercially-managed parastatal—a clearing agency that matches donor and GOS funds with private firms, while ensuring that all activities are labor-intensive. An estimated 7,000 person-years of employment will be generated during three years (World Bank 1989b).

Most projects involve minor building activities, garbage disposal, road desanding, and drain-clearing works in urban centers. The drain-clearing and garbage disposal projects, for instance, are expected to generate 2.7 million workdays over 18 months of operation. Work is to be effected by labor gangs of up to 20 workers operating under a supervisor, male or female—it is not unusual to find 19 men under the supervision of a woman.

Payment was originally in food, but during the rainy season, labor availability dried up because the food was apparently not sufficiently attractive and, therefore, the project started to add U.S. $1.5 per day

to the food ration. There is now an excess of labor, such that at the project site of St. Louis, for instance, jobs are rationed so that individuals may only work for three months before they have to be replaced on the scheme by someone new.

Senegal's experiences with public works programs is summarized in Table 16.

Summary and Policy Conclusions

Four general conclusions can be drawn from various donor evaluations of past experiences with public works programs in Senegal:

1. Public works programs need to be narrowly focused, both sectorally and geographically, to ensure successful targeting and sustainability.

2. There is currently a more urgent need for urban employment creation than for rural projects, given recent good harvests and the greater decline of urban purchasing power.

3. During nonemergency years, public works programs remuneration is more appropriate as a cash wage than as a food wage. This is especially true for the urban sector: food has relatively less attraction for the urban poor than for the rural poor.

4. Private involvement in employment creation programs should be encouraged where public sector involvement is not essential for coordination of technical ministries.

These four conclusions are gaining wide acceptance amongst the donor community in Dakar. However, they are not based on a detailed analysis of the multiple issues involved. Such an analysis is urgently needed to feed into the investment prioritization process, given that public works programs are now a key item on the public agenda.

Table 16--Selected country experience with public works programs: SENEGAL

Objectives/ Functions	Years	Area Covered	Costs		Workdays Created	Output Created	Project Type[a]	Current Status	Main Donor	Donor Assessment
			External	Government						
			(U.S. $ million)		('000)					
Conservation	81-84	Country	6.5	4.1	12.0	Tree planting, erosion control	F	Ended	WFP	Positive
Conservation	85-90	Country	16.0	10.0	12,000.0	30,000 hectares tree planting, 4,500 windbreaks, 53,000 hectares forest rehabilitation	F	Ended	WFP	Negative
Irrigation	87-90	Fleuve region	6.0	?	?	6,000 hectares small irrigation, 750 hectares tree planting, 13 dams	F/V	Ongoing	WFP/ EEC	Mixed
Graduate employment	82-86	Dakar	2.0	17.1	2,000 jobs	Commerce and transport firms	S	Ended	GOS/ AfDB	Mixed
Urban infrastructure	89-93	Dakar (6 pilot projects)	1.4	?	400.0	Sanitation, roads, desanding roads, minor construction	C	Ended	IBRD	Positive
Urban infrastructure	90-92	3 main cities (22 projects)	28.0	5.0	2,100.0	Roads, drains, construction	C	Ongoing	IBRD/ ADB/ WFP	Positive
Reforestation	86-91	West region (30,000 households)	10.0	2.8	?	4,000 hectares windbreaks	C/V	Ongoing	USAID	Mixed
Reforestation	88-91	Urban centers	?	?	1.0	60 kms roadside trees planted	C/V	Ended	USAID	Negative

[a] F = food wage; C = cash wage; V = voluntary participation (no wage); S = self-help (cash to support private initiatives).

CAMEROON

Food Security

Relatively wealthy by African standards, Cameroon has recently faced hard times: per capita incomes fell by 22 percent in real terms between 1985-88, reaching U.S. $907 in 1988 (World Bank 1990c; Sadik 1990). A sharp deterioration in the terms of trade, declining oil revenues, and inflation have fueled the economic downturn, resulting in negotiations being initiated for a structural adjustment loan.

Food production during this period has nevertheless kept pace with population growth in aggregate terms, providing an average of 2,200 kcals per capita per day, and contributing to a relatively high food self-sufficiency ratio of 96 percent (FSO 1987a; World Bank 1990c). However, while the aggregate picture is good, food insecurity persists in several regions. The northern provinces, for example, Sahelian in character and accounting for 27 percent of the population, suffer from recurrent droughts and locust invasions. Thus, while the national average for acute and chronic/acute child malnutrition in 1978 was 6 percent, the northern regions registered 11.4 percent (Blanford and Lynch 1990). Other pockets of malnutrition, particularly affecting women and children, are to be found across the country and are related to absolute poverty (UNICEF 1989). A 1984 national income-consumption survey indicated that while households in the wealthiest income quintile had average annual expenditures of U.S. $1,420 per capita, households in the poorest quintile spent only U.S. $122 per capita (Lynch 1990). Furthermore, 83 percent of households in the poorest income quintile were in the High Plateau and northern regions, whereas only 41 percent of the wealthiest households were in those regions (Lynch 1990).

Food Policies and Poverty Alleviation Strategies

The reaction of the Government of Cameroon (GOC) to the economic downturn and to concerns about future food production has been to cut public spending, reduce public sector employment, and reorient policies towards the rural sector. The reorientation of policy towards the rural sector also incorporates a policy shift away from capital investment in the commercial estate sector (which received 62 percent of all funding to agriculture in the 1976-80 Plan) and towards the smallholder sector. Expensive (subsidized) support for rice production in the north, and for coffee, cocoa, and cotton in the south, has been criticized as

inefficient (Lele 1989; van de Walle 1989). Indeed, Cameroon possesses great potential for growth in smallholder food production, since crop yields in most cereal crops are well below potential (due to inadequate research and extension), and only 20 percent of its available arable land is currently being cultivated (Lele 1989).

On the nutrition front, GOC has prepared a Food Security Strategy. With the goal of achieving food self-sufficiency by the year 2000, the Strategy aims for improved food productivity, reinforced marketing and distribution channels, and raised nutritional status for the entire population. The Strategy is to be implemented on a multi-sectoral basis and coordinated by a National Committee Responsible for Food and Nutrition (CONAN) which was promulgated by Presidential Decree in 1988. The committee has yet to take substantive shape.

Employment Situation

The oil-boom from 1978 to 1985 fueled rapid urbanization, such that 44 percent of the total population now inhabits urban areas, which continue to grow at 8 percent per annum (Lele 1989). Unemployment in the cities is rising rapidly: 15 parastatals and 4 state-owned banks were recently liquidated, 12 more parastatals were privatized (with considerable employment retrenchment), and 38 have been restructured (Cameroon 1989; World Bank 1990c).

However, donors and GOC are not yet overly concerned with the situation. The few steps currently considered by GOC to soften the social impact of structural adjustment are: a) support of ex-public servants in finding new employment; b) promotion of initiatives in the private sector that would help relaunch economic growth and thereby provide jobs; c) provision of technical and financial support to a program for the creation of micro-enterprises; and, d) the reinsertion of young people into the agricultural sector (Marches Tropicaux et Méditerranéens 1988; Cameroon 1989). In rural areas, 92 percent of the population is engaged in agriculture and related activities, but considerable tracts of land remain untouched (FAO, Food Policy and Nutrition Division 1989). The President therefore recently renewed a call, first outlined in the 6th Five-Year Plan, for a "return to the land" (CTA 1990). Whether this will be heeded, given current constraints to smallholder commercialization, remains to be seen.

Potentials for Public Works Programs

Until recently, the responsibility for construction and maintenance of feeder roads lay with parastatals, and they have been slow in serving the lower-potential, smallholder-dominated regions (Lele 1989). Currently, there are only 33,000 kms of roads in the country, of which a mere 3,500 kms are bituminized (Cameroon 1989). Inadequate marketing outlets and transportation bottlenecks have been widely recognized as constraints to sustained agricultural growth (UNICEF 1989). Consequently, both the 6th Five-Year Plan (1986-91) and the New Economic Strategy Plan of 1989 placed high emphasis on "extending and improving the rural feeder road system" (Marches Tropicaux et Méditerranéens 1988; Cameroon 1989). Yet, neither the GOC's own investment program, nor the World Bank's forthcoming Rural Infrastructure Project are based on labor-intensive technology for road construction.

The other physical infrastructure deficiency most commonly referred to is the lack of facilities for postharvest storage and processing. At the farm level, postharvest losses of 10 to 70 percent are reported according to the location and crop considered (World Bank 1990c). As a result of this, some 60 to 75 percent of crops reserved for sale are disposed of within two months of harvest, which depresses prices and agricultural income (World Bank 1990c). A country-wide program aimed at transport (marketing) and storage infrastructure improvement could have a positive impact on food security and nutritional status.

Experience with Public Works Programs

Labor-intensive public works programs have a limited history in Cameroon, partly because the relative wealth of recent years has not raised public concern for employment generation, and partly because local traditions of communal labor activities are generally restricted to parts of the northwest region (the anglophone area). It is only in the northwest that projects based on voluntary community participation have been implemented on a large scale. For example, the EEC has supported rural development works in 15 villages near Bafut. Villages identify a project need and provide 33 percent of costs, in return for technical and financial support from the EEC. An evaluation in 1989 was positive (the project will be expanded from 1991 to involve 260,000 participants), yet it was found that the project was isolated from any GOC involvement, and that it was difficult to find mature community organizations with which to interact at a grassroots level (EEC 1989).

In other parts of the country, WFP has been the main donor supporting small rural development projects and reforestation activities. A proposal has been made for WFP to further support forestry activities managed by the National Office for Forestry Development (ONAREF). Over four years, some 3.2 million workdays would be generated in tree planting, seedling production, watershed management and training (WFP 1990). ONAREF employees would have their salaries increased in kind by five rations/day, against a salary reduction of U.S. $0.45/day (WFP 1990). Villagers would receive only food rations.

The most recent proposal for labor-intensive activities comes as part of a World Bank-led Food Security Project. At a total cost of U.S. $41 million (to be secured from multiple donors), it aims to fund 3,200 micro-projects over five years (World Bank 1990c). Most projects will be directly productive, such as irrigation schemes, micro-dams, and cattle-dips. Up to 50 percent of total costs will be administered for the project by local organizations (NGOs or other agencies), while participants will meet the remainder in cash or in kind. In the northern regions, cereal store projects will be supported by WFP which will advance 50 percent of initial stock. Intricacies of project organization and management, as well as full donor-funding sources, have yet to be resolved. Cameroon's experiences with selected public works programs are presented in Table 17.

Summary and Policy Conclusions

While food security has recently become a GOC issue, employment creation is not yet on the agenda. Most line ministries and donor agencies currently seek the swiftest technical solution to asset creation, with little or no concern about the labor-intensity of operations. Indeed, projects relying on smallholder participation for the implementation of structural projects are a relatively new development. Concern with trends in the labor market and the need for employment creation, both in urban areas and in the northern provinces, may rise in the near future as structural adjustment takes hold. However, GOC perception of a need for a large public works program in the near future is currently low.

Table 17--Selected country experience with public works programs: CAMEROON

Objectives/ Functions	Years	Area Covered	Costs		Workdays Created	Output Created	Project Type[a]	Current Status	Main Donor	Donor Assessment
			External	Government						
			(U.S. $ million)		('000)					
Rural development	73-78	Country	8.0	?	?	Schools, clinics, training	F	Ended	WFP	Positive
Rural development	79-89	Country	33.8	?	?	Reforestation, cereal banks	F/V	Ended	WFP	Mixed
Rural development	81-88	Northwest (15 villages)	2.8	?	?	29 kms roads, 10 bridges, 8 schools, 5 clinics	V/S	Ongoing	EEC/ France	Positive
Infrastructure	88-91	Western province	0.8	?	?	Cereal banks, mills	V/S	Ended	UNDP	Negative
Reforestation	90-94	Country	4.0	18.0	3,200.0	7,250 hectares trees, 88,000 hectares erosion control, training	F/V	Planned	WFP	...
Rural development	91-96	Country	11.6	?	?	Cereal stores, irrigation, trees, mills	S	Planned	IBRD/ Japan	...

[a] F = food wage; V = voluntary participation (no wage); S = self-help (cash to support private initiatives).

SUDAN

Food Security

Growth in the Sudanese economy, which had shown rapid expansion in the early 1970s, started to taper off in the late 1970s. The 1980s witnessed low levels of economic growth and a marked increase in its variability. The agricultural sector, which absorbs more than three-fourths of the labor force, experienced the largest decline in growth between 1982-84, mainly attributable to three consecutive years of severe drought. The poor performance of the primary sector has given way to a rapid mushrooming of the service sector—a principal source of informal employment in urban areas.

An expenditure-based measure of income distribution shows that there was a marked increase in income disparity in the 1970s (ILO 1987a) largely in rural areas, but with significant variations across regions. Relative income positions worsened in the aftermath of the 1984-85 famine, especially in the resource-poor and drought-prone regions of the west and east, where agricultural households experienced a large drop in agricultural production and income, accompanied by a widespread decline in purchasing power, deterioration in the asset base, large nonseasonal out-migration, and worsened nutritional status. Famine affects socioeconomic groups differently, and the poor were particularly hard hit (Teklu, von Braun, and Zaki 1990). A drastic decline in food availability in rural areas and the related movements of people into urban areas also contributed to a deterioration of income distribution in urban areas.

Sudan faces a widespread problem of food insecurity (Maxwell 1989). Resource-poor households in rural areas and others living in marginal areas constitute the largest groups of the food-insecure. The working poor in urban areas form the third largest group, followed by nomads. Poverty is the core cause of food insecurity. Poverty has some key attributes which manifest themselves in terms of variation across location (a large proportion of the poor are located in rural areas), across regions (a great concentration of the poor are found in marginal, drought-prone, agricultural areas where income levels are low and variable and asset bases are too thin to shield from income variation), over seasons (income flows are strongly linked to seasonal flows of agricultural production), and among demographic groups (the poor are prevalent among asset/labor-poor female-headed households).

In addition, poverty manifests itself in terms of the prevalence of child malnutrition. A recent nationwide nutrition survey (Sudan, Ministry of Health and Social Welfare 1986) indicated a prevalence of child malnutrition in North Sudan: 35 percent of children under five were stunted, 42 percent were underweight, and 15 percent were wasted. The prevalence of malnutrition was higher in rural areas, particularly among the nomads, but levels were also high in urban areas. Large regional and seasonal variations were observed. The sizable malnutrition was related to poor consumption (low level as well as frequency) and the health environment.

Employment Situation

Growing at an annual rate of 2.8 percent between 1955-83, the population of Sudan was recorded at 21.6 million in the 1983 census. Projections after 1983 assume an increased growth rate of 3.1 percent. 51.2 percent of the 1983 population was of working age, between 15 and 65 years. Of these, 67 percent, or 7.4 million, were in the labor force. Men constituted about 70 percent of the labor force.

The bulk of the labor force is engaged in agriculture. Except for those engaged in irrigated tenancies (13 percent), the rest of the agricultural labor force were own account farmers and pastoralists (Modawi, Soluman, and Ahmed 1987). Although there is no evidence to suggest an overall shortage of labor in rural Sudan, labor shortages do appear in some regions during the peak agricultural season. Moreover, there are sizable variations in net labor availability across regions; a factor that helps explain a great deal of the internal mobility of labor in the country.

The government and public corporations are the major employers in urban areas (ILO 1987a). In 1983, for example, they employed 42.6 percent of the urban labor force. Public sector employment accounts for not less than 80 percent of total wage employment. A 1986 urban survey by the Ministry of Labor shows that the formal private sector absorbed 8.4 percent of the urban labor force. The informal sector absorbed a significant share of the urban labor force—close to 40 percent. Open urban unemployment was estimated to be around 13 percent in the early 1980s. The problem of unemployment probably worsened in the 1980s as the economy experienced the impact of the 1984-85 famine and the adjustment programs.

Experience with Public Works Programs

An UNDP/ILO-initiated labor-based public works program came into operation on a trial basis in mid-1984. The pilot program in northwest White Nile Province integrates pump irrigation, rural feeder roads, afforestation, and village-level social/community infrastructure projects (water supply, schools, health centers, and veterinary centers). The program aims to improve the productive capacity of the project area and enhance employment and income opportunities for low-income segments of the population.

Program administration is the responsibility of the Ministry of Labor and Social Security. Within the Ministry, the National Coordination Office is responsible for program implementation. The national coordinator is a member of the Provincial Technical Committee, which is responsible for the selection, approval, implementation, and supervision of projects. Village committees, serving as the base institutional organs for identification and management of projects, act as a link between the technical committee and the target population.

The projects generated total wage employment of 302,530 man-days during 1984-88 (note that the 1988 figure covers only the first six months). An additional 12.2 percent of the total employment was generated through communal self-help arrangements. Despite a substantial number of households being headed by women, the share of women in total employment was less than one percent.

Wages were paid in a combination of food and cash—the usual practice being to pay two-thirds in cash and one-third in food. WFP, one of the donors, contributed food as partial payment for wage. The wage rate was linked to a task measure of output. The share of wages paid varied widely among projects from 76 percent in irrigation and 67 percent in forestry to 41 percent in water supply, 32 percent in other community projects, and 19 percent in road construction. However, labor inputs in the production of materials for the projects and the value of voluntary labor, important in highly popular community projects, is not taken into account.

A high rate of success was achieved with respect to the physical output of social/community projects (ILO 1988b). These projects had a direct and immediate output and, hence, popular support was strong. Irrigation and road projects, on the other hand, were behind schedule due to lack of sufficient funding and coordination with regional irrigation and roads authorities. These projects were rescued in

November 1988 when the United Nations Capital Development Fund (UNCDF) agreed to provide funding for completion of the construction work.

Beginning in 1988, the program moved to a second trial phase for three years. In addition, similar programs were started in North Darfur (El Fasher and Um Keddada rural councils) and North Kordofan (El Obeid district council), except that road and irrigation projects were substituted by water harvesting projects.

These programs attempt to build on the experience gained in the pilot phase of the White Nile program:

- They emphasize the need for tapping local institutions and the tradition of community self help in identifying projects, provision of labor, finance and materials, and maintenance of projects. The programs call for strengthening these institutions through training and improved technical assistance.

- They attempt to correct deficiencies of the pilot program, such as starting irrigation and road projects without securing sufficient funds (hence, the projects stalled before completion), and not sufficiently involving the technical/operation government agencies in the initiation and design of projects (hence, the projects lacked technical support and supervision). Second-phase projects are not put into operation unless they secure required funds and develop working relations with technical/operational ministries.

- There is a call for more involvement of women; an income generation scheme targeted at women has been activated.

Nonetheless, concerns are still expressed on the design and operation of these programs.

- It is not clear to what extent "economic efficiency" guides choice of project within the framework of an integrated approach. Given the thin managerial and financial capacities of the program, consideration of cost must play an important role.

- There is an expressed caution over possible labor shortages whenever two or more projects are simultaneously implemented

in the same area. It is even worse when program activities compete with seasonal agricultural work.

- The linkage of the wage rate to the local labor market must remain flexible to reflect changing market conditions, especially seasonal variations in wage rates.

- There is a need to define the current function of food: is it a remuneration or an incentive within the wage structure?

Summary and Policy Implications

The problem of acute food shortages remains a major concern for many Sudanese households. The burden of preventing hunger falls heavily on low-income households in an economy that experiences low growth accompanied by deterioration in income distribution. The poor have few degrees of freedom with budget reallocation since food budget shares are already high and the scope for maintaining food consumption levels by shifting from the nonfood budget is limited.

Public policy must address the key components of the poverty-hunger relationship in order to deal with the problem of access to food. Central to this is the need to improve productivity in rainfed agriculture, given that the problem of access to food is linked to low and variable returns to labor. In addition, the drive for the enhanced income and productivity must be supplemented by programs to stabilize income fluctuations, particularly in drought-prone areas. Public works programs can occupy a central position in such income-support measures.

ETHIOPIA

Food Security

The food insecurity problems of Ethiopia, the poorest country in the world (GNP per capita of only U.S. $110 in 1989), are well known. Famines have occurred throughout the country's history, and in the last 20 years alone, four severe food crises have taken place. Such crises are generally concentrated in the structurally food-deficit regions of the north, east, and south. However, during the nationwide famines of 1973/74 and 1984/85, few parts of the country were spared the price increases, social dislocation, and asset-stripping characteristic of acute food distress. Indeed, there has been no year during the 1980s in which less than 2 million people were officially classified as "in need of assistance" (Webb, von Braun, and Yohannes 1991).

The immediate future is not promising. Current national food consumption is estimated at only 1,570 kcals per capita per day, yet cereal production per capita has been declining steadily since the 1960s, at an average rate of 4.1 kgs per annum (UNEPPG 1989; Webb and von Braun 1991). It has been estimated that during the 1990s, only 70 percent of national food requirements would be able to be met during even an average rainfall year (Belshaw 1990). Indeed, the 1989 and 1990 harvests were again poor in the north, east, and southwest, and more than 2.5 million people are considered to be in serious risk of starvation (FEWS Project 1990). Foreign exchange reserves and export potential are both too small to ensure that the needs gap can be met through commercial imports. As a result, a heavy reliance on food aid (which topped 1.3 million tons in 1988) is likely to continue for several years (Webb, von Braun, and Yohannes 1991).

Food Policies and Poverty Alleviation Strategies

The 1984/85 famine prompted the Government of Ethiopia (GOE) to focus its attention on improving food security. In 1986, a national workshop was convened to discuss the causes and effects of the recent famine, and to establish an effective food security strategy for the future. Recommendations from the workshop formed the basis for a draft National Food and Nutrition Strategy in 1987, which was adopted in 1989. Actions taken in this context include: the creation of a Food and Nutrition Unit within the Ministry of Planning, increases in food

producer prices, and liberalization of the grain marketing system (Belshaw 1990).

A parallel but separate process of strategy formulation provided a National Disaster Prevention and Preparedness Strategy, and a National Conservation Strategy. These strategy documents (both of which articulate a special role for public works programs in supporting agro-forestry, erosion control, and infrastructure activities) were absorbed into mainstream planning activities, including the Five-Year Plan of 1990-1995. The resulting convergence of opinion on the fundamental causes of famine and related food security needs was highlighted in 1990 by the dramatic policy reorientation announced at a session of the Central Committee of the Worker's Party. Termed a "new economic policy," a package of reforms was proposed which brought together many elements underlined in the three separate strategies previously commissioned. Key policy changes included:

- private tenure of land and trees for smallholders (in perpetuity),
- permission for smallholders to hire farm labor (which was previously outlawed),
- removal of control stations that formerly regulated the movement of grain across provincial borders,
- abolition of grain quotas,
- creation of an effective cereal buffer stock (with a transfer of responsibility for such a stock from the Relief and Rehabilitation Commission (RRC) to the Agricultural Marketing Corporation),
- permission for producer cooperatives to dissolve themselves,
- removal of constraints to private trade in manufactured goods, and,
- denationalization of uncompetitive enterprises (Belshaw 1990).

Employment Situation

Employment in the nonagricultural sector is growing, but its importance remains relatively small: between 1965 and 1985, the proportion of the labor force working in the industrial sector rose from 5 to 8 percent, and that working in the tertiary sector rose from 9 to 12.3 percent (UNDP 1990b). Yet, from 1970 to 1980, average earnings for all employees fell by 4.6 percent per annum, followed by a continued fall by 3.1 percent per annum from 1980 to 1986 (UNDP 1990b).

Consequently, agriculture remains the principal income source for 80 percent of the population, despite its low productivity and high risk (IFAD 1989). GOE investment in agriculture (the sector provides roughly 50 percent of GDP) remained steady between 1974 and 1984, at around 9 percent of total expenditure (Diakosavvas 1989). The 1984-94 Ten-Year Perspective Plan increased this commitment to 30 percent. However, this investment was not equitably distributed; on the one hand, 63 percent of the total fund for agriculture was allocated to the state farm sector (which provides only 5 percent of national food production), leaving only 37 percent for the smallholder sector (IFAD 1989). On the other hand, the bulk of the investment reaching the small-farm sector has been increasingly concentrated in the higher potential/lower risk regions. In 1986, most projects and subsidies to the smallholder sector focused on 148 "surplus-producing" districts; in 1988/89, investment was concentrated in 181 such districts; famine-prone regions receive little investment (IFAD 1989).

It is not yet clear what impact the new policy permitting open hiring of agricultural labor will have on the labor market. Hiring did previously exist in most areas despite its illegal status. Yet, the recent shift in priorities away from centralized production towards private incentive-promoted production may well increase the demand for labor in agriculture.

Potentials for Public Works Programs

Improved transport, irrigation, and social infrastructure, as well as expanded erosion control and reforestation, are all badly needed in Ethiopia. For example, an estimated 90 percent of the population still lives more than 48 hours' walk from a primary road (FAO/WFP 1989). The highest density road coverage is concentrated in the higher productivity central and western regions: Bale has a road density of 0.11 km/km^2, versus Shewa, which has 3.14 kms/km^2 (IFAD 1989).

Irrigation development is also well below potential. Less than 10,000 hectares are currently irrigated out of a potential total of 253,000 hectares (Hewett 1989). Some of the difference could be developed with appropriate technical supervision, financing, and labor. UNDP and the Food and Agriculture Organization of the United Nations (FAO) are supporting the drafting of a Water Resources Master Plan which aims, by 1991, to advise on how to develop the nation's valleys. More than 200 potential dam/irrigation sites have already been identified in Eritrea and Tigre alone (EEC 1989b).

The need for large-scale reforestation is also widely recognized. Less than 4 percent of the country is still wooded; between 1980 and 1988, an average of 88,000 hectares was deforested per year (UNDP 1990b). This deforestation results in heavy soil losses and increasing problems of fuelwood availability. High tree survival rates (up to 85 percent) indicate that large-scale planting exercises through public works programs hold high potential for success, especially given GOE's new policy that accords private tenure of trees on smallholder farms (EEC 1989b; CRDA 1989).

Experience with Public Works Programs

Public works programs have been widely used in Ethiopia since the early 1960s. Most started out as relief and rehabilitation activities, some of which have evolved into longer-term development projects. A national workshop on FFW, held in 1986, concluded that public works should play a major role in assuring both short-term hunger alleviation and longer-term resource conservation (ONCCP 1986).

The most important single player in this field, WFP, has been supporting FFW activities since 1975. Its current program, which involves 250,000 tons of food inputs with U.S. $76.1 million, is the largest such operation in Africa. Implemented through the Ministry of Agriculture, it aims to rehabilitate 2.6 million hectares of degraded land in nine provinces (FAO/WFP 1989). The project provides 27 million workdays per year through activities including reforestation (41 percent of total activities), soil conservation (39 percent), and feeder road construction (14 percent) (FAO/WFP 1989). A standard ration of 3 kgs of cereal is paid to participating households, whose selection varies according to location and type of activity.

Seeking a different approach to public works programs, the Cash-For-Food Program (CFF) was implemented by the United Nations Children's

Fund (UNICEF) and RRC between 1983 and 1989. In return for "voluntary" community labor on irrigation works, roads, and reforestation, UNICEF distributed a monthly cash income to 19,000 households in "pocket drought zones" distributed across seven regions. This approach assumed that the income would stimulate a flow of food from surplus districts which could then be purchased in local markets (UNICEF 1988). It was believed that cash distribution would be cheaper and less disruptive to local markets than food wages.

Several evaluations conclude that CFF did work well, and at half the cost of delivering FFW to the same sites (Kumar 1985; UNICEF 1988). However, these evaluations have some drawbacks:

- they are partial financial calculations, not full economic analyses,
- they overlook transfers to cash recipients because of problems in gaining access to food at some markets, and,
- they do not consider the sustainability of assets generated: in two cases, the irrigation schemes established were no longer functional by 1989 (Webb 1989).

On a much smaller scale, many NGOs and church organizations also execute public works in Ethiopia. In 1989, 75 such FFW projects were identified (FAO/WFP 1989). For example, Lutheran World Federation started food relief distribution in 1985, and turned this activity into an FFW project once the immediate danger of high mortality had receded. Main activities were road building (41 percent), followed by erosion control (26 percent), water developments (20 percent), and afforestation (12 percent) (Erni 1988). Almost 5 million workdays were provided over four years, at a cost of U.S. $6.5 million (Erni 1988).

Evaluations of this project are very favorable, and assets created continue to be maintained because of good community participation in project design. The roads opened access to regional markets for remote villages with visible multiplier effects: for example, since the road reached a village called Dinki, two large water mills have been built, spinning and weaving activities have flourished in response to marketing opportunities, and food security has much improved.

Summary and Policy Conclusions

Ethiopia continues to need public works, both of a long-term nature (providing badly needed infrastructure, reforestation, and erosion control), and of a shorter-term emergency relief nature.[10] In certain circumstances, there is a confusion over primary objectives. Nevertheless, project evaluations have generally been satisfactory, some recording favorable economic rates of return of 15 to 18 percent (EEC 1989b; FAO/WFP 1989). Questions of post-project asset deterioration because of insufficient maintenance and poor technical standards (due to a lack of trained local staff, poor coordination between active ministries, and inadequate project monitoring and evaluation) continue to concern planners (EEC 1989b). These technical and managerial constraints must be overcome for improved project performance and guaranteed long-term benefits.

[10] Table 18 summarizes Ethiopia's experiences with selected public works programs.

Table 18--Selected country experience with public works programs: ETHIOPIA

Objectives/ Functions	Years	Area Covered	Costs		Workdays Created	Output Created	Project Type[a]	Current Status	Main Donor	Donor Assessment
			External	Government						
			(U.S. $ million)		('000)					
Conservation	71-74	Tigre province	?	?	300	Erosion control, waterworks, reforestation	F/C	Ended	IBRD	Mixed
Conservation	80-87	Country	154.6	?	?	Erosion control, reforestation	F/V	Ended	WFP/ Australia	Mixed
Reforestation	83-88	Eritrea, Tigre provinces	16.8	?	20,000	254,000 kms terracing, 163 micro-dams, 821 kms roads, 232 million trees	F	Ongoing	EEC/ WFP/ Finland	Positive
Irrigation	85-87	Drought zones (14 provinces)	5.5	?	?	770,000 trees, 1,065 kms bunds, 464 kms roads, 12 kms irrigation	C/V	Ended	UNICEF	Positive
Conservation, roads, forestation	85-88	North Shewa province	6.5	...	4,708	250 kms roads, 13 million trees, 2,500 kms terracing	F	Ended	LWF/ Canada/ CARITAS	Positive
Conservation	87-90	Country	76.1	62.9	100,000	2.6 million hectares erosion control, 20,000 kms roads, irrigation, bridges	F/V	Ongoing	WFP	Mixed
Conservation	90-93	Eritrea, Tigre provinces	61.7	?	5,000	Erosion control, roads, tree planting, dams	F/C	Planned	EEC/ WFP	...

[a] F = food wage; C = cash wage; V = voluntary participation (no wage); S = self-help (cash to support private initiatives).

KENYA[11]

Food Security

A survey conducted in 1974/75 estimated that about 4 million people, 30 percent of the population, were poor in Kenya (Collier and Lal 1986). The poor were overwhelmingly located in rural areas; the incidence of urban poverty was smaller than that of rural poverty. The majority of the poor were smallholders. The same survey showed that 38.6 percent of smallholder households were food-poor (their per capita daily calorie consumption was less than 2,250 calories) (Greer and Thorbecke 1986). One quarter of these food-poor smallholders lived in Nyanza Province, with another one-fifth each in Central and Western Provinces. While less than 7 percent of the poor were living in Coast Province, the severity of poverty was greatest there.

Income distribution in rural areas is quite skewed. Very-low-income rural households obtain a high proportion of their income from off-farm sources. Furthermore, the high population growth rate is substantially reducing the availability of land on a per capita basis.

Child nutrition surveys from 1977 to 1982 found that preschooler stunting increased nationally from 24 percent to 28 percent over this period (Cornell Nutritional Surveillance Program 1984). Among the provinces, prevalence of stunting increased in Nyanza and Western Provinces and declined sharply in the Eastern Province. The Coast Province had the highest prevalence rate in 1982 and the Rift Valley and Central Provinces had the best record.

The Government of Kenya (GOK), in recognition of the problems of undernutrition and food insecurity, responded through a National Food Strategy in its Sessional Paper No. 4 of 1981 and Sessional Paper No. 1 of 1986, with food self-sufficiency as the primary goal.

Employment Situation

The Kenyan population, growing at 3.8 percent annually since 1980, exceeded 22 million in mid-1988. About 45 percent of this population is

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[11] This section benefitted greatly from contributions by Rajul Pandya-Lorch, a research analyst at IFPRI.

of working-age. Rural participation rates are higher than urban participation rates.

An estimated 1.7 million people were engaged in employment outside the small-scale agricultural sector in 1988 (Kenya, Ministry of Planning and National Development, Central Bureau of Statistics 1990). Of these, 1.3 million were in wage employment in the private and public sector, 0.04 million were self-employed and unpaid family workers, and the remaining 20 percent were employed in small-scale enterprises.

Formal sector employment has grown at 5 percent per year since 1986 (about 85,000 new jobs per year). The modern sector created half of the new jobs and small-scale enterprises generated another third. Within the modern sector, wage employment is about evenly divided between the private and public sectors. Growth in modern sector wage employment has been declining because of declining job creation in private sector agriculture and forestry subsectors (attributed to deteriorating performance in the coffee industry, mixed farming activities, and control of tree-felling) as well as in manufacturing. Building and construction, mining and quarrying, and transport and communications subsectors experienced the greatest growth. Wage employment in the public sector is similarly not growing as fast as it did earlier (although it is growing at rates higher than in the private sector) because public sector growth is being restricted by the government (Kenya, Ministry of Planning and National Development, Central Bureau of Statistics 1990).

Average nominal annual earnings in both agriculture and manufacturing virtually doubled between 1980-88 but, in real terms, they consistently declined between 1980 to 1985. It is only recently that they have recovered, although they are still substantially below the 1980 levels (calculated from Kenya, Ministry of Planning and National Development, Central Bureau of Statistics 1990).

Potentials for Public Works Programs

Rural roads in Kenya extend almost 50,000 kms, giving a density of 0.09 km/km^2 (Gaviria 1990). Densities are highest in Nyanza (0.5 km/km^2) and substantially lower in Northeast Province (0.03 km/km^2). Rail networks remain unchanged since colonial times, when railways linked the highland, cash crop region with the port of Mombasa.

Central government expenditure on roads declined steadily between 1980 and 1988, due to high import bills and budgetary squeezes of the early 1980s. At the same time "road expenditures have overemphasized development expenditures and present provisions for maintenance are found inadequate" (Gaviria 1990, 33). The government has responded to maintenance problems through its budget for FY 1989-91, which tripled in real terms the allocations for nonwage maintenance operations, mostly for trunk roads. Rural roads are, however, neglected, as most of the budget is devoted to trunk and primary roads maintenance.

A Profile of Two Major Public Works Schemes

Rural Access Roads Program (RARP).[12] This program was started in 1977 and was terminated in 1985 when it was transformed into the Minor Roads Improvement and Maintenance Program. The program's objectives were two-fold: to provide all-weather access between high-potential farming areas and market centers and to increase employment opportunities for small farmers. The mode of operation was labor-based road construction and maintenance.

Some 7,600 kms of access roads were constructed (of which over 3,600 kms were graveled), covering 26 of Kenya's 39 districts. About 72,000 person-years of employment were generated over the eight years of program duration. For instance, in 1982/83, 12,000 workers were employed, of whom 3,000 were semipermanent maintenance contract workers.

Construction cost averaged at U.S. $8,900 per kilometer. Staff wages accounted for 12 percent of total costs and casual wages accounted for 47 percent, thus giving a total labor share of 59 percent of total expenditure. The foreign exchange component was 25 percent.

Two policy measures were adopted to limit adverse effects on agricultural production: the use of migrant labor was discouraged; and, wages were kept low, so that when a labor shortage occurred, projects were postponed or abandoned.

Although targets were not fully met, the RARP contributed to improvements in rural life, employment opportunities, and district-level

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[12] This section is drawn from Gaviria (1990) and de Veen (1988).

planning capacity. The RARP also showed that labor-based methods were cheaper than equipment-based methods for road construction.

RARP's success can be attributed to:

- adequate institutional arrangements;
- district-level involvement in rural road selection and maintenance;
- a well-designed organizational structure in the district units;
- the ability of the Kenyan Government to involve and coordinate a large number of donors (aided by the strong technical support of the ILO, which organized the donor meetings as well as by the similarity of the technical packages and institutional frameworks for every district and donor);
- and the establishment of a training program.

The Rural Development Fund (RDF).[13] The RDF was started in 1975 with the objective of mobilizing local underutilized resources for rural development by providing financial and technical assistance to small development projects initiated by local self-help groups, as well as by initiating labor-intensive employment-generating rural works projects. Projects included irrigation, soil conservation, gully filling, and rural water supplies.

Numerous ministries are involved in the execution of RDF projects, which are administered at the district level. Project ideas are generated locally by the expected beneficiaries who jointly carry a project through. The project idea passes through seven committees or agencies before receiving final approval from the Ministry. For a project to qualify for RDF assistance, it must allocate at least 60 percent of its expenditures to labor.

Projects financed by District Development Grants normally require that the largest part of the total funds available are used for the purchase of project inputs, and, furthermore, that part of the project

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[13] This section is drawn from Kenya, Ministry of Planning and National Development (1990).

financing is done by the beneficiaries through self-help, cash, and materials and/or labor contributions. Projects financed under the Rural Public Works Program have, as their major expense, wages to unskilled labor.

Between 1974/75 and 1985/86, a total of 4,280 projects were funded by RDF, of which 1,990 were implemented by the Ministry of Agriculture and Livestock Development. The completion rate of all projects to that date was 71 percent.

Some implementation problems have been experienced because

- not enough effort has been put into developing project ideas into viable economic projects,
- input costs are high,
- training/demonstration elements are absent,
- skills or manpower are lacking,
- maintenance is inadequate and running costs are high, and
- supervision is poor.

TANZANIA

Macroeconomic and Policy Environment

In the decade between 1974 and 1984, the Tanzanian economy experienced uneven growth and a series of crises—severe drought in 1973-74, the first oil shock in 1974, massive villagization between 1974-76, the war with Uganda in 1978-79, and the second oil shock in 1979. Real per capita income declined markedly, particularly in agriculture and manufacturing. The economic hardships imposed by the crisis resulted in the expansion of a "second economy," which manifested itself through the proliferation of legitimate activities operating outside of government control, and illegitimate activities operating either within or outside the official system (Maliyamkono and Bagachwa 1990). The second economy equaled about 30 percent of the official economic activity by the end of the 1980s.

In response to the severe economic crisis, the Government of Tanzania (GOT) adopted stabilization and adjustment measures, beginning in 1981 with the National Economic Survival Program and followed by a Structural Adjustment Program in 1982-85. The most recent program, the Economic Recovery Program, was launched in 1986. It calls for reduction of price controls, institution of market liberalization, prudence in fiscal and monetary policy, reform in income policy, and devaluation. Signs of economic recovery are being observed: the industrial sector registered an increase in output of 4.4 percent in 1987, following seven consecutive years of decline (Tanzania Economic Trends, various years). A combination of good weather and possibly improved price incentives has resulted in bumper harvests and a substantial supply of staple grains to the official marketing channels. Current policy concerns center on sustaining the growth path and on improving the country's infrastructural base for promoting marketing capabilities.

Food Security

Malnutrition in Tanzania is thought to be sizable (Yambi, Kavishe, and Lorri 1990). As many as 35 percent of adults have a Body-Mass Index (BMI) of under 20. Women during pregnancy and lactation and children under 5 years of age are at most nutritional risk. The low nutritional outcome is attributed to low food intakes, deficient diets, poor dietary practices, inadequate women's time for food preparation and child care, and poor health and sanitation environment.

Food security concerns in Tanzania emerge at both regional and household levels. About 40 percent of the population lives in food deficit areas. Transportation of food from surplus regions is difficult and costly because of the country's poor infrastructure base. Malnutrition is concentrated among households that fail to maintain an adequate and stable access to food. Some 35 percent of the Tanzanian population, mostly poor households, especially smallholder farmers and low wage earners, is chronically food insecure (World Bank 1988b).

In spite of good harvests, preliminary indications are that households which are net purchasers of food continue to face high food prices. Improvements in production have also not been translated into improved incomes for some surplus producers because of high marketing costs or absence of food markets. Urban consumers, especially low income households in Dar es Salaam, are most affected by the structural corrections of the 1980s.

Government (GOT) concern with food security dates back to 1964, when GOT pledged self-sufficiency in food. The 1967 Arusha Declaration underlined the same goal. In 1984, a national food strategy was formulated and guidelines to promote agricultural production and self-sufficiency in basic food grains were elaborated. A national agricultural policy was adopted in 1985 where a strategy of agriculture-led growth was stressed for achieving self-sufficiency in food. Explicit policies for improving food security at the household or individual level are, however, lacking. The core concern in recent years has shifted towards alleviation of infrastructural bottlenecks for facilitating interregional food grain flows.

Employment Situation

The population has grown at an average annual rate of 2.8 percent between 1978 and 1988. The economically active population now numbers about 12 million, of which roughly 2 million (17 percent) are in wage employment (Odunga et al. 1989). The public sector is the dominant employer, accounting for 80 percent of total wage employment. Within the public sector, central government employment absorbs a large share of the employment created.

Earnings data reveal that average nominal wage is much greater than per capita income, which is reflective of GOT's minimum wage policy. While the nominal minimum wage was increased by 120 percent during 1969-75, frozen between 1975-80, and increased by 163 percent between 1980-

87, the picture was quite different in real terms, since nominal increases in minimum wage did not keep pace with prices. The purchasing power of the minimum wage declined up to 1985. Since then, although the trend is reversing, the current situation is such that one would need to spend over two-thirds of a day's wage for maize flour alone. Not surprisingly, urban wage earners require other sources of income to maintain stable expenditure levels, which partly explains the increased participation of the labor force in the informal sector.

The relative position of farmers has improved since the mid-1970s: while the nonagriculture wage fell by 71 percent between 1970-1984, farmers' real income fell by 24 percent. However, despite improvements in the relative position, the income differential in absolute terms remains high.

A Profile of Two Public Work Schemes

Core Rural Roads Rehabilitation and Maintenance Program. This program has been formulated to improve roads connecting high priority production areas. Tanzania has 82,000 kms of roads, but some of the major production regions have the lowest road densities. Moreover, the existing road network has extensively deteriorated due to lack of maintenance. The poor condition of rural roads has resulted in paralysis of economic activities and, thereby, threatens the present momentum of economic recovery.

The Government National Transport Policy calls, inter alia, for a concerted effort to restore and maintain the rural network. Phase I of this program will maintain 6,000 kms of essential roads in seven regions and rehabilitate 1,400 kms of priority agricultural roads. This will be followed by a second phase covering up to 5,000 kms of maintenance in other regions, and a further 2,000 kms of rehabilitation. The total cost is set at U.S. $16 million over five years. A key policy component embodied in the program is a promotion of labor-based construction and maintenance methods.

Labor-Intensive Public Works Program (UNDP/ILO/GOT). Launched in 1979, this program aimed at creating social and economic infrastructure as well as increasing employment and income opportunities for the rural poor. The program covers 10 irrigation, road, forestry, and housing

projects in five regions. Table 19 summarizes information on selected projects.

A large share of the program budget is, as a rule, allocated to the payment of unskilled labor: between 1980-85, for example, 45 percent of the total U.S. $8.1 million allocated covered the cost of 1.953 million workdays of unskilled labor (Tanzania, Prime Minister's Office 1986).

Planning, management, and implementation are the responsibility of an administrative unit headed by the Prime Minister's office. This unit provides guidelines to the regions; transfers funds; helps procure tools, materials, and equipment; and monitors the progress of implementation.

Summary and Policy Conclusions

Improvements in aggregate food supply and food markets are essential elements for enhanced food security in Tanzania. However, policies to improve income generation and distribution are also fundamental for the improvement of food security at the household level. Interventions to enhance productivity of agricultural labor, coupled with improvement of the nation's infrastructural base, are key ingredients in the strategy for improving food security. The existing underutilized labor force should play a central role.

Table 19--Project profile of labor-intensive public works projects (UNDP/ILO): TANZANIA

Project	Year Begun	Location	Project Objective	Primary Output	Employment Generated by Year	Total Cost by Year	Share of Unskilled Labor Cost	Current Status	External Funding Source
					(man-days)	($ million)	(percent)		
Mto Wa Mbu	1980	Mto Wa Mbu Settlement Area	Flood prevention, land reclamation (500 ha), irrigation (2,500 ha)		1980-85 541,246 (71,835)[a] 1986 11,552 1987 18,186 1988 4,007 1989 6,323	1.51	64.2	Ended (1990)	Netherlands
Hanang irrigation	1983		Rehabilitation of irrigation system (500 ha)		1983-85 52,492 (6,447)[a]	0.14	56.8	Ongoing	Netherlands /UNDP
Small-scale irrigation[b]	1980	Six sub-projects in Kondoa and Mpwapwa districts	Expansion of irrigation system	Construction work completed in four areas including the largest sub-project in Malolo	1980-85 139,772 (4,887)[a]	0.57	49.3	Ongoing	Netherlands
Feeder roads[b]	1980	Songea, Mbinga, and Tunduru districts	Improvement of feeder roads to all-weather condition (1,200 kms)	1980-88: 986.2 kms	1980-85 780,256 1986 86,996 1987 94,396 1988 60,566 1989 48,862		41.5	Ongoing	DANIDA
Bereko afforestation	1986	Ten villages in Northern Kondoa district	Erosion control: forest plantation (710 ha); individual planting (197 ha)		1986-89 46,454 (8,666)[a] 1989-90 28,103		48.8	Ongoing	Netherlands
Rural afforestation	1981	Ten villages in Songea, Mbinga, and Tunduru districts	Erosion control (660 ha)	1981-85: 588 ha	1981-85 103,322 1987-89		54.3 40.0	Ended (1990)	DANIDA
Water supply Phase I	1978		Piped water supply		1980-85 92,177 (10,658)[a] 1986 6,247 (340)[a] 1987 8,061 (4,242)[a] 1989 5,349 (950)[a] 1990 1,950 (1,502)[a]		19.9 29.9 40.0 57.4	Ended (1989)	Netherlands /UNDP

[a] Unpaid voluntary labor.

[b] Potential research report.

RWANDA

Food Security

Since the early 1980s, the Government of Rwanda (GOR) has espoused principles of food self-sufficiency and increased income for the rural poor (Loveridge and Weber 1988). During the first half of the decade, food production did achieve a rough balance with population growth, mainly as a result of farm area expansion into more marginal zones (Delepierre 1985). However, since 1984, limits to the expansion of arable cultivation, droughts, and declining yields have posed difficult challenges to GOR in its attempt to secure food security.

This landlocked country has one of the highest population densities in the world (280 people/km^2), and still reports an annual population growth rate of over 3.7 percent, reaching 4.2 percent in the north (FSO 1987b; von Braun and Wiegand-Jahn 1991). Demographic pressures have combined with declining soil fertility and a lack of seeds and fertilizers to create food problems in many parts of the country. In 1983, a national survey found that 40 percent of rural households were consuming less than 2,100 kcals per capita per day, with the deficiencies concentrated in the southwest and south central regions (Loveridge and Weber 1988). By 1987, daily consumption stood at only 1,919 kcals per capita per day for the country as a whole (FSO 1987b).

From 1988 onwards, conditions grew substantially worse. In 1988, southern regions experienced severe drought, while those in the north suffered floods and destructive hailstorms. In 1989, irregular rainfall and pest infestations in the bean, sorghum, and manioc crops led to serious food shortages in the southern and central regions (Rwanda, Ministry of Agriculture, Livestock, and Forests 1990). A survey of 800 preschoolers in the southwest in late 1989 found a prevalence level of 30.3 percent moderate malnutrition and 17.5 percent severe malnutrition (Desmoulins 1990). Mass migration, market price increases, and famine deaths were reported (Twizeyimana and Uwimana 1989). In November 1989, it was estimated that 640,000 people were facing hunger, with 60,000 seriously at risk of starvation (Lowdermilk 1990).

GOR issued an international appeal for food assistance in December 1989. During 1990, over 13,000 tons of cereals and legumes arrived in response to the appeal. However, food production in 1990 was poor, estimated at 5 percent below that of 1989 (Lowdermilk 1990). It is

widely acknowledged, therefore, that at the end of 1990, the south is experiencing serious famine conditions.

Food Policies and Poverty Alleviation Strategies

GOR's response to declining agricultural productivity has been to promote agricultural diversification and commercialization, as well as diversification of employment out of agriculture (Rwanda, Ministry of Agriculture, Livestock, and Forests 1990). Following the droughts and food shortages of the 1970s and 1980s, GOR has promoted the cultivation of manioc, sweet potato, and other non-cereals that are less susceptible to drought. This prompted large harvests of tubers in 1986 and 1987, with the unfortunate corollary that prices fell sharply (Rwanda, Ministry of Agriculture, Livestock, and Forests 1990). Thus, by 1988 and 1989, when hunger-reserve crops were again in demand, tuber production had already declined because of low prices. In response to this outcome, GOR launched a renewed campaign in 1989 to promote intensive production of manioc and sweet potatoes, as well as the cultivation of wheat, rice, and vegetables (the latter two crops under irrigation) (Rwanda, Ministry of Agriculture, Livestock, and Forests 1990).

Employment Situation

In concert with moves aimed at agricultural diversification, there have also been calls for more support for employment creation outside of the agricultural sector. Currently, more than 95 percent of the population is classified as rural, and most of this population is engaged in agriculture or related activities (Rwanda, Ministry of Agriculture, Livestock, and Forests 1990). However, 57.6 percent of farms operate on less than 1 hectare of land, and the contribution of agriculture to GDP has fallen from 75 percent in 1965 to only 45 percent in 1985 (Rwanda, Ministry of Agriculture, Livestock, and Forests 1990). As a result, off-farm income represents almost 60 percent of total income in areas such as the northwest, where off-farm income is mainly derived from wage earnings (37 percent), self-employment in trade and craft industries (38 percent), and remittances (25 percent) (von Braun and Wiegand-Jahn 1990).

Participation in off-farm employment fluctuates widely within and between years, as well as by gender. A survey in the northwest region found that in 1985, project-related development activities (such as the

government's road building program and donor-supported reforestation works) provided 32 percent of total off-farm employment (von Braun, de Haen, and Blanken 1991). Tea and coffee plantations and factories provided another 20 to 30 percent of income-earning opportunities. The survey also found that women, who provide 70 percent of labor inputs to agriculture, are generally less involved in the nonfarm sector than are men, although their activities do respond to seasonal and interannual fluctuations in labor demand at the tea factories (von Braun, de Haen, and Blanken 1991). Salaried, daily farm labor appears to be of minor importance.

General plans to promote employment diversification in these predominantly rural areas include support for small- and medium-scale enterprises, a focus of rural investment on "growth poles," better training in technical skills, and legislation to halt land fragmentation (Rwanda, Ministry of Agriculture, Livestock, and Forests 1990).

Potentials for Labor-Intensive Public Works Programs

The provision of transport infrastructure holds a key place within GOR policies; only food security and income enhancement represent higher immediate objectives (Guichaoua 1987). Investment in improved rural road systems has, therefore, been heavy throughout the 1980s, especially where routes connecting regional urban market centers are concerned (Loveridge and Weber 1988). From 1981 to 1985, national expenditure on road building and maintenance almost doubled, and represented 17 percent of total capital investments during the 1982-86 investment plan (WFP 1985). Nevertheless, rural transportation through mountainous regions remains a serious bottleneck to both increased market integration and rapid crisis response. Although the classified road network is relatively good in coverage (in terms of density), most feeder roads (gravel and dirt) are of a very low standard, which substantially increases transport costs.

Other recognized GOR priorities include reforestation and erosion-control activities. In 1987, it was publically announced that "the entire country must be protected from erosion" (Guichaoua 1990). Some 6 percent of the country (140,000 hectares) retains its primary cover, and roughly 60,000 hectares of communal and private land contain wood lots and plantations. However, despite large reforestation projects funded during the 1980s by the World Bank (13,000 hectares), and by Switzerland (11,000 hectares), the country continues to have difficulty meeting its fuelwood needs as well as its desire to halt rapidly

increasing land degradation. Very high tree survival rates (90 percent), documented by ILO as part of its public works activities, point to the potential for further increases in reforestation activities (Gaude et al. 1987).

Experience with Public Works Programs

In 1974, Rwanda initiated an indigenous program of labor-intensive works, grounded in the principle of "community participation in development activities." This system, called *Umuganda*, was originally designed to promote a return to traditional values of social cohesion through communal activities, which, at the same time, help create infrastructure and assets required for community development (Guichaoua 1990). It was implemented as an obligatory half-day of work per week for all adults, regardless of age, sex, or status. The work was remunerated only where salaried workers were concerned—rural inhabitants and the self-employed received no payment.

In 1984, responsibility for *Umuganda* works passed from the Ministry of Planning to the Ministry of the Interior. This was accompanied by a rethinking of objectives, which led to a more "needs"-oriented approach, with relatively less emphasis on the political nature of obligatory participation (Guichaoua 1990). All adults continue to be required to provide their half-day of labor per week, but the activities identified are intended to be more in line with community perceptions, and are increasingly implemented with technical collaboration from NGOs, church, and donor organizations. The activities include road building, water harvesting, erosion control, reforestation, construction of schools and clinics, and the cultivation of communal farms. For example, GOR's national program of road improvement and maintenance (supported by WFP, World Bank, and other donors) is implemented by the Ministry of Public Works and Energy, mainly on a salaried basis (sometimes part cash/part food), but with *Umuganda* components contributing to the maintenance of roads created.

An unpaid public works obligation for everyone acts like a progressive tax—given workers' opportunity cost of time. Enforcement of the *Umuganda* work obligation may, however, not be uniform across income groups. Few empirical data exist to document the actual distributional effects of this national 'tax' on labor, nor the viability and sustainability of structures created.

In addition to these community-based activities, Rwanda also has a long experience with donor-funded public works programs. Like Burkina Faso, Rwanda constituted one of ILO's case-study countries for the Special Public Works Program. From 1980 to 1987, the Ministry of Planning (and subsequently the Ministry of the Interior) coordinated other line ministries in the implementation of reforestation, road construction, and anti-erosion projects, with technical assistance provided by ILO. Some problems were experienced due to a lack of local capacity to manage dispersed and isolated sites, as well as due to overhasty project identification (Gaude et al. 1987). However, the final results were deemed to be more than satisfactory, with high tree survival rates leading to a 10 percent financial internal rate of return and a 22 percent economic internal rate of return (Gaude et al. 1987).

Various NGOs are also active in the public works field. For example, CARE (in collaboration with the United Nations High Commission for Refugees (UNHCR) and the United States Agency for International Development (USAID)), instituted an FFW project in 1985, designed to promote fuelwood production through community plantations. It was originally planned that the bulk of the labor would be provided by Mozambican refugees, organized by UNHCR. However, uncertainty about the longer-term sustainability of the project led to a replacement of refugee labor with local village labor (Helin 1990).

Summary and Policy Conclusions

ILO and WFP projects have been found to be very successful (both in terms of employment creation and in asset sustainability) as well as economically viable. For example, a recent cost comparison between the ILO program (which was 85 percent labor-intensive) and the World Bank-supported Sixth Road Program (an equipment-intensive project) shows that the labor-intensive public works program

- was 30 percent cheaper (per km of road) than the equipment-intensive approach;
- required one-third less foreign exchange expenditure on imported materials, while spending 50 percent more on locally-available materials;
- created 240 percent more employment and, consequently, spent more than twice as much on salaries than did the equipment-based project (Martens 1990).

The potential in Rwanda for labor-intensive public works programs is extremely high on three counts: clear infrastructure requirements, a wealth of available experience (summarized in Table 20), and suitable labor market conditions. Given the high dependency of the food-insecure on off-farm employment, largely as a result of increasing land scarcity (which rules out a subsistence-based food security option for most households), the potential for public works programs for food security improvement in this setting are exceptionally good. However, for large-scale replication of past successes, considerable technical, managerial (training and coordination), and financial support will need to be found.

Table 20--Selected country experience with public works programs: RWANDA

Objectives/ functions	Years	Area Covered	Costs		Workdays Created	Output Created	Project Type[a]	Current Status	Main Donor	Donor Assessment
			External	Government						
			(U.S. $ million)		('000)					
Reforestation/ roads	80-83	West, center	3.2	?	1,335	2,342 hectares trees planted, 63 kms feeder roads	C/V	Ended	ILO	Positive
Conservation/ roads	84-87	Gitarama Prefecture	?	?	>1,500	12,000 hectares erosion control, trees, roads, waterworks	C/V	Ended	ILO/ Holland	Positive
Roads	81-85	West	?	?	?	3,850 kms roads maintained	F/C/V	Ended	WFP	Satisfactory
Roads/mineral prospecting	86-89	Country	63.0	25.1	4,100	4,500 kms roads maintained, search for gold, wolfram	F/C	Ended	WFP/ IDA/ FRG	Satisfactory
Conservation/ roads	83-85	Gikongoro Prefecture	6.2	2.5	1,632	55 hectares nurseries, 2,250 hectares tree planting, 180 hectares irrigation, roads, bridges	F/C	Ended	WFP/ FAO/ UNDP	?

F = food wage; C = cash wage; V = voluntary participation (no wage).

BOTSWANA

Mineral-Led Economic Growth

Botswana represents the fastest growing economy in sub-Saharan Africa, with an average per capita income growth of 14 percent per annum over the past two decades. Rapid growth in the mining sector, which averaged 25.3 percent annually during this period, has been pivotal in moving the economy to such a high path of economic growth (Botswana, Central Statistics Office 1986b, 1989). Only agriculture has not contributed to the rapid pace of growth.

Agriculture's position in the economy has declined; its share of GDP was a mere 3 percent by the end of the 1980s. Apart from rapid growth of the nonagricultural sectors, the low share of agriculture is attributed to an absolute decline in the sector's growth. Real per capita agricultural income dropped nearly 8 percent per annum in the 1980s. The long drought from 1982 to 1987 played a role in this downward trend.

Low (negative) and volatile agricultural income and a population growth of 3.4 percent have slowed rural growth. Seventy percent of the population is rural-based, and the bulk of the rural labor force is engaged in the agricultural sector. The high level of urbanization (30 percent) is indicative of the desire of rural labor to seek employment in the high income sectors, but the low employment-generating capacity of these sectors means that the rural population is locked to the agricultural sector.

Current policy is centered on advancing the agricultural sector, promoting employment-generating public works schemes, and encouraging the nonagricultural sectors to adopt labor-intensive production processes. Public works programs remain central in such an economy where agriculture has the least comparative advantage for taking the lead in a labor-intensive growth process.

Food Security

Botswana maintains adequate food availability at the national level. A large proportion of its food comes from commercial imports. As long as the country continues to accumulate and properly manage its

foreign exchange reserves, there is little threat to aggregate food availability.

The concern with food security, rather, is rooted in the uneven distribution of income. There is considerable income disparity among the population. According to the 1974/75 rural income survey, 40 percent of the rural population earned 12 percent of the total rural income, and 55.4 percent of the total income was claimed by 20 percent of the population (Botswana, Central Statistics Office 1976). The 1985/86 national survey indicated little change in the pattern of income distribution: the top 20 percent of the population still claimed over 50 percent of the total income (Botswana, Central Statistics Office 1988). Incomes are lower in rural than urban areas: rural households, on average, earn half the income of urban households.

Other factors that condition relative income positions are variations in the ownership of assets, cattle in particular, educational status, and gender of household head. A considerable proportion of households—47 percent in 1985/86—are headed by women in rural Botswana. The average female-headed household income, as revealed by the 1974 rural income study, was about 65 percent of that of an average male-headed household.

Chronically food-insecure households are larger in size and concentrated in rural areas. They tend to have lower and fluctuating incomes, lack access to wage employment, and possess fewer assets. Two special groups to note in this category are resource-poor female-headed households and households that reside in remote areas of the country.

The Government of Botswana (GOB) adopted a national food policy strategy in 1985 in response to three officially expressed concerns: inadequate food production, inadequate nutritional status, and continued dependency on imported food (Botswana 1985). The strategy's objectives were to promote domestic food production, attain self-sufficiency in the main staple crops of maize and sorghum, ensure a minimum acceptable diet for all citizens, and build and maintain national capacity to deal with drought and other emergencies. The government shifted its policy in 1990 from the objective of food self-sufficiency to the objective of food security at both national and household levels (Daily News 1990). Central to this policy is the creation of employment opportunities through expansion of labor intensive activities.

Employment Situation

According to the 1984 labor force survey, 63 percent of the labor force was economically active (Botswana, Central Statistics Office 1986a). Of this, about 75 percent was employed. The formal sector absorbed 40 percent of the fully employed and another 45 percent were engaged in self-employment, outside the formal wage employment structure, in traditional agriculture. The balance, 15 percent, were employed in the informal sector. Public employment accounted for 36 percent of the formal employment.

The same 1984 study estimated that 25 percent of the economically active population was unemployed. Although the unemployment rate was lower in rural areas (23.5 percent) than in urban areas (31.2 percent), 76 percent of the unemployed were rural. Underemployment was much higher in rural areas (18 percent) than urban areas (11 percent). These figures suggest that the problem of unemployment/underemployment was widespread in rural areas, especially among females, who have a higher unemployment rate (30.6 percent) than males (19.3 percent).

Average earnings in formal employment are higher than returns to agricultural self-employment: rural incomes in 1985 were half the average earnings in the formal sector. Within the formal sector, earnings vary considerably (Botswana, Central Statistics Office 1986a). Employees in mining, government, construction, and commerce are paid relatively higher than those engaged in the formal agricultural sector.

Experience with Public Works Programs

Botswana has two recent experiences with public works programs (Dréze 1989). The first is a Labor-Intensive Road Improvement and Maintenance program (LG 34), which began as a pilot project in the Central District in 1980-82 and was later expanded throughout the country (Hagen, Guthrie, and Galetshoge 1988; Solberg, Nteta, and Tessem 1990).

The main objective of LG 34 is to improve and maintain rural roads using labor-intensive methods. The technical objective is to create road capacity that is passable all year by two-wheeled vehicles. The program is coordinated at the central level by a District Roads Engineer, who is part of a technical unit in the Ministry of Local Government and Lands headquarters. Construction and maintenance works are implemented by District Council roads units. The roads are

constructed by gangs of up to 25 casual laborers under the supervision of a gang leader. A team leader is responsible for 7 kms of road maintenance. There are 4 to 5 workers under a team leader. Each worker is assigned about 1.5 kms of road for maintenance.

By 1990, the program had improved 878 kms of gravel and earth roads, and 992 kms of dirt roads. The total number of casual labor employed in the program reached 2,812 by 1989/90. Women accounted for 37 percent of the casual labor force. Labor input per km of earth roads averaged 2,205 workdays until 1987/88, 2,075 workdays in 1988/89, and 2,333 workdays in 1989/90. Labor, the major cost component, accounted for an average of 74 percent of total costs in the last two years. Workers are paid at a daily rate equivalent to 60 percent of the minimum industrial class wage rate.

The second public works experience is the Labor-Based Relief Program (LBRP), which started in 1982/83 as part of the Government Drought Relief Program. The program intended to generate employment and income for households which experienced drought-induced income shortfalls (Drèze 1989; Hay 1988; Buchanan-Smith 1990). By 1985, the program replaced 35 percent of the income lost through drought (Hay 1988). The program reached an average of 70,000 participants per year in the 1983-88 period.

Every settlement with 100 or more inhabitants was eligible to participate in the employment program. Every able-bodied person would be given work, and be paid in cash (as opposed to food-for-work) at subsistence wage rates (wage rates were kept below agricultural wage rates). Because of the apparent excess demand for employment, jobs were provided in rotation. Each participant worked, on average, 76 days per annum.

A variety of projects were implemented at the invitation of village committees. At the peak of the drought (1983/84 and 1984/85), the program improved 24,400 kms of roads and constructed 1,090 dams, 1,722 kms of drift fence and firebreaks, and 612 pit latrines (Botswana, Ministry of Local Government and Lands, various years). There were also other projects, such as construction of wells and airstrips, and soil reclamation. The program was coordinated by the Food Resources Department of the Ministry of Local Government and Lands. At the district level, there were Drought Relief Technical Officers who provided technical and managerial expertise and reported to the District Drought Relief Committees. Work organization followed the same supervisor-gang-worker modality as applied in LG 34.

Conclusion and Policy Implications

Compared to most African countries, Botswana is advanced in its use of public works programs for food security improvement (see Table 21). The merger of relief works with the infrastructure (roads) program is a further step toward combining relief with development. Botswana's experience with labor-based road programs indicates that the key to effective program output lies in proper definition of goals, integration into the national planning process, design of appropriate work organization and management, and training of medium-level manpower. Some questions remain unanswered about the impact of existing programs on rural markets and households' food security and the sustainability and cost effectiveness of assets generated.

Table 21--Profile of public works programs: BOTSWANA

Program Type	Year Begun	Location	Project Objective	Primary Output by Year		Employment Generated by Year	Cost per km[b]	Share of Labor Cost	Wage Rate	Current Status	External Funding Source
					(km)	(workdays/km)	(Pula)	(percent)	(Pula/day)		
LG34: District Improvement and Maintenance Program	1980	Country	Improve and maintain rural road infrastructure; generate employment for rural population	1980/83:	39.0[a]	1,994[a]	10,380	53	2.10	Ongoing	NORAD
				1983/84:	55.0	1,211	7,220	61	2.50		
				1984/85:	89.4	1,701	10,088	73	2.75		
				1985/86:	76.6	3,150	12,072	78	3.00		
				1986/87:	143.1	2,548	10,350	75	3.60		
				1987/88:	140.6	2,171	12,810	78	3.96		
				1988/89:	176.0	2,075	12,800	76	4.24		
				1989/90:	158.0	2,333	16,000	72	4.66		
LBRD: Labor-Based Relief (Work) Program	1982	Country	Create employment; generate public/ community assets	1982/83:		30,000[c]	93.08[d]		1.50[e]	Ended	
				1983/84:		70,000	72.08		1.75		
				1984/85:		70,000	84.77		2.00		
				1985/86:		77,000	94.46		2.00		
				1986/87:		75,000	112.64		2.25		
				1987/88:		90,000	146.89		2.50		
				1988/89:		75,000	167.60		2.75		

[a] Excluding Ghanzi and Kgalagadi.

[b] Cost per km earth road.

[c] Number of participants.

[d] Disbursement per participant.

[e] Wage rate per 6-hour day.

ZIMBABWE

Food Security

Zimbabwe poses an unusual food security paradox for the African context. On the one hand, it is self-sufficient in major food grains. Food surpluses have been common during the 1980s (drought years excepted), and the 1989/90 harvest is expected to provide 135 percent of domestic needs (SREWU 1990). This level of productivity translates into an aggregate daily per capita availability of 2,500 calories (NSCFN 1990).

On the other hand, Zimbabwe is confronted by continuing malnutrition and household food insecurity in many parts of the country. Surveys of preschool children in 1984 and 1988 found 16 percent to be wasted and 29 percent to be stunted (reaching a high of 37 percent in Matabeleland) (Zimbabwe, Central Statistical Office 1989a). What is more, by August 1990, over 1.5 million people required food aid under the government's Drought Relief Program (Zimbabwe, Ministry of Agriculture and Rural Settlement 1990).

Distribution of Poverty

The main reason for this paradox (more typical of non-African middle income countries) is that aggregate figures mask local diversity. With a per capita income of U.S. $625 in 1989, Zimbabwe is classified as a lower-middle income country (UNDP 1990a). Since independence in 1980, GDP has grown at an average annual rate of 2.7 percent. Although the trend has been erratic due to droughts (1982 to 1985, and 1987), the growth rate for 1989 of 3.5 percent still exceeds the population growth rate of 3 percent.

However, access to productive resources in the country is not evenly distributed. Commercial farmers, with farms of 2,200 hectares on average, own 40 percent of arable land, 51 percent of which is in the best regions (Zimbabwe, Central Statistical Office 1989b). By contrast, only 26 percent of smallholder farms are located in prime farming areas, and their average size is only 4 hectares. Furthermore, there is also differentiation within the small farm sector. In 1985, the top 10 percent of smallholder households earned average annual incomes of over U.S. $462 per capita (current rates), while the lowest 25 percent of households had incomes of U.S. $24 or less (Mudimu et al. 1989). Some

of this difference is explained by geographical location. Wealthier smallholders inhabit higher potential areas, in which average annual incomes in 1987 stood at U.S. $276 per capita. In the over-populated, erosion-prone areas of Matabeleland, average incomes in 1987 were only U.S. $87 (Stanning 1989).

Not surprisingly, therefore, the worst malnutrition is found in semi-arid regions. But malnutrition is not restricted to these areas alone. The most vulnerable population groups after the poor in semi-arid lands are: salaried laborers on commercial farms, households newly moved to resettlement lands (purchased by the government from white farmers), rural landless laborers, and low income urban dwellers (especially domestics). Successful agricultural growth in Zimbabwe has clearly not been sufficiently translated into expanded employment and income for the poor, thereby stimulating increased effective demand.

Food Policies and Poverty Alleviation Strategies

To combat these problems, the Government of Zimbabwe (GOZ) has maintained policies to which it had committed itself after independence: namely, to a program of poverty alleviation through 'Growth with Equity.' This policy aimed at attaining self-sufficiency in food production (with as little disruption to commercial farm output as possible), coupled with a more egalitarian access to productive resources. Policies designed to achieve these goals included: guaranteed (higher) producer prices for cereals, minimum wage legislation, a resettlement program for the landless and unsalaried, liberalization of credit facilities and access to extension and inputs, and investment in transport and social infrastructure in previously "neglected" or war-torn regions.

Recent targeted poverty alleviation programs include

- School Feeding Program: urban-oriented food supplementation for preschoolers (soya and vegetable soups). From 1989 to July 1990, 22,000 children received food. Annual budget exceeds U.S. $40,000.

- Drought Relief Program: from 1982 to 1988, an average of 1.8 million people annually received food aid to prevent starvation. This has cost GOZ a total of U.S. $80 million. In 1990 the number of recipients will reach 2 million.

- Post-Drought Rehabilitation Program: free distribution of crop packs containing hybrid seeds, fertilizers, and chemicals.

Employment Situation

Formal sector employment has grown at less than 2 percent per year since 1986 (some 10,000 jobs per year), and for the decade as a whole has increased at an average annual rate of only 0.7 percent. With over 200,000 new job-seekers entering the labor market each year, visible unemployment continues to grow rapidly (ILO 1989a; Hifab 1990). Unemployment in 1989 officially stood at 16 percent of the formal sector work force, although it has been estimated that the real figure should be closer to 31 percent (ILO 1989a). As a result, UNDP recently stated that, "unemployment is by far the most serious economic challenge facing Zimbabwe" (UNDP 1990a).

The high unemployment is officially ascribed to: a) shortage of foreign exchange, b) lack of investment in productive sectors, c) adoption of capital-intensive technology, and d) labor market policies. The latter two reasons refer to minimum wage legislation passed in 1982 aimed at improving living standards for the poor. Monthly wages in agriculture doubled between 1981 and 1987, reaching U.S. $109 in 1989. However, this legislation resulted in labor-shedding in the commercial farm and mining sectors, coupled with higher investment in labor-saving technology. Furthermore, average annual inflation has exceeded 15 percent during the decade, eroding wage gains for the salaried and raising the cost of living for the unemployed.

The government's response has been to set up a Secretariat for Population Policy and Development to design a strategy for tackling the employment problem. An important element of this strategy will be to improve the absorptive capacity of agriculture. The agricultural sector's share of formal employment has fallen from 32 percent in 1980 to 25 percent in 1989. Employment in the mining sector (also rural-based) has dropped from 7 percent in 1980 to 4.6 percent in 1989. The growth sectors have been manufacturing, construction, and distribution—all urban-based, but of insufficient scale to absorb urban unemployment. Public investment in smallholder irrigated agriculture and in rural infrastructure are therefore planned to improve the competitiveness of rural areas.

Potentials for Public Works Programs

Inadequate road and marketing infrastructure have been blamed for limiting rural development, as well as for preventing timely drought relief activities (including the 1990 operations). In 1987, there were 0.002 km of road per capita (0.05 km per km^2), of which less than 40 percent were bituminized. The highest road density is in Mashonaland, serving the capital and commercial farms, while the region least served is Matabeleland, the poorest part of the country. Railways only serve mines and commercial farms. To rectify this imbalance, GOZ allocated 85 percent of the 1986-1990 fund for road development to be spent on rural roads. Most construction is carried out using machines; however, some is implemented on a public works basis: from 1985 to 1990, over 1,000 kms of primary roads were repaired and 6,000 kms were maintained at a cost of U.S. $35 million.

A similar imbalance still exists with regard to irrigation infrastructure. Of 192,000 hectares of land irrigated in 1990, only 5 percent serves the small farm sector (FAO 1990b). However, the potential role for irrigation in coping with drought has made public investment in this sector attractive. In addition to the 1,000 hectares developed for smallholder irrigation since 1982, another 2,000 hectares are planned for development in 1990/91.

Experiences with Labor-Intensive Public Works Programs

Public works programs were initiated by GOZ in 1983 in order to coordinate and augment the drought-related FFW activities of churches and NGOs. In rural areas, people earning less than Z$ 105 per month were entitled to work on infrastructure projects in return for 20 kgs per month of maize. The sick, elderly, or infirm received food aid without needing to work. No detailed evaluations of these early projects have yet been completed. In the urban areas, Building Brigades were created in 1982. These were designed as a means of alleviating the urban housing shortage and creating employment for semi- and unskilled labor. Although, in 1984, they were employing up to 2,000 men, most Brigades were dissolved the following year because they were found to have comparatively higher labor costs than private contractors, a slow pace of work, and an inability to secure longer-term employment security.

Since 1985, public works have continued in various forms: Catholic churches promote FFW activities through the concept of *mushandira pamwe*

(working together); UNICEF funds a "Schools-For-Work" program—parents make bricks and construct a school, then UNICEF equips it and GOZ provides a teacher; in 1990, the EEC launched its Sixth Microproject program costing 6 million ECU (the largest such program in the world), for community-based projects, most of which have a high labor content; and in October 1990, the President issued a statement that FFW programs should be quickly expanded to alleviate the effects of the current drought.

The Government Public Works Program

GOZ public works programs are organized through the Ministry of Labor, Manpower Planning, and Social Welfare, and the Ministry of Local Government, Rural and Urban Development. A system of project identification and appraisal at village and district levels was initiated in 1987 once the drought FFW projects of 1983-1985 had been terminated. A total of 4,162 projects (roads, dams, reforestation, irrigation, dip tanks) was approved nationwide, for which voluntary participants were paid U.S. $1.2 per day. The cash was generally used to purchase grain from the Grain Marketing Board depots. This program was suspended in March 1988 for lack of funds. By then, only 433 projects were still incomplete. In 1989, U.S. $4 million was released to complete 56 of the unfinished projects, while another U.S. $2 million was made available for on-going drought-related FFW activities.

GOZ is currently seeking donor support to expand public works programs in drought-prone parts of Midlands Province. This project will employ 65,000 workers over 18 months on gully reclamation, reforestation, and dam and road construction. Participants will now receive U.S. $1.6 per day.

Summary and Policy Conclusions

Zimbabwe has extensive practical experience with public works programs (see Table 22), but little of this experience has been evaluated on technical or economic terms. There is a strong commitment to continuing the use of public works programs, both during emergency situations and as a long-term development tool. Given the unemployment situation and the country's infrastructural deficiencies on the one hand, but its existing food surplus and further agricultural potential on the other hand, such a tool holds much appeal.

Table 22--Selected country experience with public works programs: ZIMBABWE

Objectives/ Functions	Years	Area Covered	Costs		Workdays Created	Output Created	Project Type[a]	Current Status	Main Donor
			Donor	Government					
			(U.S. $ million)		(million days)				
Emergency relief	83-85	Drought zones	...	?	?	Roads, micro-dams	F	Ended	Government
Infrastructure development	87-88	Country (3729 projects)	...	?	?	?	C	Suspended	Government
Rural development	89-91	Country (56 projects)	...	1.0	0.3	Dams, bridges, causeways	C	Ongoing	Government
Emergency relief	89-91	Drought zones	...	2.5	?	Roads, trees, erosion control	F/C	Ongoing	Government
Rural development	91-93	Midlands Province	1.5	?	5.8	Roads, dams, irrigation, trees, dip tanks	C	Proposed	WFP/ Government

Source: Ministry of Local Government, Rural and Urban Development, 1990.

[a] F = food wage; C = cash wage.

MOZAMBIQUE

Food Security and Poverty

Mozambique has one of the lowest incomes in sub-Saharan Africa. Average per capita income in 1989 was only U.S. $130 (World Bank 1990a). Economic growth has fluctuated widely since independence in 1975. The economy, already declining in 1975, continued its downward pattern until 1976, after which there was a slight recovery until 1980. In the early 1980s, the economy took a turn for the worse: real GDP declined at 5.9 percent per annum between 1982-85. However, following the implementation of the Economic Rehabilitation Program in 1987, real GDP growth experienced an upswing, averaging 4.5 percent per annum from 1987 to 1989, and 3.1 percent in 1990 (Mozambique 1990a).

Poverty, both chronic and transitory, is widespread in Mozambique, particularly in rural areas (World Bank 1990a). An estimated 50 to 60 percent of the population is absolutely poor. About 35 to 40 percent of the poor are presumed to be in urban and peri-urban areas, and the remainder in rural areas. A substantial proportion of the population, particularly those with few assets, little remunerative employment, and large numbers of dependents, is chronically poor. Households in transitory poverty include victims of war as well as of the economic adjustment program.

Malnutrition is serious and widespread, particularly among high risk groups—infants, young children, and pregnant women (World Bank 1989). Available evidence indicates that the extent of chronic and acute malnutrition among children compares to the highest end of the range for sub-Saharan Africa. This widespread problem is attributed to absolute low levels of food intake, which, in turn, are linked to lack of adequate capacity to produce or purchase enough food, and to poor environmental and health conditions.

The Government of Mozambique (GOM) recognizes the need to deal simultaneously with the structural and transitory dimensions of poverty. It realizes that there is a risk for transitory poverty to become structural poverty if it persists too long without being addressed. The government's concerns are embodied in its current Economic and Social Rehabilitation Program (ESRP) (Mozambique 1990a). While the emphasis remains on macroeconomic reforms to establish a sound policy environment, the program focuses on poverty reduction through growth, especially through enhancing productivity and employment for the poor.

Besides employment generation, the program's key elements include restoration of basic infrastructure, improvement of basic services, and provision of safety net measures.

Employment Situation

About 70 percent of Mozambique's estimated population of 16.3 million lives in rural areas (Mozambique 1990a). About 47 percent of the population makes up the potential working force. Sixteen percent of the work force is employed in the formal sector. The rest of the work force, especially women, who constitute 65 percent of the smallholders, is largely employed in low-production smallholder agriculture.

A considerable proportion and number of the population has been dislocated by the internal war which has been plaguing the country since independence. As of 1989, displaced and severely affected people number 4.6 million, and external refugees numbered 1.2 million (World Bank 1990a). Internal refugees are concentrated around provincial capitals and towns, and are dependent on food distribution. These victims of the war represent a substantial unutilized labor force, but one that requires a major resettlement and rehabilitation effort to integrate them into productive employment.

Potential for Public Works Programs

Given the low opportunity costs of labor in an environment of extensive underemployment and unemployment, and given the widespread destruction and deterioration of basic economic and social infrastructure, the potential for employment-generating public works programs is substantial.

GOM is committed to promoting access to employment by poor households in urban and rural areas through expansion of public works programs and labor-intensive small businesses (World Bank 1990d). The programs are envisioned to be self-targeting in design, and rely heavily on the private sector to obviate GOM's financial and administrative constraints.

Programs focused on employment generation are already underway. Based on the success of ILO and UNICEF small-scale employment programs in rural road rehabilitation, GOM intends to expand the feeder road rehabilitation and maintenance program in 40 priority districts in all

10 provinces. This program envisages utilizing the experience gained from labor-based road projects of NORAD/ILO in Zambezia, UNDP/ILO in Gaza and Inhambane, and GDR in Manica Province. A review of the ILO program is quite indicative of the country's potential for public works programs in the short and medium run.

Profile of Labor-Based Rural Roads Program

Mozambique's classified road network extends over 27,000 kms. Primary roads, approximately 4,800 kms in length, connect provincial capitals. Secondary roads (8,860 kms) complement primary roads and form the main network within the provinces. Tertiary roads (12,840 kms) are basically rural roads.

An UNDP/ILO project, focusing on rehabilitation of secondary and tertiary roads in Gaza and Inhambane Provinces, started operating in July 1988. Its objectives were to demonstrate the viability of labor-based methods for developing and maintaining rural roads, and to create productive employment.

During 1988-89, the project rehabilitated and upgraded 57 kms of roads to an all-weather gravel standard in Gaza, and completed 52 kms of all-weather roads in Inhambane. The project also organized and implemented labor-based maintenance on asphalted roads (60 kms in Gaza and 60 kms in Inhambane) and gravel roads (30 kms in each province). The project employs, on average, 185 persons in Gaza and 250 persons in Inhambane and generated 300,000 man-days of employment in the two project areas during the last two years. The work force was drawn mainly from displaced persons and returnee migrants.

The unit cost of road rehabilitation amounted to 3.17 million meticals (U.S. $1 = 800 meticals) per kilometer in Gaza and 5.95 million in Inhambane. The higher cost in the latter province was due to additional earthwork and requirements for repairing pipe culverts. A breakdown of cost components shows that payments for labor accounted for 30 percent of costs in Gaza, and for 44.3 percent in Inhambane in 1989. Workers are paid on the basis of the official minimum wage rate. Food aid received from WFP is sold to workers at official wholesale prices to ensure access to food. UNDP funds the project's capital budget.

The National Directorate of Roads and Bridges (DNEP) in the Ministry of Construction and Water is responsible for the development and maintenance of roads and bridges in the country. Within the DNEP,

there is an autonomous contracting agency, operating under the guidance and supervision of DNEP on profit basis, which specializes in road development and maintenance. The provincial agencies execute the project under the technical backstopping of ILO. Labor at work site is organized in brigades. Each labor brigade is divided into three functional groups—road rehabilitation, spot improvement, and maintenance of asphalt roads.

The project operates under difficult security and logistic conditions. Travel by road is restricted. The project's international staff travel to project sites in chartered airplanes. Most of the food supplies to project staff have to be arranged from Maputo and Swaziland. The majority of the local population in project areas prefers to stay in the towns, thus resulting in high transport costs and shortage of labor.

Conclusion

Mozambique is a unique case in sub-Saharan Africa, with its enormous potential for employment-generating and asset-creating public works programs, given the need for reconstruction and rehabilitation posed by the prolonged internal war in the context of existing widespread poverty, unemployment, and underemployment. The potential for public works programs can be exploited, provided that resources, particularly manpower, are available, administrative capabilities are improved, and financial support is forthcoming.

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