Emerging from the worst harvest in a decade, the Government of Malawi implemented one of the most ambitious and successful assaults on hunger in the history of the African continent. Through a national input subsidy program, coinciding with better rainfall conditions, maize production doubled in 2006 and almost tripled in 2007 and 2008. From a 43% national food deficit in 2005, Malawi achieved 53% and 58% maize surpluses in 2007 and 2008 respectively, with some being exported to neighbouring countries. An associated decline in the price of maize conveys important benefits to low-income urban and rural households that are net food consumers. Malawi's four years of experience in implementing input voucher subsidies may provide important lessons for achieving food security through smallholders in Africa.

Agricultural productivity improvements have long been viewed as the foundation for economic prosperity and social development in Africa though little investments have been made in the sector in the last four decades. Asia's Green Revolution began in the 1960s with the development of fertilizer-responsive, high-yielding varieties of rice and wheat. Asia's average yields of these staple crops more than doubled over this period with greatest impact in regions with irrigation or more reliable rainfall. Improved access to fertilizer through state-supported subsidies, rural credit, and improved infrastructure contributed to strong productivity growth in both crops.

Asian governments also supported the uptake of new technology through research and extension, and intervened in the market through price support. In contrast, agricultural productivity growth in sub-Saharan Africa has not kept pace with population growth. The per capita growth rate of agricultural gross domestic product was negative during the 1980s and 1990s, though improvements have been noted since 2000. Production growth of the major African food crops (maize and root crops) was based almost entirely on extending the cultivated area, with only minor contributions from yield growth. Poor infrastructure and related high transport costs (for both inputs and surplus production), inadequate institutional support (credit and extension), political instability, diverse agro ecological complexities, low fertilizer use, and the limited availability of suitable high-yielding varieties have all contributed to low agricultural productivity growth in Africa.

The slower productivity growth in Africa compared with Asia masks a number of limited successes that could point to a latent African Green Revolution. Recognizing the role of agriculture in stimulating economic growth and reducing rural poverty, African governments promoted fertilizer use during the 1970s and early 1980s through several interventions, including direct subsidies that reduced fertilizer prices for farmers, government-financed and -managed input credit programs, centralized fertilizer procurement and distribution, and control of output markets.

Impressive improvements in maize productivity were demonstrated in Kenya, Zimbabwe, and Zambia during the 1980s. Cereal crop output in Ethiopia had dramatically increased over the past decade. Several other
studies have shown the potential of input subsidies in accelerating crop production. However, these positive results were generally not sustained with the advent of donor-driven structural adjustment and the dismantling of government-supported institutions and subsidies.

By the turn of the century, fertilizer use in Africa was only 8 kg/ha, compared with 96 kg/ha in East and Southeast Asia and 101 kg/ha in South Asia. Today, Africa accounts for less than 1% of global fertilizer consumption. A World Bank synthesis of lessons learned from earlier efforts to promote fertilizer use on the continent attributed this failure to high and unsustainable fiscal and administrative costs, governments’ weak capacity to implement programs, and governments’ inability to take account of the diversity of production systems and farmers’ needs.

Donors, led by the World Bank, argued for the abolition of state-led interventions including subsidies. As a result, many government input supply agencies were dissolved or privatized. Under these circumstances, fertilizer costs rose sharply and constrained adoption of fertilizer use by small-scale farmers. The World Bank study concluded that “although these reforms had generated positive impacts on government budgets, they resulted in significant reductions in overall levels of fertilizer use and increased food insecurity among many rural households”. This policy failure caused a serious reassessment among governments, creating the setting for a return to subsidies as a potential intervention for promoting food security and agricultural growth.

In Malawi, recent success with input subsidies highlights how pro-poor public investments in maize productivity improvement can be made cost-effectively. FANRPAN research shows that input subsidies work. Over the term of the programme, average maize yields for smallholder farmers in Malawi have increased from 0.8 tonnes/hectare to 2.9 tonnes/hectare, transforming Malawi from a food deficit nation to a grain exporter. This food security has contributed to reduction of malnutrition cases of children under five from 30% to 2.5% in 2008/09 and the number of people below the poverty line has declined from 50% in 2005 to 42% in 2008. Malawi’s grain exports also impacted food security in the southern African region as a whole by contributing to lower food prices.

Perhaps more surprisingly, FANRPAN research shows that input subsidies are cost-effective. Contrary to the arguments that government subsidies would worsen the budget deficit and distort the markets, Malawi’s voucher programme has had a net positive impact on the country’s bottom line. It has more than paid for itself by reducing Malawi’s expenditure on food imports.

Subsidy Impact on Food Security and Livelihoods
The 2006-2007 harvest was estimated at 3.44 million t, an all-time national record for Malawi, generating a surplus of about 1.34 million t of maize grain above national requirements, however the 2008-09 harvest has even been more abundant with 3.7million t indicating progress every subsequent year. The incremental effect of the fertilizer subsidy on maize production was estimated at 670,000 t for 2006-2007, valued at US$117 million in additional crop production, assuming a maize producer price of US$175/t. The total program cost in 2006-2007 was US$72 million, approximately US$62 million of which was directed to maize fertilizer and seed costs. By late 2007, Malawi had exported over 300,000 t of maize to Zimbabwe, not only generating income for its smallholder farmers, but contributing to regional food security. Malawi’s revenue from maize surplus has been in excess of US$140 million combined export and WFP purchase for progress programme.

These results suggest that the maize consumers in Malawi have benefited from the four successive strong harvests and the related price declines for the maize consumers.

Similar benefits were seen in Zambia and Mozambique through the Fertilizer Support Programme (FSP) and Input Trade Fairs Programme (ITFS) respectively. In Zambia, farmers that had access to fertilizer support registered surplus production and had higher quantities to sell translating to higher household asset values. In Mozambique, maize yields for those who had access to Input Trade Fair vouchers increased from an average of 0.7mt /ha to an average of 2.0mt/ha. This increase resulted in increased trade of surplus.

This outcome is fully consistent with experience in Asia and suggests an important potential impact of seed and fertilizer subsidies on food security for the poorest households that are net consumers even after good harvests.

Lessons Learned from Malawi Input Voucher
Political will and action provide the foundation for change
Political leadership has effectively buffered Malawi from the economically and socially destructive effects of the global food price increases of 2007 and 2008. Carryover stocks have meant that Malawi is no longer dependent on food aid and costly commercial imports. Importantly, Malawi is now the focus of international attention as a result of some high-profile coverage in the international press. Initially with some reluctance, but with increasing interest and engagement, several donors have begun to work with the Government to support and improve the effectiveness of the input subsidy program for smallholders.

Yield Potential
Despite maize seed varieties having yield potential of 6 to 8 mt/ha farmers have only managed to reach an average of 2.9mt/ha in each of the three countries indicating that there is need to investigate why the yield gap and limitations that cause it. Issues could be in two categories:

(i) Bio Physical Limitations
- Soil fertility
- Water
- Germplasm

(ii) Socio Economic and Policy
- Knowledge
- Credit availability
- Efficient Input and output market access
- Policy

Could differences in farmer productive asset base and differences in agronomic practices make an impact? Understanding these would help extension workers to have focused messages.

Knowledge exists to increase smallholder maize productivity and sharply reduce food insecurity
The interventions implemented are straightforward practices that were developed by Malawian researchers and their international partners. The central biological basis for productivity improvement is the response of maize to nitrogen fertilizer application.

The widespread occurrence of nitrogen deficiency in Africa and the availability of well adapted maize varieties, both hybrids and OPVs mean that Malawi’s experience is relevant beyond its borders. Importantly, these improved practices have been successfully applied by smallholders, suggesting that development of large-scale commercial farming may not be essential for the achievement of national or household food security in Africa.

The cost of achieving food security is fiscally manageable and responsible
The budgetary allocation, representing less than 7% of the 2005-2006 national budget (US$5/person/year), supplemented in 2006-2007 by donor support (less than US$1/person/year), is a remarkably small price to pay for achieving national food self-sufficiency and widespread household food security. By comparison, the cost of importing food in 2004-2005 was US$110 million (about US$8 per person). Donor aid to Malawi in 2005 was US$578 million or about US$44 per person On this basis, there should be little concern about the affordability of a program that has such profound and immediate impact on the lives of so many Malawians. Moreover, the export of surplus maize to Zimbabwe in 2007-2008 and WFP Purchase for Progress (P4P) local purchases has generated over US$140 million.

RECOMMENDATIONS
After decades of food insecurity and recurring emergencies, the Government of Malawi has successfully implemented a national input subsidy program that led to major surpluses above national demand in four successive years. Drawing on their core resources—land and labour—and with a determination to be self-reliant and free of food aid, Malawian smallholders demonstrated that they have the ability to respond to strategic material support and incentives in order to contribute to their own well-being.

There is a clear need to invest more resources in:
- Research and extension. This will help improve fertilizer use efficiency and therefore improve on yield response.
- Agro dealer network development for efficient input distribution and extension complementarities.
- Promotion of new technologies.
- Grain storage to reduce post harvest losses.
- Improvement on beneficiary targeting, introduction of household Vulnerability Index tool (FHVI) would help targeting and decisions on what kind of interventions to administer.
- Developing a framework that facilitates monitoring of farmer progress.
- Solutions are still needed to address the risks of drought and dry spells, both through land and water management technologies.
Malawi has led the way in Africa in demonstrating the opportunities and challenges of implementing a national input subsidy program. With the impetus of recent high food prices and a softening of donor opposition to subsidies, several of Malawi’s neighbours (including Kenya, Rwanda, Tanzania, Zambia, and Mozambique among others) are now studying, adapting, and building on this experience to design and implement similar programs for improving agricultural productivity. Malawi’s experience will continue to provide valuable lessons for achieving and sustaining Africa’s Green Revolution.

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Farmer Testimony: Mr Jestala; In 2005, more than 30 of his neighbours died of malnutrition in one of the periodic droughts that had swept Southern Africa. Even in a good year, he told the UK newspaper The Independent, he could harvest barely 250 kilograms of maize from his exhausted land. But over the past two years his harvest has tripled, producing plenty of food for his family and leaving more than enough to sell at the local market.

The difference, Mr Jestala says, is fertilizer. For years this basic input was simply beyond his means and those of millions of other African farmers. Costing the equivalent of about $50 a bag, fertilizer was just too expensive to use. And buying it on credit was too great a risk for farmers at the mercy of unreliable rains and poor-quality seeds. But in 2005 the government of President Bingu wa Mutharika began subsidizing fertilizers and high-yielding seeds for Malawi’s smallholders. The action to cut fertilizer prices by 80 per cent and slash the cost of hybrid maize seeds from 600 kwacha per bag to 30 (Africa Renewal Vol 22 No. 3 Oct 2008) helped to increase improved fertilizer and seed uptake.

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The Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) is an autonomous regional stakeholder driven policy research, analysis and implementation network that was formally established in the Southern Africa Development Community (SADC) in 1997. FANRPAN was borne out of the need by SADC governments who felt that comprehensive policies and strategies were required to inform regional integration. FANRPAN is mandated to work in all SADC countries and currently has activities in 13 Southern African countries namely Angola, Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.