



Background Papers



The Role of Input Vouchers in Pro-Poor Growth



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Background Paper Prepared for the African Fertilizer Summit

**June 9-13, 2006
Abuja, Nigeria**

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Acronyms and Abbreviations

ADMARC	Agricultural Development and Marketing Corporation
ADPs	Agricultural Development Projects
AIMS	Agricultural Input Markets
AISAM	Agricultural Inputs Suppliers Association of Malawi
CSI	Coping Strategy Index (CSI)
DAIMINA	Developing Agricultural Inputs Markets in Nigeria
DAP	Diammonium phosphate
EFDp	Emergency Fertilizer Distribution Project
FAO	Food and Agriculture Organization of the United Nations
FHH	Female-headed households
FSP	Fertilizer Support Program
GoM	Government of Malawi
HYV	High-yielding varieties
ICARDA	International Center for Agriculture Research in Dry Areas
ISFM	Integrated Soil Fertility Management
JEFAP	Joint Emergency Food Aid Program
MACO	Ministry of Agriculture and Cooperatives
MAAH	Ministry of Agriculture and Animal Husbandry
MDGs	Millennium Development Goals
MHH	Male-headed households
NGOs	Non-governmental organizations
NSPFS	National Special Program for Food Security
OPV	Open-pollinated variety
PCU	Project Coordinating Unit
SFFRFM	Small Holder Farmers Fertilizer Revolving Fund of Malawi
SPLIFA	Sustaining Productive Livelihoods Through Inputs for Assets
SSA	Sub-Saharan Africa
STAM	Seed Trade Association of Malawi
TIP	Traditional Irrigation and Environmental Development Program
Ton	Metric ton
USAID	United States Agency for International Development

The Role of Input Vouchers in Pro-Poor Growth

Executive Summary

Approximately three-quarters of the 230 million hectares of farmed land in sub-Saharan Africa is degraded and about 70 million smallholder farm families are caught in a poverty trap of declining agricultural productivity, degrading soils, food insecurity, limited market participation, and off-farm employment opportunities. An estimated 80% of these smallholder families struggle to survive below the poverty line on less than a dollar a day. A major cause is low farm productivity. Soil nutrient depletion is a significant factor in low agricultural productivity. As a result, grain yield in Africa has stagnated at 1 ton per hectare for two decades and grain imports will need to be over 60 million tons per annum by 2010. Soil nutrient depletion has reached more than 60 kg/ha in 21 countries and between 30 and 60 kg/ha in another 22 countries in SSA. The declining fertility of African soils because of nutrient mining is one of the main causes of stagnating crop yields and declining per capita food production. In the longer term it is a key source of land degradation and environmental damage.

This paper briefly reviews some of the supply- and demand-side constraints to increased fertilizer use and defines attributes of pro-poor growth. This is defined as growth that benefits the poor. Current agricultural development programs based on identified markets for value chain development benefit the smallholder participants through new technology adoption and access to remunerative markets. The paucity of evidence that these programs create a trickle-down effect to the millions of non-participatory smallholder families demands a fresh examination of how rural development can be implemented that will create opportunities for these millions to increase productivity, diversify cropping, and fully participate in markets.

Holistic development programs are required that are pro-poor. The use of input vouchers is presented as a flexible development tool for jump starting this participation for the poor. IFDC's experience with input vouchers in Malawi, Afghanistan, and Nigeria (each program with different objectives) illustrates how both smallholder farmers and small input dealers can benefit. Vouchers, however, are only "smart subsidies" and must be matched by holistic development assistance for the targeted poor. The cost and medium- to long-term horizons to reach sustainability are substantial and require that considerable analysis, objective setting, and implementation planning be performed prior to embracing this useful policy tool.

The Role of Input Vouchers in Pro-Poor Growth

1. Introduction

The Millennium Development Goals (MDGs) call for a halving of poverty by 2015. Millions of smallholder farmers throughout Africa are too poor to participate in agricultural input markets and therefore are unable to utilize productivity-enhancing modern inputs such as mineral fertilizer and improved seed varieties. With a few exceptions that prove the rule (Bremen and Debrah, 2003), there are major constraints in African agriculture that make it extremely difficult to raise productivity for these smallholder farmers. These constraints include inherent low soil fertility exacerbated by nutrient mining, high population pressure on agricultural land at relatively low population densities, thin markets, inadequate infrastructure causing high transport and transaction costs and lack of market information communication, limited irrigation, and a lack of institutional capacity and farmer knowledge. In most countries of Africa, 80% or more of the population is primarily engaged in subsistence farming with limited local market engagement. This does not reduce hunger and malnutrition. The challenge facing African leaders is how to raise incomes of the rural poor through pro-poor growth strategies.

The social as well as the economic implications of policy thrusts that are aimed at converting millions of smallholder farmers into market participants are enormous and lie at the heart of the complex agricultural development challenge in Africa. Policymakers must also determine the objective(s) of a development strategy. Is the strategy aimed at economic growth, poverty alleviation, welfare, or a given combination of all three? The complex interactions between widespread smallholder agriculture and the environmental degradation of soils and reduced biodiversity bring another dimension into the policy arena.

This paper briefly outlines the current constraints to fertilizer supply and demand in Africa with emphasis on sub-Saharan Africa (SSA), defines attributes of pro-poor growth, and proceeds to relate experiences with pro-poor input voucher strategies for fertilizer and seed aimed at poverty reduction, asset transfer, or credit facilitation. Current experiences suggest that vouchers provide a viable and useful tool for implementing pro-poor strategies but that the implementation has to be carefully designed to fit particular circumstances and policy objectives.

2. Agriculture in SSA

Approximately 900 million hectares (ha) of land in Africa is considered suitable for agricultural production, and an estimated 83% of this land has serious soil fertility or other limitations. Current farmed land is about 230 million ha, of which 75%—some 170 million ha—is degraded. Irrigated agriculture is limited to less than 5% of the total agricultural land in SSA. Within the SSA region, 70 million smallholder farm families

are caught in a poverty trap of declining agricultural productivity, degrading soils, food insecurity, and limited off-farm employment opportunities. An estimated 80% of these smallholder families struggle to survive below the poverty line on less than a dollar a day.

Nutrient depletion in African soils has led to low agricultural productivity. As a result, grain yield in Africa has stagnated at 1 ton/ha for two decades and grain imports will need to be over 60 million tons per annum by 2010. Baanante and Henao (2006) have reported that soil nutrient depletion has reached more than 60 kg/ha in 21 countries and between 30 and 60 kg/ha in another 22 countries in SSA. The declining fertility of African soils because of nutrient mining is a major cause of stagnating crop yields and declining per capita food production. In the longer term it is a key source of land degradation and environmental damage.

Sustainable land management can only be achieved through the judicious use of both organic and inorganic fertilizer materials. Integrated Soil Fertility Management (ISFM) practices in West Africa have demonstrated that when smallholder farmers utilize locally available organic matter and apply sufficient plant nutrients in the form of mineral fertilizers, threefold increases in crop yields can be obtained in a cost-effective manner with value:cost ratios above 3 and farm incomes increased by 70% (IFDC, 2004).

Demonstrating the benefit of technology such as ISFM is in itself insufficient incentive for smallholder farmers to adopt improved crop and soil management practices. There have to be markets for the increased production at adequate price levels. In addition, affordable supplies of yield-enhancing inputs—fertilizer, improved seed, crop protection chemicals, and tools—have to be available. To be able to afford these inputs, smallholder farmers need access to crop production credit, and it is often advocated that some form of subsidized price incentive is needed because of the inherent risk in agriculture and the high prices of fertilizer in SSA.

There are many circumstances in SSA where the population pressure on agriculture land is now so severe that subsistence farming without the traditional slash-and-burn farming methods, even at absolute low population densities, is insufficient to provide self-sufficiency in food production. Under these conditions, increased crop production is for self-consumption; thus, output market development has little or no immediate impact as an incentive to increase production, and a role for subsidies can be justified.

The supply of yield-enhancing inputs in SSA is restricted and highly priced in relation to international market prices. Within SSA, fertilizer use is mainly confined to export cash crops. Gregory and Bumb (2006) identified five pillars that are required to develop input markets and achieve market efficiency. Increasing supplies and market efficiency can reduce input prices. These five pillars are the policy environment; human capital development; access to finance; market information; and regulatory frameworks. These generic components need to be adapted in the context of country-specific situations. Holistic improvements in all areas will reduce transaction costs and improve accessibility to fertilizers in rural areas.

3. Constraints to Input Markets

Constraints affecting the performance of fertilizer markets and other inputs can be broadly divided into four groups: market development, technical, infrastructural, and output market deficiencies.

3.1 Market Development Constraints

Efficient markets need an enabling policy environment, adequate human capital (embodied in marketing, financial, and technical skills), adequate access to finance and market information, and effective enforcement of regulatory systems. In contrast, in spite of policy reforms in Africa, the policy environment remains uncertain, human capital is inadequate, access to finance and market information is limited, and the enforcement of regulations is ineffective in many countries. As a result, fertilizer markets are constrained and operate at sub-optimal levels.

Uncertain Policy Environment: Through liberalization and privatization efforts, many countries have removed price and marketing controls and the private sector has made significant inroads. However, there is a lingering fear in the minds of policymakers that the private sector is not capable of supplying inputs in a cost-effective manner and that the government therefore should intervene directly in the marketplace. Such government interventions are usually disruptive to private sector development.

Inadequate Human Capital: The quantity and the quality of human capital involved in the fertilizer business are limited. “Quantity” refers to the number of input dealers available in the country, especially in the rural areas, and “quality” refers to the marketing and technical skills of the people involved in the input business.

A developed input marketing system is served by an extensive dealer network into the rural interior, which makes inputs available to farmers at affordable prices and in a timely manner. In much of SSA there is a scarcity of dealers in the rural interior near smallholder farms. As a result, farmers must travel 20-30 km to purchase fertilizer, seeds, and other inputs. This raises the cost of inputs to farmers, either limiting the quantities they can afford to purchase or rendering them unable to purchase any inputs at all. This is exacerbated by the lack of marketing and technical skills of the few dealers available.

Limited Access to Finance: The fertilizer business is capital intensive, and access to finance is an important determinant of the supply chains’ abilities to conduct business activities. The limited outreach of the banking sector in rural areas of SSA, compounded by high interest rates and stringent collateral requirements, makes it difficult to access finance for business development. The lack of mechanisms for contract enforcement in rural areas also discourages the commercial banks from venturing into lending for input businesses.

Lack of Market Information: Market information is important for market development because it creates market transparency and information flows. The lack of an effective market information system poses a hindrance to the development of well-functioning input markets. Inadequate information makes it difficult (a) for the government and the private sector to plan ahead to address shortfalls or carryover stocks in the next season; (b) for the private sector to keep abreast of market requirements and shortages in different parts of the country and plan their marketing strategy accordingly to meet farmers' needs and optimize their returns; and (c) for market participants, including farmers, to be aware of the current market situation beyond their immediate geographic area.

Weak Regulatory Systems: In a private sector-led input marketing system, one of the critical roles of government is to protect the interests of consumers and the general public by formulating and enforcing a legal and regulatory framework regarding quality, standards and measures, safety in use and disposal of inputs, and business ethics. In SSA, either no regulatory framework exists or enforcement of laws and regulations is inadequate.

Size of Markets: SSA accounts for less than 1% of the global fertilizer market, and at the country level, the size of the market is even smaller. More than one-half of the countries use less than 10,000 nutrient tons, and more than 80% use less than 50,000 nutrient tons. Additionally, these countries use an unnecessary number of fertilizer products and thus fail to achieve economies of scale in production and procurement, leading to prices that are higher than necessary.

3.2 Technical Constraints

Continuous cultivation without proper and adequate use of mineral fertilizers and organic matter has led to nutrient depletion, land degradation, and low crop yields. Sound technical knowledge of fertilizer products on the part of farmers is essential to promote the adequate and timely supply of fertilizers in the countryside. The farmers' inadequate knowledge regarding the correct use of agricultural inputs is a serious problem. There is a need to update the fertilizer recommendations and make them more appropriate to the different agro-ecological zones and the input and output market realities faced by farmers. In many countries, fertilizer recommendations are based on the fertilizer trials conducted in the 1970s or early 1980s. With changes in cropping patterns, crop mixtures, and continuous cropping, there is a need to develop better fertilizer recommendations.

3.3 Infrastructural Constraints

In many countries, such as Zambia, Tanzania, Ghana, and Nigeria, main highways and inter-city roads are well maintained, but feeder roads linking main cities to other areas are in poor condition. Such roads add to transportation costs and make inputs costly. Improvement in rural road networks is essential to promote social and agricultural development and reduce transaction costs. Similarly, inadequate maintenance and poor operating efficiencies of rail systems, where available, either preclude the use of rail transportation or raise the cost to uneconomic levels.

Physical insecurity in rural areas also discourages the development of input businesses. Many input dealers, especially those operating input businesses in cities and district towns in Nigeria, Malawi, and Zambia, have reported that they were unwilling to open village stores because leaving fertilizer stocks there was unsafe.

Landlocked Countries: Not all countries in SSA have access to the coast and ports. Many countries (such as Mali, Burkina Faso, Uganda, Zambia, Malawi, Congo, Rwanda, and Burundi) are landlocked countries. These countries incur \$50/ton to \$100/ton for transporting goods from the ports to their borders. The mere geographic location of these countries acts against their farmers because farmers in these countries have to pay higher prices for imported fertilizers and receive lower prices for crop products. Regional procurement coordination and infrastructure improvement can be used to reduce the high costs associated with geographical isolation.

3.4 Output Market Deficiencies

Demand for fertilizer and other yield-enhancing inputs from smallholder farmers is restricted on two counts: inefficient and restricted output markets with low prices for surplus production and poverty levels that preclude participation in markets for purchased inputs.

Inadequate Output Markets: With the exceptions of peri-urban markets and out grower schemes for high-value export cash crops, the local, district, and regional crop markets are restricted in SSA because of low demand in the rural areas. This low demand is due to either low population levels or, in densely populated areas, to the absolute lack of purchasing power by the rural poor. Staple food production for self-consumption is essentially low-input, low-output farming with the major input restricted to family labor. Only if productivity is raised per unit area can land be released for higher value cash crops.

Low Output Prices: The economics of fertilizer use in SSA often provide inadequate incentive for smallholder farmers to use fertilizer because output prices are severely depressed at harvest time. The need for cash at harvest to repay crop production credit or meet family/education/social expenses usually means that smallholder farmers have to market product immediately. With undeveloped market systems, lack of market information, and inability to store until prices recover, they are at the mercy of traders offering market-clearing prices. Various programs have been developed to overcome these situations, including the formation of producer groups to organize farm-level gathering, grading and sorting, and marketing of produce from group positions of increased marketing strength. Another effort has been the introduction of warehouse credit schemes by which farmers receive a partial cash advance for their crops at harvest and the balance at a later sale time, with storage costs met by the increased price realizations at a later time.

Adequate demand and price realizations for saleable crops are required to provide cash incomes and the incentive to use purchased inputs on staple food crops. Herein lies

the poverty trap. To overcome this trap, donors, governments and non-governmental organizations (NGOs) have initiated various development programs that are considered to be pro-poor in so far as they are designed to introduce inputs, subsidize inputs, provide credit, support value-chain development for products with identified markets, strengthen public and private institutions, or adapt some combination of these objectives. The value-chain approach is currently in vogue with some donors and tends to be concentrated in the favorable agricultural regions and restricted to high-value crops and non-traditional export crops. Due to the lack of sizable and profitable markets and the restricted areas of implementation, the impacts are restricted to only a few of the millions of poor smallholder farmers in SSA. Is there an answer then to raising the millions of poverty-stricken smallholder farmers out of the poverty trap? What constitutes pro-poor growth?

4. Pro-Poor Growth

Decades ago, development cooperation concentrated on the poor in marginal regions (Bremen and Gregory, 2006). Lack of success caused a change in approach; in particular, public development cooperation focused more on favorable regions and privileged actors, while defending the thesis that economic development should be much faster and should reach the poorest of the poor by a trickle-down process. This approach also appeared less effective than was hoped, and since the formulation of the MDGs, the poorest of the poor and marginal regions are again in the spotlight. Degrading social security networks, undisclosed interests, and weak governance make the indirect road for reaching the poor too long and too tenuous to be pro-poor.

In recent years, development practitioners have shown considerable interest in analyzing pro-poor growth (Lopez, 2005; Dollar and Kraay, 2002; Easterly, 2001; Kydd et al., 2002; Cord et al., 2003 among many others). The literature covers definitional aspects of pro-poor growth, the complex interactions between income growth and distribution and changes in poverty, and the effectiveness of various policy reforms in stimulating pro-poor growth. In a recent review of contributions to the pro-poor literature, Lopez (2005) states that:

There seems to be some consensus in a few areas: (i) growth is fundamental for poverty reduction, and in principle growth as such does not seem to affect inequality; (ii) growth accompanied by progressive distributional change is better than growth alone; (iii) high initial inequality is a brake on poverty reduction; (iv) poverty itself is also likely to be a barrier to poverty reduction; (v) asset inequality seems to predict lower future growth rates; (vi) education, infrastructure and macroeconomic stability seem to positively affect both growth and distribution of income. Beyond this there seems to be little agreement.

Cord et al. (2003) define pro-poor growth simply as **“growth that benefits the poor.”** They elaborate as follows:

As an operational concept this implies that pro-poor growth policies are those that seek to increase the rate of growth of incomes of the poor, either directly by increasing demand for assets with which the poor are endowed or indirectly by channeling an increasing share of the benefits of economy wide growth toward the poor.

Kydd et al. (2002) elaborate three pro-poor development policy choices: *mainly manufacturing export-led growth plus welfare safety nets; mainly manufacturing export-led growth plus some broadly based agricultural growth; or broad-based agricultural growth*. The first mentioned option has the most adepts, while its first part—*mainly manufacturing export led growth*—receives much more attention than the second, the *welfare safety nets*. This is generally applied in SSA while lip service is paid to the other options. Analysis of the change in external input use after the structural adjustment of African economies provides confirmation of this (e.g., Jayne et al., 2003; Kelly et al., 2003a and b; Breman, 2000). A more direct indication is also the evolution of, for example, Malian agriculture (Breman, in press). In Mali the production of three relatively high-value crops is intensifying—cotton, maize and rice. This seems to be a process at the cost of marginalization of “poor men’s crops”—sorghum and millet, and small-scale animal husbandry. One wonders if more could have been expected from an economic adjustment that pursued privatization and liberalization.

Kydd et al. (2002) concluded **that some combination of broad-based agricultural growth with export-led growth is needed, with small welfare programs targeted at particularly disadvantaged and vulnerable groups**. The cost of large-scale welfare nets is likely to be excessive and unacceptable to donors. The authors insist that for pro-poor agricultural development poor smallholder farmers should be or should stay involved in the cultivation of high-value commodities. Their arguments are based on exploiting existing comparative advantages of small producers and combining these with institutional arrangements that can combine the transaction cost advantages of large-scale farms:

The policy implications are not to abandon support for smallholder producers but i) to 'get in quick' to raise their productivity while they still have comparative advantage; ii) look for institutional arrangements that can combine the different transaction cost advantages of large scale farmers.

The practical translation of such an approach is to improve productivity of staple food crops to release land for high-value crop production. This approach has been and is being followed in part by several value-chain development projects in SSA in which smallholder farmers act as out-growers or are linked to input and output markets. Evidence suggests that this concentration on value-chain development for identified output market demand rather than on wide-scale pro-poor growth does not provide the broad-based agricultural growth that is needed for such interventions to be pro-poor. At the same time, although the supply of productivity-raising inputs for participating farmers is always required, few resources are devoted to developing broad based input markets.

The views of Kydd et al. (2002) were endorsed by Timmer (2004) who stated:

Globalization and the availability of cheap grain in world markets change the story in important ways, but do not alter the importance of gains in agricultural productivity to reductions in poverty. The linkages are less direct, however. Stimulating them requires a far more subtle role for government. Attention is more on the rural economy broadly than on food crop production *per se*. Rural-urban linkages, including migration and remittances, are a major part of the story. Prices for staple grains in world markets are low and stable, and emphasis has turned to diversification and access to supply chains that provide middle class (and foreign) consumers with fruits, vegetables, processed foods, and livestock products. Making agricultural productivity contribute to pro-poor growth is more complicated than during the first decades of the Green Revolution, but the potential is real and among the most cost-effective approaches for reaching the poor.

He continued:

No country has solved its problem of poverty through agricultural development alone (much less through higher productivity for a single commodity such as rice). At the same time, no country (except Singapore and Hong Kong) has solved its problem of poverty *without* creating a dynamic agricultural sector. The secret is a successful *structural transformation* where agriculture, through higher productivity, provides food, labor, and even savings to the process of urbanization and industrialization. With highly unequal distributions of income, caused to a substantial extent by highly unequal land ownership, agricultural growth actually seems to exacerbate poverty. By contrast, when a country's income distribution is relatively equal, agricultural growth stimulates the rest of the economy at the same time that it strengthens the connection of the poor to that more rapid growth. In such settings, **agriculture is truly the “engine of pro-poor growth.”**

In the light of national, regional, and aggregate data on the continuing poverty crisis, it is obvious that current development programs, which concentrate on value-chain development for identified high-value crop markets, are not having a broad pro-poor impact for the majority of smallholder farmers. Smallholder participants within these programs are reaping substantial rewards, but there is little or no “trickle down” to non-participants. The reason probably lies in the fact that these programs are concentrated in market development areas defined in IFDC's *Strategic Framework for African Agricultural Input Supply System Development* (IFDC, 2000) as Stage II or III.

Four development stages are defined: (I) Non-existence, (II) Emergence, (III) Growth, and (IV) Maturity. Different agricultural sub-sectors or regions within a single

country can be at different stages of input market development. For example, high-value horticultural crop export sectors can be at Stage III while cereal-based cropping systems in the same region may be at Stage I or II. These stages reflect not only the technical agro-climatic and economic conditions for profitable fertilizer use but also the policy, institutional, and social environments.

Most agricultural development efforts focus on regions and farmers represented by Stages II and III. Stage II can be opened up for intensification. Provided governments, donors or NGOs are pursuing this goal at all, the complication is that most attention goes to technology transfer. Integrated soil fertility management and other technologies can indeed improve the economic feasibility of using fertilizer. However, improvement of the socioeconomic and policy environments, especially to develop private sector service industries, is just as important and often has more impact.

This approach to the pro-poor inclusion of smallholder farmers in Stage II incorporates the holistic socio-institutional changes advocated by Gregory and Bumb (2006) in the five pillars of market development. In many development programs, however, few or no resources are dedicated to the development of input market networks and the capacity-building of private sector input dealers. Such programs rely on the existing thin market networks established in Stage III areas and linking smallholder farmers in Stage II to these networks. Development incentives are required for market network expansions and increased capacity to occur. Examples of such developments are to be found in Malawi, Nigeria, Ghana, and Uganda where large numbers of small competitive input dealers, whose abilities have been developed through training and institutional organization in trade associations, have provided improved access to credit, market information, technical capacity, and the critical improved access to fertilizer and other inputs for smallholder farmers in less favorable regions, thus improving accessibility and affordability for farmers.

New approaches have to be developed to tackle the problems of Stage I farmers so that broad-based agricultural development can commence. Input voucher schemes can provide a partial approach although vouchers by themselves are insufficient to bring farmers from Stage I to Stage II.

5. Input Vouchers

Input vouchers constitute a flexible market development policy tool that permits voucher holders to purchase specific quantities and types of inputs from trained dealers who agree to accept vouchers as payment; the dealers can then redeem the vouchers from the program organizers with an agreed margin to cover their expenses and agreed level of profit. The programs include a targeting mechanism, a financing mechanism, and a voucher redemption system with built-in safeguards against fraud; when well-designed, they need to be implemented through normal commercial channels to assist development of private sector market network dealers and rural financial agencies.

Targeting of voucher recipients requires an understanding of the production constraints faced by the rural population and the particular socioeconomic constraints faced by the poorest. There is a need to complement explicit development initiatives with carefully targeted initiatives for the poorest that span the humanitarian-development bridge by building or rebuilding the asset base of the targeted group. Voucher programs are essentially “market-smart” subsidy programs that provide defined incentives for farmers and input dealers.

Input voucher programs are a pro-poor, market-friendly means of providing either direct “market-smart” subsidies or crop production credit to resource-poor subsistence farmers or ensuring emergency market recovery following droughts or other emergency situations. Integral characteristics of voucher programs are the provision of technical assistance and training to both the recipient farmers and private sector input dealers and the targeting of voucher recipients. This ensures that the vouchers are not used just to supply free or subsidized fertilizer or other inputs.

From a development viewpoint, vouchers are only one component of a range of initiatives to promote market development. Their specific role is to provide a means of transferring assets to the targeted farmer beneficiaries that will enable them to increase productivity of staple crops, produce more saleable surplus, increase land devoted to higher value crops, and raise incomes. At the same time, vouchers should provide an incentive for small input dealers to develop their businesses. This is achieved by initially providing guaranteed demand and margins. For both groups of beneficiaries, these incentives are supplemented by capacity building and linkages to initiatives in output marketing, financial services, and market information. The final objective is to bring about sustainable increases in agricultural productivity and increased rural incomes for targeted participants.

From a humanitarian viewpoint, input vouchers will assist in re-building assets after natural disasters. They need to be supplemented, however, with more immediate food or cash aid because the benefits from input supply are delayed until the end of the crop cycles.

Subsidized input programs have generally been expensive and unsuccessful as well as rarely equitable in SSA, with benefits accruing mainly to larger farmers. In the past, fertilizer subsidy and promotion programs have essentially been direct budgetary support payments to lower the farm-gate prices of fertilizer, and most have suffered from high unsustainable costs, administrative inefficiencies, and rent seeking. For example the Fertilizer Support Program (FSP) in Zambia was designed to increase food production, alleviate rural poverty, and improve rural food security through the provision of subsidized fertilizer to 8% of smallholder farmers. It was administered through the Ministry of Agriculture and Cooperatives (MACO). During the 2002/03 cropping season, the FSP accounted for 40% of the MACO budget and 30% of total government expenditure on agriculture. In spite of this huge cost (140 billion kwacha), there is evidence that the targeting was inaccurate and the cost exceeded the increased value of

additional maize produced. It was disruptive to the private sector and curtailed the extension and research activities of the MACO.

There are sound economic arguments that fertilizer subsidies are distortionary and inefficient; in circumstances, however, where lack of purchasing power is pervasive, as is the case for most smallholder farmers in SSA, then “market smart” subsidies can be considered as temporary interventions in combination with other policy instruments to develop sustainable commercial markets.

Other indirect subsidies can be used as alternative or complementary interventions. These include capital cost subsidies, public provision of goods and services (e.g., research and extension), and subsidized market transaction costs (e.g., transport tax and trade tariff exemptions).

When used for “smart subsidy” distribution, the value of the vouchers can be set at any percentage of the market value of the input package and can be reduced over time; this approach is equivalent to removing the subsidy over a number of years as the recipient farmers improve their productivity and incomes, thus providing an exit strategy. Alternatively, the vouchers can be changed after a number of years to crop credit mechanisms by which the recipients pay back the value of the voucher package at harvest time or some later date.

Vouchers can be used to build additional demand for inputs where targeted farmers are not already using purchased inputs due to lack of purchasing power or too great a perceived risk in using fertilizer. In this way, vouchers can be used to assist in converting smallholder farmers into market participants. However, the crops and soils of targeted farmers need to be fertilizer responsive.

Use of vouchers as part of a “demand-pull” strategy to enhance demand has many potential advantages over programs that distribute subsidized inputs, usually through government agencies:

- Vouchers can be used to target specific groups of farmers based on specific crops, regions, or socioeconomic class.
- Programs have built-in exit strategies.
- Programs assist the emerging input dealers to invest in their businesses and increase their ability to finance stocks.
- Both farmers and dealers are trained to improve their knowledge concerning efficient input use.
- Vouchers can also be used to augment purchasing power for farmers already aware of benefits but unable to afford their real demand.
- Vouchers have a limited liquidity compared to cash.
- Self-targeting can be used through work-for-voucher programs.

- As support after droughts, voucher programs can be more cost efficient than continued food aid.

There are, however, some disadvantages:

- The inherent voucher subsidies reduce risk for smallholder farmers, and the increased input use must demonstrate sufficient incentives for sustainable use at market prices.
- Administrative costs can be high, especially if a targeting mechanism is employed.
- Unless vouchers are recipient specific, a secondary market can develop and cause leakage from the intended target recipients.
- Input vouchers are restricted in use to those crops and soils that are responsive to fertilizer.
- Accurate targeting is notoriously difficult in the socioeconomic climate of SSA.
- Planned voucher value-reduction programs can be disrupted by droughts in all or part of the target regions.
- To capture the full benefit of market development, voucher programs should be considered as long-term programs of at least 5 years and preferably 10 years.
- Donor support has yet to materialize that will enable long-term programs to be implemented.

Table 1 illustrates the conditions under which voucher programs are likely to have a great deal of success, together with other initiatives to stimulate demand, supply, and output markets. Where fertilizer responses to input and crop management packages are not proven, cash or food aid support for the poor or other direct welfare support is required.

6. IFDC Experience with Voucher Programs

IFDC has implemented three input voucher projects that have been pro-poor and illustrative of three different objectives – increased food security, implementation of direct subsidies, and post-emergency crop credit provision.

In collaboration with an NGO consortium, IFDC provided vouchers to 100,000 subsistence farmers in Malawi in return for NGO-supervised work on village feeder roads by voucher recipients. This program was funded by the Department for International Development (DFID) and the World Bank. It represented an alternative to the starter pack programs formerly administered by the Ministry of Agriculture, Food Security and Irrigation and contributed to food security.

In conjunction with the Food and Agriculture Organization of the United Nations (FAO)-funded National Special Program for Food Security (NSPFS) and the Federal Government of Nigeria Project Coordinating Unit (PCU), IFDC conducted a pilot voucher scheme aimed at demonstrating a targeted fertilizer subsidy mechanism operated through the private sector in Nigeria.

In Afghanistan, IFDC used vouchers as a post-conflict emergency marketing tool for almost 200,000 small farmers. Urea, diammonium phosphate (DAP), and wheat seed (via the International Center for Agriculture Research in Dry Areas [ICARDA]) were provided as a crop production credit with voluntary post-harvest repayments to local (village) administrations for infrastructure investment. This intervention was funded by the United States Agency for International Development (USAID).

These voucher systems illustrate the flexibility of this practical policy tool and demonstrate how food security and market development can be linked with benefits for all participants. For donors they provide a means of supporting both poverty alleviation and sustainable market development with an exit strategy.

6.1 Malawi

Smallholder maize yields per hectare in Malawi are some of the lowest in the world—a result of poor soils, erratic rainfall, and low input use. Many rural households face food shortages for several months of the year. Free distribution of seeds and fertilizer to smallholders, particularly through the “Starter Pack” and “Targeted Inputs” Programs, had a beneficial impact on overall food production but depressed the demand for inputs from the private sector dealers when distributed through government agencies that excluded private sector participation. Efficiency was also hampered by poor targeting.

Small-scale dealers faced a number of barriers including lack of access to credit, limited knowledge about storage and use of inputs, and low purchasing power on the part of their customers.

The Sustaining Productive Livelihoods Through Inputs for Assets (SPLIFA) project had three aims:

- To enable marginal farmers to achieve household food security by providing them with 50 kg urea top-dressing and 10 kg hybrid maize seeds in return for labor on public works programs (roads).
- To improve rural transport infrastructure by building or upgrading feeder roads
- To engage small-scale agricultural inputs dealers in the distribution of inputs to ensure cash flow into the local economy and to build dealers’ capacity to deliver extension messages on correct inputs usage

SPLIFA was funded by DFID and the World Bank and implemented by Africare, CARE, Emmanuel International, Save the Children, and IFDC in nine districts of Malawi. The program targeted 100,000 households and 200 dealers over 2 years.

Implementation Details: NGOs (Africare, CARE, Emmanuel International, and Save the Children) worked with district planning authorities to identify roads that required repair or upgrading. Once these roads were identified, road committees were formed to oversee the selection of beneficiaries.

IFDC identified agricultural dealers in each area to act as the distribution points for inputs. A precondition of participation was membership in the AISAM network (Agricultural Inputs Suppliers Association of Malawi); dealers were given the opportunity to join if not already a member.² Once selected, dealers were trained in the voucher redemption process, business management methods, and inputs storage and usage, and they were required to open a bank account to facilitate the payment of service commissions. Dealers were also expected to play a role in transferring messages on correct inputs usage; thus, they were trained in demonstration plot management and given leaflets depicting correct usage techniques for distribution to beneficiaries when they redeemed their vouchers.

IFDC organized the procurement of urea and seeds and the delivery of the inputs to different dealers, according to the number of beneficiaries in each dealer's catchment area, by tender through the private sector importers.

Road construction took place between June and October and was overseen by the NGOs. Upon completion of the road to a satisfactory standard, each beneficiary was issued a voucher for 50 kg of urea and 10 kg hybrid maize seeds. The voucher was designed in such a way that the seed portion could be redeemed before the fertilizer portion to allow timely planting of seeds if necessary.

Once vouchers had been exchanged for inputs, dealers returned them to IFDC where, after checking, they were paid a service commission of US \$1.00 for each voucher. The value of the service commission was approximately equal to the retailer's profit on a bag of fertilizer had they bought it themselves. Figure 1 illustrates the operations of the voucher scheme.

Results/Impact: About 800 households, disaggregated by gender of head of household, were engaged in a panel survey in which data relating to various livelihood indicators and agricultural practices were gathered on a quarterly basis. Comparing the results of 1st cycle beneficiaries with those of non-beneficiaries and the results of 2nd cycle beneficiaries with those of 1st cycle beneficiaries who had "graduated" from the program allowed the precise measurement of impact.

² AISAM was established by IFDC under its USAID-funded Agricultural Input Markets (AIMS) Project.

- Beneficiaries experienced a statistically significant increase on their previous year's maize yields as a result of the inputs. In 2003/04 mean overall maize yields increased by 64% for male headed households and 50% for female-headed households, but they started from a very low base of 302 kg and 225 kg, respectively, in 2002/03.
- In the same year the project was successful in doubling the number of male-headed households (MHH) and tripling the number of female-headed households (FHH) that harvested more than the 600 kg of grain that the average Malawian household requires annually for consumption purposes. However, the magnitude of these impressive statistics is diminished when one considers that in 2002/03 only 11% of MHH and 3% of FHH harvested more than 600 kg.
- Impact was reduced in both years by dry spells, especially in 2004/05, when much of the national maize crop was destroyed by a drought in February 2005. Late delivery of inputs also caused problems in both years. In the first cycle, funding delays resulted in the late delivery of seed, meaning that many farmers used their own 'local' varieties, often high-yielding varieties (HYV) recycled several times. In the second cycle, fertilizer deliveries were delayed, resulting in many farmers applying the urea after the optimal date. Although fertilizer was applied late, it did have some effect in helping the plants survive the dry spell; under the circumstances, however, a timely distribution of basal dressing would have served the beneficiaries' needs better.
- As far as distribution was concerned, the outcome was encouraging. Over the 2-year period, 200 dealers were involved in the scheme, sharing US \$100,000 in service commissions between them.
- Service commissions were reinvested in agricultural inputs, in buying tobacco and other outputs for resale, in improving premises, and, in some cases, opening additional outlets. No incidents of fraud were reported, and just 0.37% of the inputs went missing from dealers' premises (replacements were bought from the concerned dealers' service commissions).
- Where dealers did make the effort to run demonstration plots, beneficiaries reported high levels of satisfaction with them; unfortunately, the number of dealers who ran plots was quite small. Transferring messages on inputs usage at the point of distribution did not work well because beneficiaries tended to arrive at a dealer's premises en-masse and then set off back to their villages as quickly as possible once they had redeemed their voucher. Pictorial guides illustrating how the inputs should be used were distributed and were reasonably successful. The major obstacles deterring dealers from running demonstration plots were distance from beneficiary communities and late delivery of inputs for use on the plots.
- There is widespread distrust of vendors in Malawi. The SPLIFA program, which gave dealers an opportunity to act as honest brokers, went some way to building bridges between this nascent entrepreneurial class and their potential client base.

- The road infrastructure created by the project had a number of positive impacts. Residents of villages served by the roads were most appreciative of the way that access to public services such as hospitals and schools was eased. Accessing public transport became easier as traffic increased, and wear and tear to bicycles and ox-carts was reduced. Many villages reported a decrease in the number of robberies because widening of roads had removed robbers' ambush sites. Shopkeepers with premises on the new roads reported a significant increase in customer numbers and turn over. They were able to widen the range of goods they stocked and reduce the prices of some goods because of lower transport costs.
- Yield results show that male-headed households tended to get better returns than female headed households, and households who participated in the program for two consecutive cycles (2003/04 and 2004/05) fared much better in 2004/05 than those who received the inputs only in that year.
- Double-cycle beneficiaries may have fared better because of greater labor availability stemming from the increased food supply, which reduces the need to do agricultural piece work (ganyu) during the growing season and, in turn, allows more time to be spent tending their own crops. They may also have benefited from application of lessons learned from the previous cycle.
- It is likely that labor constraints faced by female-headed households prevented them from making the necessary investments in crop management at the critical stages of the maize cycle (weeding in particular).
- The median value of assets owned by beneficiary households rose by up to 15% in the year after the intervention, but a year later the value of assets owned decreased from previous levels as they were sold to buy food. Households involved in the program experienced a decrease in Coping Strategy Index (CSI) scores (a CSI score is derived from the frequency with which a household resorts to an array of "coping strategies" of varying severity), but their scores increased again once they were precluded from participating for a second year.
- Although the drought of 2004/5 had a considerable negative impact (CSI scores were up to 37% higher in May 2005 than at the same time in 2004), receipt of inputs lessened the rate of increase of the stress level (CSI scores of MHH who received the inputs increased at less than a third of the rate of non-recipient households).
- Female-headed households derived less benefit from the project than did the male-headed households (as measured by yield increases and improvements in livelihood indicators). The reasons for this are not fully understood but probably include labor constraints during critical crop management periods.

Lessons Learned: Despite not deriving the full potential of the inputs because of late delivery and drought, the scheme was extremely popular with beneficiaries, most of whom had been accustomed to public works programs that paid in either cash or food. Over 80% of beneficiaries reported that they would rather be paid in inputs than cash or

food for the same value (about US \$30) because of the accumulated value of the payment. Other reported reasons for voucher preference were the fact that it is not as liquid as cash, which provides less temptation to spend on other things and, if used properly, it yields more than its value in grain yields.

The weather conditions experienced in both years that the project was operational demonstrated the risk of a strategy that focuses solely on increasing maize production as a means of attaining household food security. Dry spells at critical stages of the maize cycle reduced yields significantly in the second year. It could be argued that provision of a basal dressing instead of urea would have served farmers needs better by strengthening the plants' resistance to drought. This option was excluded because of the cost to donors.

Timely delivery of inputs to farmers is critical to the success of an intervention of this nature. In Malawi—landlocked and affected by congestion at the major ports in Mozambique—this means ordering fertilizer at least four months before it is needed by the farmer.

It would have been very difficult to distribute the inputs through dealers had they not been members of the AISAM network. Being able to deal with national and district level AISAM representatives rather than having to contact each dealer separately made for great efficiencies in organizing delivery schedules and payment of service commissions. Moreover, peer pressure and the risk of sanction by or expulsion from AISAM deterred dealers from selling the inputs or attempting to defraud beneficiaries.

Regarding the SPLIFA project, the minimum total service commission was about US \$800 (which paid for the distribution of 800 input packs). The dealers did not want to participate in anything less than this amount. Linking payment of service commissions to operating demonstration plots to a satisfactory standard could be considered.

Double-cycle beneficiaries derived particular benefit from the project; they were able to apply lessons learned from one year to the next and make livelihood strategy decisions with the knowledge that they would receive inputs for two consecutive years.

Community targeting (where beneficiaries are selected on the basis of food security status by a committee comprised of community members) works well (resulting in low levels of inclusion error) if the committee is aware that (1) they will be held accountable for poor selection and (2) grievance procedures are made clear to communities.

6.2 Nigeria

The National Special Program for Food Security (NSPFS) and the IFDC Developing Agricultural Inputs Markets in Nigeria (DAIMINA) project implemented a pilot project on the use of fertilizer vouchers in three states in 2004. The objective of the project was to allow farmers to procure fertilizers with a 25% subsidy from private dealers, complementing the government distribution channel and increasing the density of the outlet network. The pilot was expected to demonstrate the potential for a more

efficient private sector management system of the state and federal government fertilizer subsidy to targeted beneficiary farmers.

The Federal Government of Nigeria (FGN) supports subsidizing of fertilizer for smallholder farmers. In 2003 approximately 120,000 tons of fertilizer was procured from private sector importers and distributed to all states for sale at 25% below the prevailing market prices. At the state level, allocations were made to Agricultural Development Projects (ADPs) and state-owned blending plants for sale to farmers. There was little transparency in the distribution, and there is anecdotal evidence that the FGN was often not recompensed by the ADPs or state blending firms. In 2004 the FGN announced that 240,000 tons of fertilizer would be subsidized at a rate of 25%. This would represent about 30% of the total forecast demand in 2004. Continuation of this subsidy system is disruptive to the development of the private-sector market network in Nigeria and does not ensure that the beneficiaries are smallholder farmers.

The NSPFS operates in all states. In each state there are three farmer groups that receive subsidized fertilizer and are provided with technical assistance to improve food crop production. This program is supervised by FAO and implemented by the FGN Project Coordinating Unit (PCU) of the Ministry of Agriculture.

The DAIMINA project signed an MOU with the PCU to implement a pilot voucher scheme in 2004 on ten of the SPFS sites in three of the four states covered by the project.

Voucher Scheme: The objectives of this pilot scheme were to:

- Ensure that the government subsidy reached the targeted beneficiaries at the right time.
- Demonstrate that the subsidy was successfully administered through the private sector.
- Strengthen linkages between farmers and the agri-input dealers in rural areas.
- Demonstrate the capability of the private sector in the timely delivery of fertilizers at competitive prices.
- Facilitate the government's withdrawal from direct procurement and distribution of fertilizers.

Advisors from the SPFS determined the fertilizer requirements for participating farmers and allocated on average 3 bags of combinations of urea, NPK, and single superphosphate fertilizers per farmer in Abuja, 6 bags in Bauchi, and 12 bags in Kano. A total of 385 tons was allocated for the project.

The fertilizer allocated to the PCU/SPFS for supply to SPFS farmers was delivered free on trucks to the selected dealers, who were trained by the IFDC project.

A list of SPFS farmers eligible for subsidized fertilizer was provided by SPFS to the dealers. IFDC and SPFS staff conducted training meetings for the farmers and dealers at each site. The farmers were assigned to the dealers for provision of fertilizer and other inputs and provided with individual vouchers. Farmers took the vouchers to their nominated dealers, signed or marked their voucher in the presence of the dealer, and purchased their fertilizer allocation at 25% below the market price plus a service charge of 5%, which was retained by the dealer. All sales were on a cash basis with receipts issued by dealers. Dealers received technical advisory materials in local languages to handout to farmers at the time of purchase.

The dealers were required to make a 50% payment to the ADPs at the time of delivery and 50% within 60 days after delivery. Commercial interest rates were applied for overdue accounts, and the PCU/SPSF could take possession of unsold fertilizer and charge for additional transport and handling costs.

Dealers were required to maintain full records of stocks and sales of subsidized fertilizers on a daily basis and allow IFDC/SPFS staff to check vouchers against these records. Monitoring and evaluation consisted of surveys to compare all input sales of participating dealers with their sales in the previous year and against non-participating dealers in the same districts. SPFS monitored yield data from participating and non-participating farmers.

Results: Surveys of participating farmers and dealers were carried out in 2005 by staff from the SPFS project. Overall both farmers and dealers were enthusiastic with the pilot project and asked for it to be continued. Farmer experience was:

- All farmers (except for one) purchased fertilizer using their own resources.
- Farmers in Kano failed to utilize all of their allocations due to lack of purchasing funds and possible over allocation by SPFS. Some farmers in Bauchi failed to utilize their full allocation due to lack of rain.
- 66% of farmers indicated that it was easier to obtain subsidized fertilizer than in 2003 under the previous government scheme.
- 45% of farmers said that fertilizer supplies were in greater proximity to their farms than previously.
- 62% of farmers purchased fertilizer at a lower price than previously, possibly indicating that they had previously resorted to the higher priced open market to obtain supplies.

Farmers generally expressed satisfaction with the voucher system and wanted it to continue because it provided easy and timely access to cheaper subsidized fertilizer and accessibility to supplies was improved by the proximity of dealer locations.

Dealers were generally favorably disposed to the sale of fertilizers through the voucher system but indicated some early implementation problems regarding the countersigning and endorsement of vouchers.

- Dealers appreciated the 60 day credit for 50% of the supplies and the timeliness of deliveries, which were within a week of their initial payments.
- Dealers paid for fertilizer from their own resources although some received pre-payment from farmers or from apex associations of farmers. No dealers resorted to formal credit facilities to finance fertilizer purchases. Because most sales occurred within a six to eight week period following delivery to dealer stores, dealers were easily able to finance payments from sales revenues.
- Dealers reported that it was very easy to obtain their allocations upon payment of the 50% payment.
- All sales to farmers were on a cash basis only.
- Record keeping was adequate, but many dealers used outside assistance to maintain records due to their own literacy inadequacies. There was some evidence that records were completed post transaction.
- The government received payment in full for all fertilizer supplied.
- Dealers expressed satisfaction with the 5% margin provided.
- Few dealers showed any increase in other input sales to participating farmers. Because many were recent input business start-ups, continuation of the project might have produced a more positive result on this score.

Dealers generally expressed satisfaction with the voucher system and wanted it continued. Advantages of the system were seen as ease of obtaining supplies, better security provided by the method of stock deliveries, and the ready market for the supplied fertilizer.

Several of the pilot scheme stakeholders were critical of the cumbersome administration procedures for the voucher endorsements and cross checking. Concern over leakage and fraud were primary initial concerns in project design. Experience has provided insights into improving this aspect and the system can be improved without compromising security.

The pilot project illustrated how targeted allocation of directly subsidized fertilizer can be achieved in a transparent and equitable way for the benefit of the intended recipient farmers. Scaling up of the system should include facilitation of access to trade credit and, for the poorest farmers', access to crop credit through the dealers after training. Voucher documentation could be improved by having it available in local languages for less literate small dealers.

6.3 Afghanistan

In the 1970s, Afghanistan was largely self-sufficient in its food requirements. In the years of conflicts and wars starting in the late 1970s, the area and production of wheat declined considerably as farmers abandoned their farms and took refuge in neighboring countries. The average yields of wheat are low—only 1.2 to 1.5 tons/ha in good years. In

the past Afghanistan was a primary regional supplier of fresh and dried fruit, nuts, and livestock products.

Several problems hindered the resurgence of agriculture in Afghanistan—insecurity in the rural areas, abandoned farms, lack of field extension, absence of credit, inadequate supply of inputs, un-informed input dealers, breakdown of communications, irrigation systems in disrepair, etc. Although some of the problems could only be resolved in the medium or long term, a few challenges such as the emergency supply of agricultural inputs and development of the agri-input markets could be tackled on a short-term basis with quick results. The programs undertaken to provide immediate impact were designed accordingly.

The Emergency Fertilizer Distribution Project (EFDP), funded by USAID, was implemented during March 21, 2002–September 30, 2003, to attain the goal of increased food production, food security, and stability in the rural areas through two main objectives:

- Arrange emergency supply of fertilizers for needy farmers.
- Develop agricultural input markets.

Several strategies were developed after an initial assessment of the situation, such as employing the services of established NGOs with field organizations, coordinating field activities with the local “shura” (town committees), and using vouchers to make the intervention with fertilizers to the farmers market friendly. Additional strategies were using money changers in the absence of banks, training dealers for developing the agri-input markets, judiciously using media for communicating with several “publics,” and employing short-term consultants.

Project Activities: Emergency distribution of fertilizer, one of the main project activities, was undertaken immediately after the project started. During the project period, 16,600 tons of fertilizer was distributed to about 200,000 farming households in Afghanistan. This distribution was carried out using the voucher system to attain the twin objectives of making an intervention in the market with fertilizers for the needy farmers, involving the private sector dealers, and helping the market to grow. Under this system, instead of receiving fertilizer in kind, a farmer received a voucher entitling him to a specific quantity of fertilizer obtained from local dealers and paid for with a voucher. The dealers were reimbursed by the project for the value of the vouchers collected. Farmers were asked to pay the local shura for the fertilizer in cash or kind at harvest time. The shuras used the funds thus generated for local development projects. As an illustration, a flowchart of fall fertilizer distribution using vouchers is shown in Figure 1.

The vouchers were distributed to the farmers through NGO partners. The voucher system used in Afghanistan proved to be very useful in making market-friendly interventions. It was a win-win situation for all—the farmers, the dealers, and the local shura. Vouchers were used in several distributions undertaken by the project for these cropping periods:

- Spring Seeded Wheat 2002.
- Fall Seeded Wheat 2002.
- Second Topdressing of Fall Seeded Wheat.
- Spring Seeded Wheat 2003 (*NP Fertilizer Trials*).
- Summer Crops 2003 (*Including Potash Trials in Vineyards*).

In addition, improved wheat seed was distributed to the same farmers by ICARDA through the same NGOs as used by IFDC for voucher distribution.

Dealer Training and Development: Although there was a network of approximately 1,400 agri-input dealers, mainly dealing in fertilizers, they had limited knowledge of fertilizers and their proper use and of modern crop production technology and business management. To develop the agri-input markets on a sustainable basis, it was necessary to develop the dealer network. During March 2002-August 2003, 32 dealer-training workshops were held in 22 (out of 32) provinces. More than 800 dealers, 400 NGOs, and the Ministry of Agriculture and Animal Husbandry (MAAH) extension department staff were trained in the basics of fertilizer and crop production technology and marketing of fertilizers.

Monitoring and Evaluation (M&E): In the absence of any reliable data about agriculture or agri-inputs, the project carried out several baseline surveys. In addition, surveys for monitoring and evaluation of project activities and the impact of the project on the farmer's agricultural production were also undertaken. The surveys were designed by IFDC, and actual fieldwork was carried out by the staff of the NGO partners, the MAAH extension department, and IFDC.

Two surveys of the dealer network were carried out; the first was a comprehensive nationwide baseline survey and the second was a limited survey in a few provinces. These surveys provided valuable information about the dealer network and its capacity.

For the purpose of monitoring and evaluation, a post-fertilizer distribution survey was carried out to characterize the farmers that benefited from the programs, success of the distribution in reaching the target farmers, and use of the inputs and impact on farmers' production. This survey was conducted in 12 provinces and covered a sample of 2,210 farming households. The survey indicated that 98% of the farmers had received the inputs, and the farmers felt that when comparing yields from the IFDC/ICARDA package with their own package, the yields were either about the same or 2.08 times higher. When compared with not using any fertilizer, the yields were 1.8-4.5 times higher.

Surveys were also carried out to determine production and productivity. The potential wheat yield was estimated on the basis of detailed crop cut data obtained from the field. Plot demonstrations and trials were also laid out to determine response to the use of proper inputs.

An initial survey was developed to establish the baseline information for implementation of a price monitoring system.

Use of Media and Publications: The media—press, radio, and television—was used judiciously to communicate with the “publics” about the project activities and also impart information about fertilizer use and agricultural technology. A number of charts, leaflets, and posters containing information about the recommended input use and crop production technology were produced.

Results:

- About 16,600 tons of fertilizer, mainly urea and DAP, was provided to about 200,000 needy farmers, including the returning refugees, on an emergency basis in the spring and fall 2002 seasons and in the spring and summer 2003 seasons in 13 agriculturally important provinces of the country.
- Of the total, 900 tons of fertilizer was distributed for crops other than wheat and 15,700 tons was for wheat. The estimated benefits were:
 - 15,700 tons of fertilizers used on wheat is estimated to provide an incremental yield of 78,500 tons of wheat grain (1 kg fertilizer = 5 kg additional grain); this is enough to provide food for about 460,000 Afghans for one year.
 - 900 tons of fertilizer used on crops other than wheat was estimated to provide an incremental 4,500 tons of these high-value crops; this is a net increase in the gross revenue of the farmers equivalent to about \$2.25 million, assuming the average crop price at \$500/ton.
- About 800 agri-input dealers were trained in basic product knowledge, crop technology, and marketing and business principles in 32 training workshops held in 22 of 32 provinces.
- Through the distribution of crop technology leaflets, brochures, and charts and the conduct of field days at several demonstration plots, modern agricultural crop production technology has been transferred to a large number of farmers.
- Wheat yields of the recipient farmers (seed and fertilizers) assisted by extremely favorable weather conditions, averaged 4 tons/ha although there was considerable variability.
- Village and town committees (shura) used the generated funds for repairs of local roads, irrigation channels, and other urgent needs.
- Project spending of about \$0.9 million for local staff salaries, transportation, etc., contributed to the local economy and produced a multiplier effect.
- The energizing and training of the dealer network and a number of other factors led to a 50% increase in fertilizer consumption from 170,000 tons in 2001/2002 to 255,000 tons in 2002/2003.

6.4 Costs of Voucher Programs

As reported the administration costs of voucher schemes can be high especially when targeting is involved. The training costs for dealers are normal development project costs, but they have been included in the following voucher project costs.

The implementation costs for the project in Afghanistan were approximately \$8/farmer. In Malawi the average cost was \$11/farmer, excluding the costs of supervision and materials for road construction and maintenance in year one. However, the cost was only \$5/farmer in year two with a larger number of farmers. Procedures for combating fraud including “tamper proof” vouchers can be expensive especially when the vouchers are issued for use only by named individuals, which remove any secondary markets in vouchers. Targeting has to be related to the voucher program objectives. In Malawi and Afghanistan where local committees and NGOs with intimate local knowledge were involved in identifying participants, targeting proved to be fairly accurate and not unduly expensive. Self selection through work for vouchers or selection by reference to some measure of food insecurity or social structure (e.g., female heads of households) can be readily available and local committees can be made accountable for targeting accuracy. Close field supervision is required, but the benefits that accrue from transparent and equitable systems are significant. The improved production in Afghanistan provided a four-fold return on investment and a lower cost compared to supplying food aid.

Large-scale implementation of voucher systems can probably reduce the cost to \$3-\$4/farmer. Combined with the other market development initiatives required for a holistic approach, the cost would be about \$30/farmer plus the cost of inputs subsidized. Large-scale projects are expensive and therefore require well-defined and publicized objectives, timelines and exit strategies.

6.5 Exit Strategies

Voucher schemes improve access to inputs and linkages between farmers and input dealers. The dealers’ business and technical skills are improved through training, and the technology packages made available to farmers assist in improving farm production and food security. The end results must be sustainable increases in farm productivity and rural incomes.

Depending on the circumstances, the improvements in farm production must be matched by improvements in output marketing. This can be achieved through the introduction of collective marketing of surplus production, crop diversification, warehouse receipt schemes, and capacity building of output market operators. Farmer associations can play a vital role in organizing collection, grading, and standards to achieve bargaining power in marketing outputs.

As farm incomes increase, the value of vouchers can be gradually reduced to zero or transposed to crop production credit or revolving funds.

The time horizon for sustainable impacts will vary between targeted groups of participants. Farmers in regions at Stage II development may only need an input voucher program for 1-2 years at a limited subsidy level whereas farmers in Stage I may require a 5- to 7-year program to reach a sustainable condition. Given the high costs of providing subsidized inputs for large numbers of farmers over a number of years, very careful design and implementation of programs should be undertaken with clearly defined objectives and exit strategies. Monitoring of impacts, especially on food security and farm profits, needs to be undertaken to ensure that the desired objectives are being achieved.

7. Conclusions

Early indications are that vouchers provide pro-poor flexible interventions that reduce risk in developing markets for the most food-insecure and small nascent input dealers. Sustainable development can be achieved only when vouchers are used in conjunction with other necessary market development initiatives and impacts monitored. They can provide a flexible means of providing crop production credit by donors with benefits for both food-insecure farmers and agri-input dealer networks. They can play a vital role in “jump starting” market inclusion for millions of smallholder farmers in SSA. Each country and donor must understand the needs of targeted sections of the rural population and design such voucher schemes to meet the needs of the targeted population. These programs must be combined with safety nets for the most disadvantaged members of rural societies and other development requirements. Program flexibility is required to allow for drought effects, which again should be targeted. Most importantly, clearly defined adequate time horizons need to be publicized from the start in order to minimize uncertainty and encourage active participation. This requires long-term commitment from governments and donors.

Annex 1 provides a draft strategy developed for Malawi in 2005 that illustrates the holistic activities recommended in addition to a voucher program. The estimated cost of this proposal was \$211 million over 10 years. The possible solutions do not come cheaply, but the cost of inaction will be catastrophic.

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Table 1. Pro-Poor Fertilizer Market Development Strategies for Food Crops

	Conditions								Strategies						
	Nutrient Depletion	Poverty Level	Food Insecurity	Fertilizer Response	Fertilizer Availability	Fertilizer Price	Output Market	Output Prices	Cash Payment Security Net	Food Aid	Voucher Subsidy	Voucher Credit	Demand Stimulation	Supply Stimulation	
Stage I	H	H	H	Y	N	H	Limited	Low	Y	N	Y	N	Y	Y	
				N	N	H	Limited	Low	Y	Y	N	N	Research	N	
Stage II	M	H	H	Y	Limited	H	Limited	Low	N	N	Y	N	Y	Y	
				N	Medium	H	Identified	High	N	N	N	Y	Y	Y	
				N	Limited	H	Limited	Low	Y	Y	N	N	Research	N	
Stage III	M	H	M	Y	Y	M	Identified	High	N	N	N	Y	Y		
				N	Y	M	Identified	Medium	N	N	N	N	Research	N	
Post Emergency	H and M	H	H	Y	Y	H	Limited	High	Y	N	Y short term	Y med. term	Y	Y	
				N	Y	H	Limited	High	Y	Y	N	N	Research		
				Y	N	H	Limited	High	Y	N	Y	Y	N	Research	Y
				N	Y	H	Limited	High	Y	Y	Y	N	Research		

Stage 1: Non-existent input markets. Farmers retain own seed or exchange seed of poor quality and rely on manure, crop residues, and burning to maintain soil fertility.

Stage II: Emergence: Input markets emerge especially for export crops with both public and private input distribution. Food crop production mainly from farmer-retained seed.

Stage II: Growth: Food crops are increasingly commercialized. Modern seed, mineral fertilizer, and pesticide markets develop with the private sector dominating and government withdrawing to a regulatory and policy role. Financial services increasingly available, but informal financial arrangements remain dominant.

Demand Stimulation: Technology adoption programs designed to stimulate farmer demand including participatory learning, producer associations, research and extension, and accessibility to credit.

Supply Stimulation: Programs to increase the accessibility, affordability and quality of inputs embodied in the five pillars of input market development.

Output Market Development: Programs to increase the efficiency of output markets including warehouse credit schemes, producer group marketing, improved linkages and market information.

H- High; M - Medium; Y - yes; N - No.

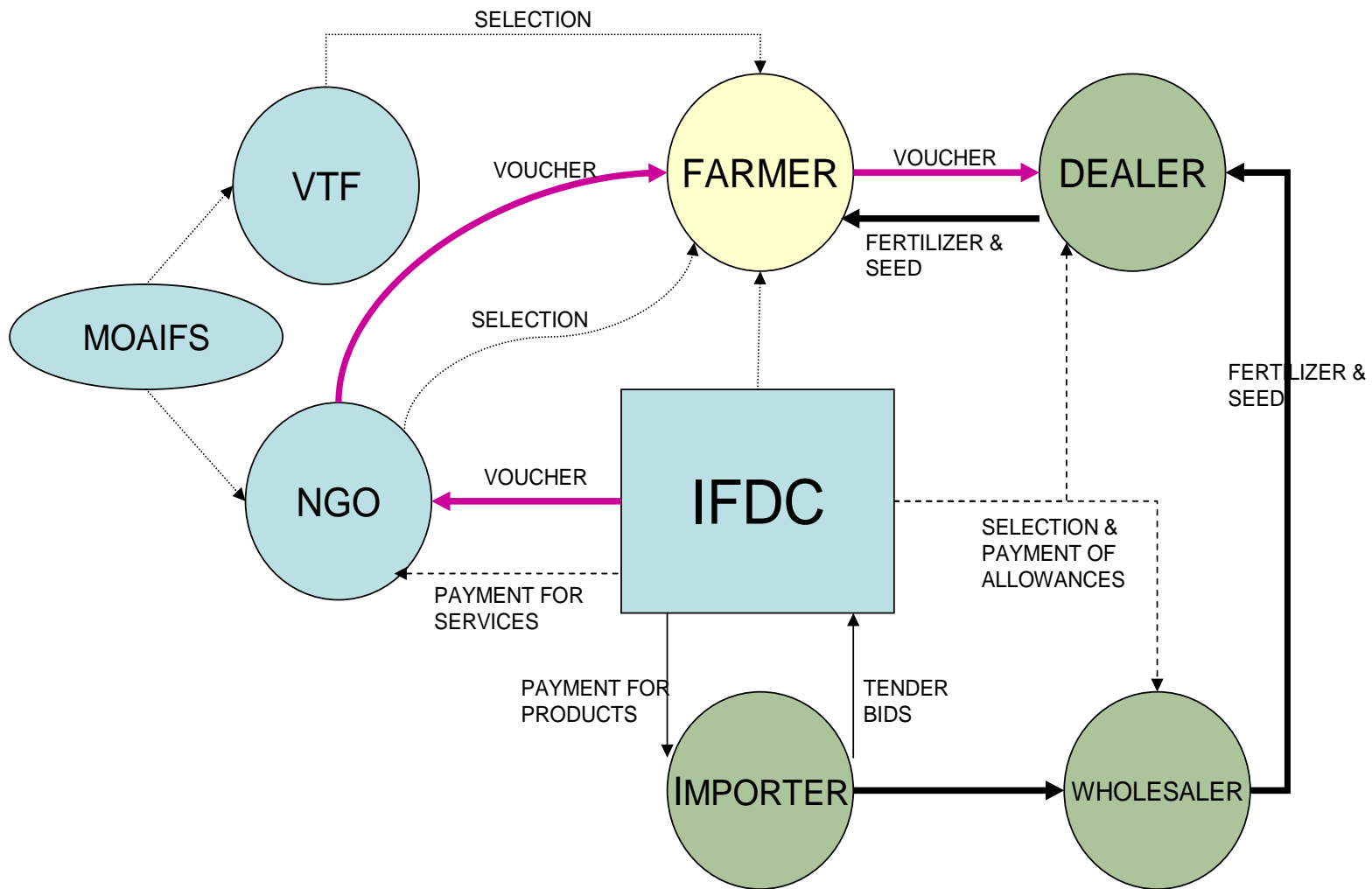
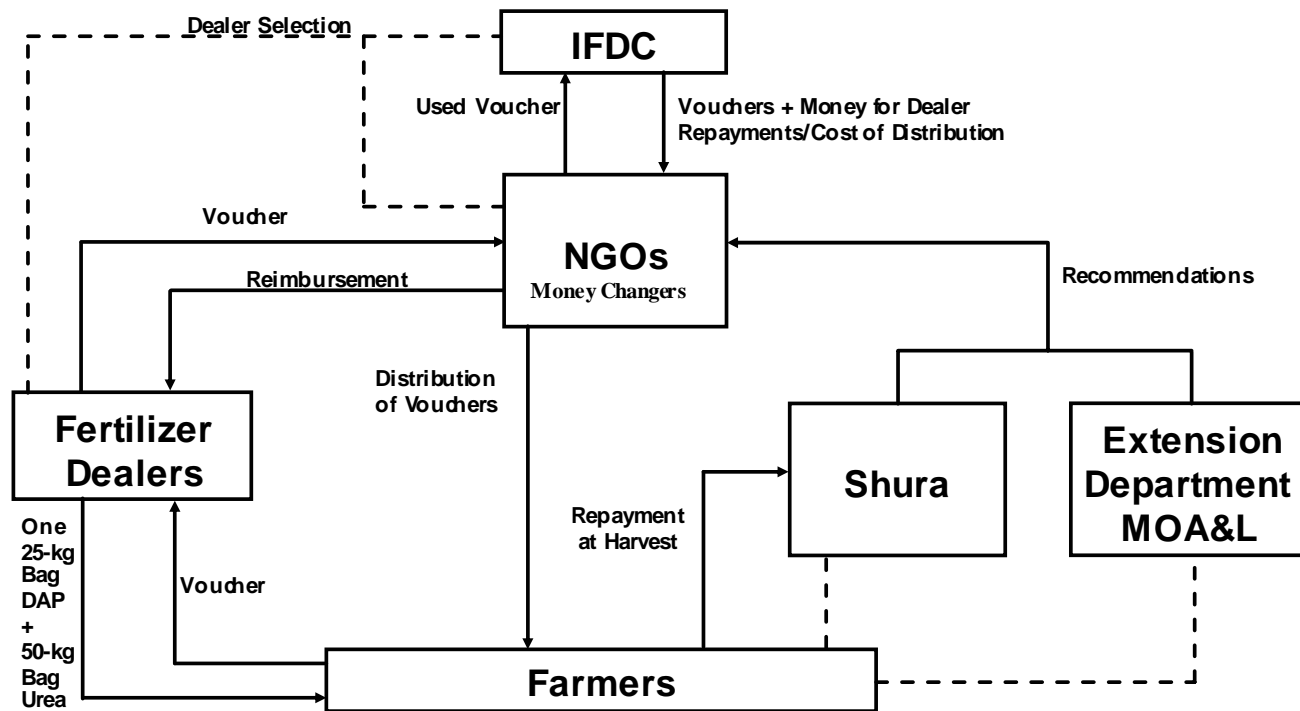


Figure 1. The SPLIFA Voucher System in Malawi



**Figure 2. IFDC Afghanistan – 2002 Fall Wheat Fertilizer Distribution Plan
(3,900 tons DAP and 7,800 tons urea)**

Annex 1.
Addressing Hunger and Poverty in Malawi

**The Private/Public Sector Partnership to End the Poverty Trap for
Smallholder Farmers**



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June 2005

The Private/Public Sector Partnership to End the Poverty Trap for Smallholder Farmers in Malawi

The Proposed Private Sector Development Plan and Milestones

Seven major initiatives are proposed for implementation over the next 10 years that will address the main objectives of overcoming hunger for smallholder farmers and reducing poverty. These are:

- Subsidized input availability for 2.8 million smallholder families for a clearly defined timeline implemented through the private sector.
- Private sector capacity building and institutional development.
- Public sector capacity building in agricultural extension and research.
- Implementation of new agri-input legislation and enforcement.
- Development of a national MIS/GIS system through a public/private partnership.
- Sequential establishment of best-bet production strategies including crop diversification, environmentally sustainable farm management systems to restore soil fertility, and labor-reducing crop production systems for HIV/AIDS affected families.
- Sequential improvements to local, national, and regional food crop marketing.
- Development of regional and local transportation cost-reducing investments.

Inputs Income Support

Smallholder farmers are for the most part unable to purchase inputs because they are too poor. Practical problems associated with targeting smallholder farmers for subsidized inputs are recognized as creating social disharmony. It is therefore proposed to supply all Malawian smallholder farmers with sufficient agri-inputs for 0.4 ha of maize. An estimated 10% non-requirement will be offset by the reduced cost of not targeting.

The private sector importers currently procure between 220,000 and 250,000 tons fertilizers per year. To supply 2.8 million households with 50 kg of basal fertilizer and 50 kg of urea for 0.4 ha per household will require 112,000 tons fertilizers. This quantity is within the current capacity of the private-sector procurement and distribution network. The selection of 50 kg bags rather than small packs eliminates the need for repackaging fertilizer. The nutrient application rate for 0.4 ha depends on the choice of basal fertilizer. Using 23-21-0 the total nutrient application rate in kilograms per hectare would be 82 N and 26 P₂O₅ and for a basal fertilizer analysis of 5-20-10, the rates would be 64 N, 25 P₂O₅ and 12.5 K₂O. The latter is recommended based on established potash deficiency throughout the maize production areas.

The GoM procured Traditional Irrigation and Environmental Development Program (TIP) fertilizer for 2005 through the Small Holder Farmers Fertilizer Revolving Fund of Malawi (SFFRFM) and distributed it through ADMARC. This was extremely detrimental to the development of the private sector, particularly the smaller dealers who comprise

the membership of AISAM. The GoM has no comparative advantage in procuring fertilizer on the international market. The cost to the GoM of handling procurement would probably exceed the 23% finance cost and margin of the private sector. It is proposed that the GoM should no longer participate in fertilizer procurement or marketing.

The fertilizer rate recommended is suitable for the yield potential of hybrid varieties but would be wasteful if used with OPV and local varieties. The current capacity for hybrid production is sufficient for approximately 500,000 ha. It is estimated that it will take 2 years to reach the required production level for the program. Meanwhile the additional hybrid seed supplies should be procured regionally.

It is proposed that vouchers should be distributed to all households by the Joint Emergency Food Aid Program (JEFAP), an NGO consortium. Statistics on smallholder households at the district level will enable an accurate estimate of sales to be obtained well in advance of requirements. The total and district level requirements will be agreed on by May of each year to provide sufficient lead time for procurement. The GoM will make sufficient foreign exchange available through the Central Bank of Malawi to meet import requirements by the private sector. Farmers will cash in the vouchers for the input packages of seed and fertilizer at agri-input dealers of their choice. Dealers will supply technical information on crop management and seed and fertilizer use to all smallholder farmers. The project in conjunction with the extension service will supply dealers with straightforward recommendations in the local language or with pictograms. It is also proposed that the project, in addition to dealer-sponsored field demonstrations, will engage in technology transfer activities at the farm-level by implementing ISFM techniques to teach farmers the correct use of inputs in conjunction with soil amendments like compost and organic manure. One ISFM village in each of the three regions is initially proposed.

It is proposed that quantities of program-supported fertilizer and seed quantities are fixed for a 2-year period and that the GoM pay private sector fertilizer importers at a tendered, landed price at Lilongwe and other major distribution centers. Dealers will pay for their own transport costs from the distribution centers to their retail stores and provide the package quantities in exchange for vouchers from smallholder farmers. Dealers will cash in the vouchers for verification to the project staff and be compensated at a fixed margin plus verified local transport cost. From year three dealers will pay importers 25% of the distribution center landed costs and the GoM payment to importers will be reduced to 75% of the landed costs. In year four it is proposed to increase the dealer payment to 50% and in year five to 75%. In year six the dealers will pay 100% to the importers. This sequential process is designed to allow the retail dealers to use their own funds and increased access to credit. This activity builds, maintains, and strengthens ties between the private sector actors along the supply chain. It also builds a culture of repayment and credit management.

After 2 years the value of the vouchers will be reduced to 75% of the retail market price, and in subsequent years to 50% and 25%, so that by year six no vouchers will be

available for maize seed or fertilizer. Over a period of 5 years, there will be the opportunity for smallholder farmers to establish (a) relationships with input dealers and (b) increase maize production by up to 100%.

As production increases on smallholder farms the introduction of vouchers for other crops can be introduced from year 3 onwards.

It is not recommended that vouchers be issued for work programs. However, it is recommended, based on the findings of the SPLIFA program, that during the first 2 years, there should be NGO work programs for cash with work programs based on village road improvements first and later on a coordinated village-level crop storage program. The use of cash for work programs will overcome any tendency to sell subsidized inputs for cash especially in border regions.

Private-Sector Capacity Building

1. Strengthen the Structure, Ensure the Sustainability, and Consolidate the Strategic Position of AISAM

- a. Consolidating the structure of the organization as a single national body with district-level delegations, a solid executive secretariat, and proactive internal committees actively engaged in the achievement of clearly defined goals.
- b. Work to merge the AISAM and Rural Agricultural Market Development Trust (RUMARK) associations into one sustainable trade association by the end of year 1.
- c. Ensuring the sustainability of AISAM, recognizing that sustainability is a function of financial self-reliance, maximization of membership benefits, and the extent to which AISAM contributes to the policy environment and the national economy.
- d. Differentiating AISAM agri-input dealers as a cadre of highly trained and proactive entrepreneurs that provide value to their customers by stocking good-quality products, distributing them in the right packages at competitive prices and in a timely fashion, and by providing sound technical advice.

2. Establish Importers Association

Provide technical assistance to the major fertilizer importing firms to form a sustainable trade association to represent their interests through advocacy, communication and education during year 1. No financial assistance is proposed for this development, but training will be provided in advocacy capacity building over 3 years.

3. Support Crop Life Malawi

Provide technical assistance to Crop Life Malawi to coordinate training of agri-input dealers.

4. Support Seed Trade Association of Malawi (STAM)

Provide technical assistance to STAM to coordinate training of agri-input dealers.

5. Capacity Building in Bank System to Facilitate Credit to Private Sector

Provide training to financial system on credit requirements for agri-input importers, distributors, and dealers. Set targets for credit applications and approvals.

Public-Sector Capacity Building to Compliment Private-Sector Development

1. Include Extension Service in Dealer Training, Field Days, etc.

Training of AISAM dealers at the district level will be open to all extension agents of the MoA and utilize the services of Extension Service specialists for technical topics on crop production and Crop Life Malawi and STAM personnel on crop protection product (CPP) and seed technology and marketing.

2. Work With MoA and IARC Research Centers on Developing ISFM for Malawi

ISFM is a participatory learning tool for farmer groups developed in West Africa by IFDC. It incorporates techniques that allow farmer sub-groups within a village to try different ways to improve crop production. Such techniques as changed planting practices, incorporating available organic matter together with inorganic fertilizers, and water harvesting are selected by sub-groups, and the results obtained by each sub-group are discussed with the total group. Over 100,000 farmers in six countries in West Africa have participated in this process over the past 4 years with very positive results. By combining organic matter incorporation or other locally available soil amendments, fertilizer use efficiency improved, value:cost ratios were well over 2, returns to family labor are 2 to 6 times higher than average salaries, and farm level incomes have increased by 20% to 50%.

It is proposed to bring specialist staff from West Africa to train trainers in Malawi on these participatory learning techniques and together with research center specialists develop alternative crop production technologies for farmer testing. It is also proposed to establish one village center in each of the 3 regions in year 1 and increase the number to 27, one in each district.

3. Agri-Input Regulation Implementation

New agri-input laws and regulations have been jointly developed by IFDC and the GoM. These are now ready for presentation to parliament for ratification. It is proposed to provide technical assistance to the GoM to implement the fertilizer

regulations through the production of manuals and regulatory handbooks and the training of inspectors. A budget is also included for capital investment in a fertilizer regulatory laboratory.

Additional training will be required for CPP and seed regulation implementation.

Market Information and Geographic Information System Development

1. Expand MIS/GIS with private-sector support for information dissemination.
The IFDC developed MIS/GIS system requires further development and commercialization. It is designed for AISAM, the importers, and farmers. Market information is reported from all 27 districts by AISAM and information is disseminated by newsletter and weekly radio programs. The radio programs will be increased to four per week and costs will be supplemented by private-sector sponsorship and advertising. The GIS system records and displays information on the dealer network throughout Malawi.
2. Develop crop modeling application to GIS system to test best-bet production strategies.
It is proposed to use IFDC specialists to incorporate crop model data bases into the GIS system, improve the user interface, and develop crop production strategies to optimize recommendations by agro-ecological areas.
3. Incorporate smallholder household data into data base.
It is proposed to incorporate the smallholder household data from the GoM statistics bureau and from the annual survey data to provide the linkages between dealers and smallholder farmers.

Technology

1. **Implement an ISFM village in each of the 27 districts**
It is proposed to establish 3 ISFM villages, one per region in year 1 and expand these to 27 villages by year 9 as major technology development and transfer centers.
2. **Introduce crop diversification and drought resistant staples.**
It is proposed to work with the NARCs and the IARCs and seed companies to develop vegetable production, other staple crop diversification, and introduce drought resistant varieties over years 3 to 10. A supplementary voucher scheme to reduce adoption risk will be introduced in year 3.
3. **Introduction of technologies requiring less labor for HIV/AIDS afflicted populations**
The reduced labor availability in populations living with HIV/AIDS is a major problem in Malawi. It is proposed that through AISAM, the project will work

with the NARCs and IARCs and extension service to introduce the following technologies through the ISFM villages:

- Conservation tillage.
- Herbicides.
- Intercropping.
- Pit-farming.
- Early ploughing or manual cultivation (March and April rather than in the dry harsh conditions of September and October).
- The application of soil conservation and soil moisture conservation techniques.

Crop Marketing

1. Assist private sector in crop marketing role at village and district levels

As crop production is increased, smallholder farmers will have three options available to them: sell some marketable surplus and/or reduce areas of staple crops and replace with legumes or vegetable crops. Selling marketable surplus is unlikely to happen in most areas for at least 2 years. By year 3 it is anticipated that in some districts there will be a growing marketing problem. Some private sector dealers may choose to have a role in crop marketing either as collection and consolidation enterprises or a more developed role. These activities will require increased credit, investment, management skills, and market information. Training and facilitation to information on crop marketing is proposed as a follow-up activity within the project for agri-input dealers.

2. Introduce grain banks from year 3 onward in most productive areas

The use of grain banks in Kenya is proving to be a very satisfactory means for smallholder farmers to avoid the collapse of grain prices at harvest time and having to pay high prices. Farmers sell grain to the grain banks at harvest time and receive a small cash payment to allow them to meet immediate expenses. During food deficit periods their grain deposits can be withdrawn from the grain banks less the interest charges and cash advances. Consideration may be given by the GoM as to whether such grain bank operations should be either public or private sector.

3. Increase market information

It is proposed to work with the MoA to improve the MIS for crop markets during the period from year 3 to year 10.

Policy Analysis and Dialogue

It is proposed that the project should maintain a policy analysis unit to assist the private sector in advocacy on agri-inputs with the GoM. Four major areas of intervention are foreseen: transportation costs, regional trade, privatization of state-owned enterprises, and infrastructure investment.

The high cost of land transportation into Malawi for fertilizers is a significant cost that can be reduced through improved efficiency of the rail link from Nacala, improvement in other transport corridors, and investment in local road maintenance.

For both inputs and crop marketing, significant cost savings may be achieved through harmonization of regional trade.

Privatization of ADMARC is seen as a priority to rationalize crop marketing as domestic maize production increases and there is less need for strategic grain reserves. Careful cost benefit analysis is recommended as part of the policy component of the project.

The GoM needs to commit further investment in transport infrastructure and develop a medium-term plan to commit to such investment in support of private-sector business development and cost reduction. Over the proposed lifetime of this project, increased revenues from the private sector and less costs for food importation should generate increased investment funds.

Budget

A detailed budget for year 1 was prepared together with an estimated 10 year summary. These budgets include four components:

1. Implementation costs for technical assistance.
2. Fertilizer income support costs based on 56,000 tons of both basal and urea fertilizer per year for 2 years and subsequently reducing quantities for a further 3 years.
3. Voucher distribution costs.
4. Cash support for 2 years based on \$5.00 per smallholder family for 2.8 million households.

It should be noted that this budget does **not** include the cost of seed income support costs.

The total budget over 10 years is estimated at US \$210.9 million but will vary depending on the international price of fertilizer. The average implementation cost is US \$2.8 million per year. The income support cost is US \$139 million over 5 years (including crop diversification programs) and the voucher distribution costs for NGOs are estimated at US \$15 million over 6 years.

A supplementary cash income support is budgeted to cost US \$28 million over the first 2 years.