Graduate School of Development Studies

The myth of Malawi's food self-sufficiency — enough food for everyone?

Implication of policy and food entitlement in household food security of rural Malawi

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List of Acronyms

ADMARC	Agricultural Development and Marketing Corporation
AISS	Agricultural Input Subsidy Survey
CPI	Consumer Price Index
EPA	Extension Planning Area
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	The FAO Statistical Database
FEWSNET	Famine Early Warning System Network
IFPRI	International Food Policy Research Institute
IHS2	Integrated Household Survey (2004/2005)
IMF	International Monetary Fund
IRIN	The humanitarian news and analysis service of the UN Office for the Coordination of Humanitarian Affairs
MK	Malawi Kwacha (MK115 and MK140 to the US$ as of 2005 and 2008 respectively)
NFRA	National Food Reserve Agency
NSO	National Statistical Office
SALs	Structural Adjustment Loans
SAP	Structural Adjustment Programme
SFFRFM	Smallholder Farmers Fertiliser Revolving Fund of Malawi
SGR	Strategic Grain Reserve
TIP	Targeted Inputs Programme
VCR	Value Cost Ratio
WDI	World Development Indicators
WFP	World Food Programme

INTRODUCTION

Today, more than half of the population in Malawi are assumed to be food insecure (Harrigan, 2007). Although recent bumper maize [1] harvests have achieved national aggregate food security, large number of population is still food insecure (IRIN, April 2008). Besides, year to year production quantity of maize has been unstable (FAOSTAT, 2008), due to unpredictable weather such as drought and floods, combined with varying availability and affordability of fertilisers to smallholders which have been largely determined by the government policy on subsidies.

Since its independence in 1964 until the present, Malawi has been pursuing a food policy aiming at national food self-sufficiency. However, how far the policy has been addressing the issue of household food security – "*assured access to food at all times to all citizens*"? What have been the contributors to prevailing unequal access to food? Why a bumper harvest does not secure food for all?

This paper is going to analyse contributing factors to household food insecurity in Malawi, and how the government policies have been influencing them, as well as inter-relationships between those micro and macro factors. The research focus is on food policy including trade liberalisation and market intervention policies as macro factors while looking at food entitlements of rural households as micro factors.

The main research question is:

> How have food entitlements of rural households in Malawi been influenced by price changes brought by various food policies and external factors?

Chapter 1 will introduce basic concepts to understand food security such as food entitlements, national food security and household food security. Then a framework to analyse inter-relationships between micro and macro factors of food security – policies and macro-economic environment on the one hand, and food entitlements of rural households on the other hand – will be presented.

Chapter 2 will discuss what has been the impact of policies on food security, such as trade liberalisation policy and market intervention policy and their influence on prices of food and agricultural inputs will be discussed.

Chapter 3 will present an empirical analysis, showing that household food security in rural Malawi could be described as a function of cash income rather than other factors of food production. In the process of presenting this

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[1] In this paper, particularly maize is receiving focus in the discussion of food security, since maize is a dominant food staple based on calorie intake in Malawi. The share of maize in the daily cereal calorie intake per capita is 90 per cent (1153kcal) in Malawi (FAOSTAT, data as of 2003).

argument, current food security situation in Malawi in terms of individual access to food will be analysed in detail. The analysis will be based on a national household survey and a household survey by Lobi Extension Planning Area (EPA) in Dedza District[2].

Chapter 4 will interconnect the analyses in preceding chapters, connecting policies and food entitlements of rural households. In the process, firstly, it will discuss how the policy changes and resulting price fluctuations have been influencing both aggregate food availability and individual access to food. Current food security situation in Malawi in terms of aggregate food availability will be presented in this discussion, showing data based on FAO statistics. Secondly, the discussion will be extended to examine how such price changes have been facilitating and influencing rural differentiation and food entitlements of rural households differently reflecting their heterogeneity.

Finally, a conclusion will be drawn from these analyses suggesting that household income, "cash" in particular, plays an important role in the current context of household food security in rural Malawi; therefore the changes in macro-economic environment influenced by the policies have been some of the most important contributing factors to the prevailing food insecurity at household level in rural Malawi.

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[2] Extension Planning Area (EPA) is the smallest unit of agricultural extension by the Ministry of Agriculture and Food Security (MoAFS). Several EPAs are allocated in a District, and supervised by a District agricultural office called Rural Development Project (RDP). RDPs are supervised by regional agricultural offices called Agricultural Development Division (ADD) directly supervised by MoAFS where the country in divided into 8 regions.

Chapter 1
THEORETICAL FRAMEWORK

1.1   Household food security and National food security

Food security is defined as "assured physical and economic access to food, at all times, to all citizens" (Streeten, 1987). The causes of food insecurity range from domestic to international factors. Domestic factors refer to unequal distribution of food, land and other assets to produce food. International factors represent macro changes in economic environment and policies which influence food availability as well as access to food.

Food security is distinguished between household food security and national food security. Household food insecurity is "the inability to acquire – through production, purchase and transfers – sufficient food for a healthy, active life" (Devereux, 1997). Household food security can be achieved by own production or earning cash income to purchase food in the markets, or both of them. In addition, a social safety net could compensate failure of these means. On the other hand, national food security is aggregate food security where food quantity required for the total population is available in domestic food markets. It can be achieved by domestic food production i.e. food self-sufficiency or earning foreign exchange to import food i.e. trade-based food security or combination of the two.

National food security and household food security are not necessarily achieved at the same time. In a good harvest year, even if there is enough food available in domestic markets, a household may remain with no access to food due to lack of cash to purchase it. As well, in a bad harvest year, even if there is a scarcity of food in domestic markets, some groups of people can be food secure since they have enough cash to buy expensive food or enough land to compensate low yield of reduced production.

Food entitlements
At micro level, food entitlement is an important concept to understand household food security. According to the entitlement approach introduced by Amartya Sen (1990):

> "The entitlement of a person stands for the set of different alternative commodity bundles that the person can acquire through use of the various legal channels of acquirement open to someone in his position. [...] the entitlement set of a person is determined by his original bundle of ownership (what is called his 'endowment') and the various alternative bundles he can acquire starting respectively from each initial endowment, through the use of trade and production" (Amartya Sen, 1990:36-37).

Here, examples of endowments of an individual household (i.e. original bundle of ownership) are land possessed by a household and its family labour. On the other hand, what can be obtained by exchanging some of these initial endowments or in exchange of commodities produced by using such initial endowments are here called "the various alternative bundles". In other words, commodities including food, both obtained by own production and trading are described as "the various alternative bundle", since they are not initially endowed to a household. In this context, cash could be described as a mean of exchanging commodities. However, in this paper, the concept of "endowment" of a household is extended to include cash obtained through various sources as well as hired labour and land purchased or rented-in. Namely, all types of capital possessed by a household and used for production or trading will be described as its "endowments".

Sen (1990) also illustrates relationships between entitlements and individual food security:

> "A person has to starve if his entitlement set does not include any commodity bundle with enough food. A person is reduced to starvation if some change either in his endowment (e.g., alienation of land, or loss of labour power due to ill health), or in his exchange entitlement mapping (e.g., fall in wages, rise in food prices, loss of employment, drop in the price of the goods he produces and sells), makes it no longer possible for him to acquire any commodity bundle with enough food" (ibid.).

Thus, direct food entitlement refers to what a person can consume from his or her own production, by using his or her endowment for food production (i.e. land, labour, agricultural inputs or cash/credit to acquire inputs). On the other hand, exchange food entitlement is what a person can purchase in markets by exchanging his or her endowment for food purchase (i.e. cash from various sources such as; from food crops, cash crops, off-farm income, wage labour, credit and remittances). Individual household needs either "endowment for food production" or "endowment for food purchase" in order to ensure direct food entitlement and exchange food entitlement respectively. If an individual household has insufficient food production for own consumption, a combination of direct food entitlement and exchange food entitlement must be ensured for its food security.

1.2 A framework to connect macro and micro factors

Figure 1 shows a framework to understand how food entitlements of a household, household food security and national food security are related and influencing each other. The framework is based on market transaction of food crops and cash flow from various income sources of a household.

First of all, food security of a household can be achieved by securing either own produced food or purchased food or a combination of them. In order to produce food, a household needs endowment for food production e.g. land, labour and agricultural inputs. On the other hand, to purchase food in the market, a household requires endowment for food exchange i.e. cash income.

A household may also acquire food in exchange of its labour, for instance, through working as agricultural wage labour and receiving wage in-kind i.e. food staples. When a household fails to secure food from these sources, food aid and food remittances are important[3].

Secondly, a household requires cash income for both food expenditure and non-food expenditure. If a household does not have other cash income sources, sales from food become a major source of cash income. On the other hand, if a household has diversified income sources, there can be options whether to sell own produced food for cash income or keep it for own consumption. In order to have diversified income sources, a household needs endowment for income diversification. In addition to income from food crops sales and other diversified sources, credit and cash remittances are important sources of cash income of a household.

Thirdly, national food security can be described here as food availability in the domestic food market, which can be determined by: food sold to the market by domestic producers and traders; food kept by domestic producers and traders which can be available in the market; and imported food (including food aid) while subtracting exported food.

Fourthly, a household can access to domestic food market to supplement their food deficit or to earn income by selling food. Besides, a household can access to the market to earn income by other diversified income generating activities.

Lastly, connecting all these functions by their cash flows, they can be integrated into a larger function of market transactions. Policies would influence this overall food security function by facilitating or directly leading to changes in some of the factors which constitute the function. For instance, if the producer prices of food staples are increased by the policy, food production would be more profitable. As a result, a household may increase their food production, thus there would be greater food production output which leads to improved household food stock and food availability in the domestic market. On the other hand, if the consumer prices of food staples are also raised as producer prices increased, households who need to supplement deficit of own food production would need more cash to purchase food. If a household is both food deficit and low income, increased food price would reduce household net income at the same time worsening access to food through market transaction. In this regard, it is very important to consider whether a household is a deficit producer or a surplus producer when the influences of policies on household food security are discussed.

As shown above, rural household food security in Malawi has to be analysed not only from the production aspect, but also from the aspect of exchange entitlement to food. Namely, how changes in exchange entitlement mapping influence household food security; and how macro factors i.e. policies and macro-economic environment have been pushing forward such changes.

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[3] Here, food remittance refers to food staple sent to a household often by relatives as a gift, which is common in rural Malawi.

Figure 1
Market transaction of food crops and cash flow of a household
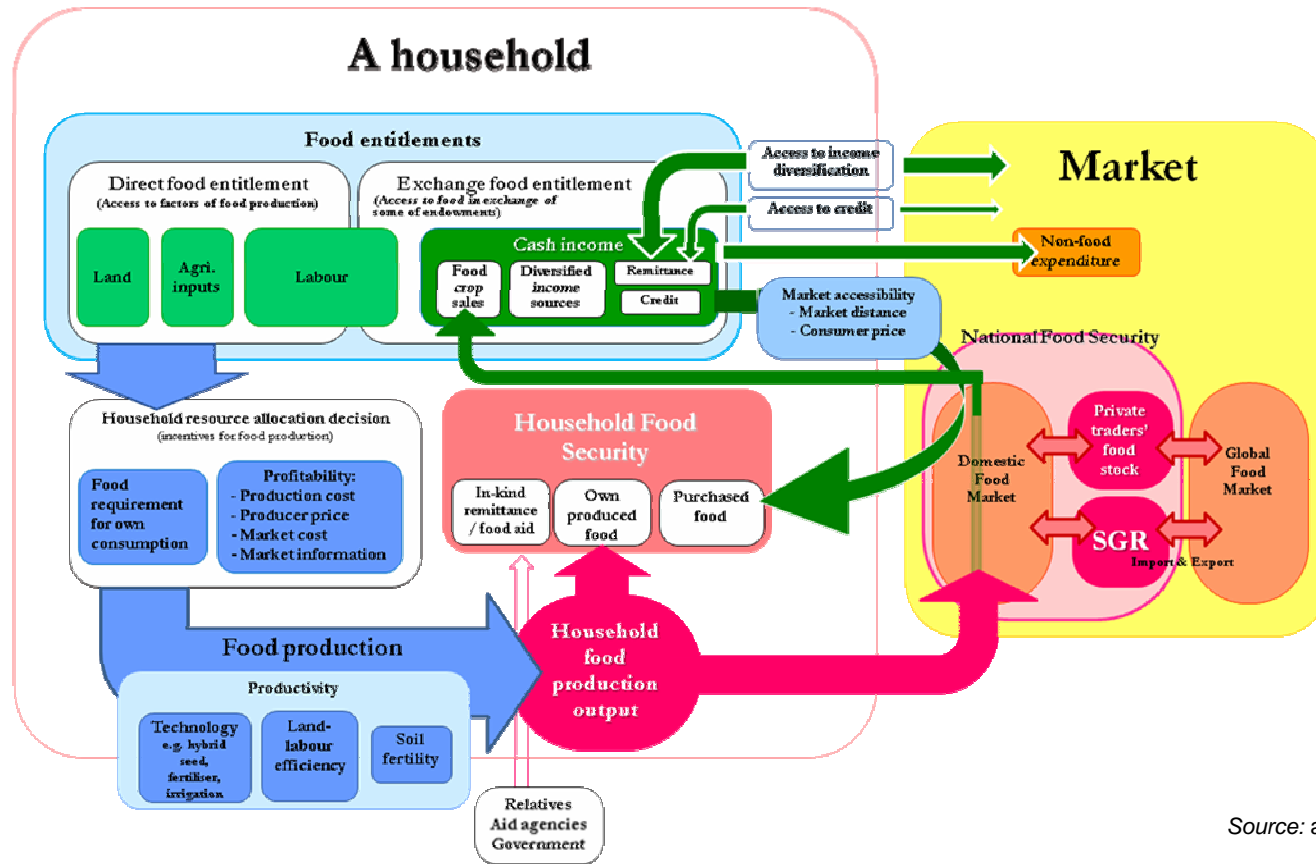
Chapter 2
MACRO CHANGES – MARKET LIBERALISATION AND INTERVENTION

In this chapter, evolution of food policies in Malawi in relation with its economic policies will be presented. Particularly, trade liberalisation and market intervention policies are receiving focus here as overall policies within which food policies are implemented. Also implications of such policy changes, notably variations in food and agricultural input prices will be discussed.

2.1 Economic phases in Malawi

The Evolution of Malawi's economic policies is characterised by continuous tensions between market liberalisation policies and state intervention policies, namely, strict state control over agricultural markets and their deregulations, and subsequent re-installation of some of the intervention measures. In this section, the first economic phase from independence which is characterised by strict food price control by the government of Banda regime[4] and the second economic phase which includes two types of policies – liberalisation policies along with the Structural Adjustment Programme (SAP) and re-installed market intervention policies – will be looked.

Since its independence in 1964, the government of the first president Banda had been pursuing policy towards rapid economic growth. In order to achieve this objective, there was a need to raise government revenue to invest in the estate sector which was regarded as the most important the growth. The estate sector was given privileges to earn foreign exchange by exporting cash crops such as tobacco and tea, while the small holder sector was exploited. At the same time, food policy was aimed at domestic food self-sufficiency (Quinn, 1994). A dual market system was used to implement such policies, allowing the estate sector to make more profit through private trade while controlling markets of smallholder sector by the parastatal marketing board, the Agricultural Development and Marketing Corporation (ADMARC) (Smith, 1995). Smallholders were not legally allowed to grow profitable export cash crops such as burley tobacco, while other smallholder export crops were only allowed to be sold to ADMARC. Domestic prices for these smallholder crops were kept "well below export parity" (Harrigan, 2007) which ranged "between

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[4] Political changes in Malawi since its independence: On 6th July 1964, Malawi declared independence from the British. Two years later, Kamuzu Banda of Malawi Congress Party was appointed as the President of the Republic of Malawi, who later assumed president-for-life. His administration as one-party state continued for three decades until presidential election was held in 1994, electing Bakili Muluzi, from the United Democratic Front as President. Bakili Muluzi continued his administration for 10 years. In 2004, Bingu wa Mutharika from the United Democratic Party (UDF), assumed the president through presidential election, who later left the UDF and formed the Democratic Progressive Party (DPP) in February 2005.

one third and one half of market prices" (Harriss et al., 1992). On the other hand, smallholder agricultural production was encouraged through subsidised inputs (ibid.) Such policies enabled Malawi to achieve annual GDP growth of 6.7 per cent on average for 15 years since its independence (WDI, 2006) (see Figure 2), while being a nationally self-sufficient producer of maize – once seen as "an African success story" (Quinn, 1994). However, it turned to an importer of maize to sustain a national food balance since the economic crisis during 1979-1981. There were several factors contributed to this economic crisis. On the one hand, Malawi's export performance was deteriorated by the world economic crisis in the 1970s; while on the other hand, transport costs for imports and exports were increased since less costly Mozambique route was closed in 1979, resulted from the war in Mozambique (Chilowa, 1998). Thus, balance of payment deficit of the government had grown substantially and GDP growth stopped by 1980 (see Figure 2).

Figure 2
GDP growth in Malawi (1965-2004)
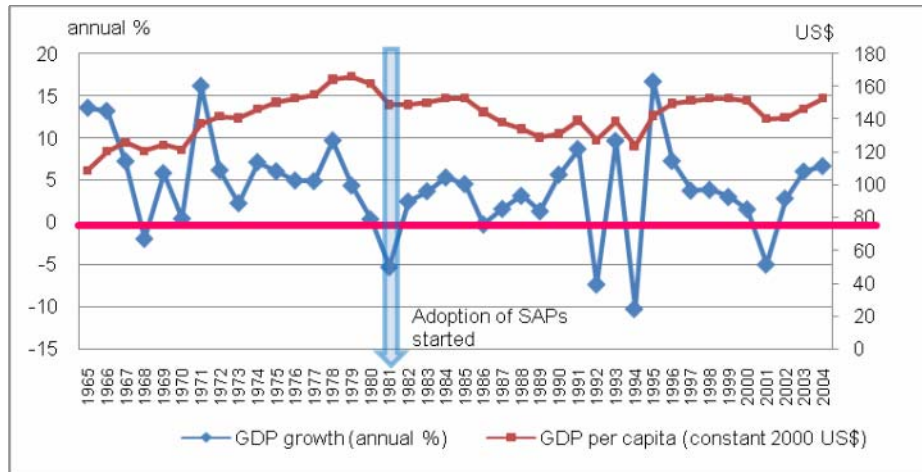
Source: Own elaboration based on World Development Indicators (World Bank, 2006)

To address such economic crisis, a Structural Adjustment Programme (SAP) was adopted in 1981 with three Structural Adjustment Loans (SALs) until 1986 (Smith, 1995), lending US$224 million to the government (Harriss et al., 1992). It was aimed at promotion of exports to improve balance of payments, at the same time leading to higher economic growth. To achieve this, it instructed to remove constraints on export production, particularly price constraints created by the state intervention policies (i.e. which accounted for low producer prices). In general, the measures to remove such constraints include eliminating or lowering import and export tariffs, removing subsidies, implementing national currency devaluation and dismantling agricultural marketing board. By removing the constraints, namely, by aligning the producer prices closer to the world prices, the higher producer prices would create greater incentives for production. Thus, it was expected to lead to the greater production and improved export performance. Besides, liberalisation would improve productivity since it facilitates more efficient allocation of resources and improvement of total factor productivity through technology

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transfer (UNCTAD, 2008). Therefore, conditionality attached to SALs included: reducing ADMARC's role, eliminating subsidies to smallholders and privatising trade of smallholder crops while ADMARC should remain as "a buyer of last resort" (Harriss et al., 1992). At the initial stage of the liberalisation, producer prices for smallholder export crops were increased while producer price for maize was reduced (Harrigan, 2007). Since 1987, private trade of smallholder crops had been legally allowed except for tobacco and cotton (Smith, 1995), while ADMARC continued implementing government price policies. In 1990s, production of burley tobacco was opened to smallholders (Harrigan, 2007). Thus, policies were shifted to support liberalisation, expecting the supply response of agricultural production to the price incentive, namely, achievement of more agricultural production and improved export performance. In theory, this could happen through channels such as: "vent for surplus effect" where previously unused resources are utilized as a response to the price incentive; the reallocation of resources where more efficient use of resources (such as land, labour, and capital) by households could be achieved; and agricultural intensification through additional labour, agricultural inputs and capital; as well as increased investments and technological progress (UNCTAD 2008).

It is observed through the performance after the adoption of SAP in Malawi that "the initial SALs achieved their macroeconomic objectives of an improved external and internal balance", while "the 'supply response' from the small-scale agricultural sector has been pitifully low", suggesting that price incentives did not lead to the greater production (Lele, 1990, op cit., and Harriss et al., 1992). Explanations to this include non-price constraints to the supply response. It is argued that the liberalisation policies in Africa did not address the key non-price constraints to supply response of agricultural production. Looking at the channels of supply response discussed above, availability of unused resources (e.g. land and labour) and capital could be one of the constraints. Besides, with regard to resource allocation, to what extent households are flexible to reallocate their resources could also be a constraint (UNCTAD, 2008). Especially, gender relations within a household would be important in household resource allocation decisions. For example, in a household, if decision making on utilization of household cash income is dominated by a man while crop production being mainly work of a woman reflecting the society's division of labour, the woman may not be motivated to increase production since she may not have control over the increased cash income created by her additional production. There is still such type of division of labour observed in rural Malawi until the present. With regard to the channel of supply response through agricultural intensification, the price policies implemented by the reform themselves contributed to constraints on increasing agricultural productivity. Removal of fertiliser subsidies led to high fertiliser prices where smallholders' accessibility to additional input to increase productivity was constrained. Reducing the role of ADMARC led to break down of fertiliser distribution system and reduced credit availability to smallholders since the private sector was too weak to take these roles. As well, "there were too few traders to take up the grain marketing and distribution role of ADMARC" (ibid.) Removing subsidies combined with currency devaluation

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also resulted in increase in cost of production and marketing. Thus, smallholder agricultural production was constrained, where the reform itself created the impediment to smallholder agricultural development.

Despite international pressures against the state intervention measures, agricultural subsidies have been re-introduced several times since the 1980s (Harrigan, 2007). Currently, President Mutharika has been intensifying a fertiliser subsidy programme to promote domestic maize production aiming at increasing agricultural productivity (Orr, et al., 2001 and Harrigan, 2007). This could be seen partly as a measure addressing the constraints on the supply response of agricultural production discussed above. Combined with favourable weather, such re-installation of fertiliser subsidies led Malawi to turn again in an exporter of maize since 2006. However, it is important to remember that the cost of subsidies has been quite expensive, affecting the government budget. This was experienced in the economic phase before the adoption of SAP in Malawi, contributing to the economic crisis. As well, the government has been trying to continue controlling agricultural market by regulating activities of private trades. The export restriction on maize has been frequently imposed on private traders, while the ban over private trade of maize has been re-installed since 2008, appointing again ADMARC as a sole trader of maize in the country[5] (IRIN, August, 2008).

2.2 Evolution of food security policies

As already shown in the preceding section, food policies in Malawi have been switched along with the transition of economic policies. In this section, food policies are looked in detail, particularly looking at agricultural market system, Strategic Grain Reserve and fertiliser subsidies.

Agricultural marketing system – ADMARC and Private traders

Before the adoption of SAPs, ADMARC had a function to stabilise food and agricultural input prices through subsidised agricultural inputs to smallholders as well as purchasing maize at pan-territorial price and selling it in domestic market at subsidised pan-seasonal and pan-territorial prices. It also functioned to create financial surplus through its price control thereby raising government revenue and increasing investment to the estate sector. When the SALs were approved, the conditionality to raise producer price of export crops meant reducing profit for ADMARC. As a result, ADMARC's ability to subsidise the consumer price of maize and its other "developmental" functions were affected significantly (Smith, 1995). Combined with the external shock experienced in Malawi from the end of 1970s to the early 1980s, it led to a

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[5] Recently fixed prices on maize purchasing price and selling price have been re-introduced at ADMARC depots. ADMARC would buy maize from producers and traders at MK45 (US$0.32) per kilogramme and sell it to consumers at MK52 (US$0.37) per kg (IRIN, August, 2008) (prices are as of August 2008).

financial crisis of ADMARC by 1986 where it failed to purchase maize from the domestic market, and to supply agricultural inputs to smallholders. Although at the early stage of SAP, ADMARC's operation was encouraged by donors including the World Bank to minimise the weakness of the private sector, since the financial crisis of ADMARC, it was turned to advocate private trade. Private traders were allowed to enter into smallholder crop markets including maize since 1987, while ADMARC continued implementing pan-seasonal and pan-territorial price policies. In order to encourage small private traders to purchase maize from smallholders and deliver it to ADMARC, a wholesale purchase system was introduced in the late 1980s, where the wholesale purchase price was set for maize brought to ADMARC by private traders. On the other hand, international maize trade by private traders has been often regulated by the government. Re-installation of a ban over private trade of maize since 2008 has brought the country back to the intervention policies that the maize market should be only controlled by ADMARC (IRIN, August 2008).

Strategic Grain Reserve

In 1980, the Strategic Grain Reserve was purchased by the Government, and ADMARC was appointed to operate it. The government of President Muluzi established in 1994 also continued operating the SGR though ADMARC, financing it through the Ministry of Finance (Government of Malawi, 1995, op cit., Smith, 1995). However, the donors argued that "SGR should be run independently, on a cost-recovery basis" (Devereux, 2002). In 1999, the National Food Reserve Agency (NFRA) was established as an independent trust to operate SGR taking over from ADMARC. The principal objective of SGR is to stabilise supply and prices of food staples through managing the grain reserve namely, release the reserve when grain supply in the domestic market is insufficient, thereby lowering the prices, while keep the reserve to raise the prices when supply is in excess. However, there is a counter-argument that "Malawi ... frequently holds a large reserve and intervenes ... in the market, but shows the highest seasonal price movement, averaging 90 percent over the last decade" (Tschirley and others, 2004 op cit., The World Bank 2005).

Fertiliser subsidy programme

In Malawi, the use of fertiliser subsidy has been one of the important measures to increase production as well as to achieve food security. Before the adoption of SAPs, ADMARC had been providing subsidised seeds and fertilisers to targeted small holders as well as purchasing and selling of maize at relatively low price compared with the prevailing domestic market price.

As a conditionality of SAPs, removal of fertiliser subsidies in phases was agreed in the SALII in 1982 (Smith, 1995), and following year, ADMARC's monopoly in fertiliser supply was transferred to a Smallholder Fertiliser Revolving Fund which later became Smallholder Farmers Fertiliser Revolving Fund of Malawi (SFFRFM).

However, fertiliser subsidies were reintroduced in late 1980s and removed again in 1996 (Dorward, et al, 2008). In 1997/98 combined with currency

devaluations, price of fertiliser was increased sharply. On the other hand, from 1998 onwards, free agricultural inputs distribution programme as 'Starter Pack' was introduced, which was scaled down to Targeted Input Programme (TIP) from 2000/01 to 2004/05 planting years. The 2005/2006 planting year had input subsidy through ADMADC, followed by scaled up fertiliser subsidies in 2006/2007 where Agricultural Input Subsidy Programme (AISP) of the government distributed 3 million fertiliser coupons to targeted households country wide. The share of the payment required to the household with a coupon was about 28 per cent which was MK950 (US$6.8) per 50kg fertiliser bag, while the prevailing market price was around MK3500 (US$25). The laege scale subsidies were continued in 2007/2008 (ibid.). These subsidy programmes contributed to bumper harvests of three years in a row, combined with favourable weather.

2.3 Implications for food and agricultural input prices

In this section, the influence of policy changes on prices of food and agricultural inputs will be discussed.

Food Prices

Before the adoption of SAPs, food prices were fixed at pan-seasonal and pan-territorial prices. The producer price for maize was protected, while the consumer price for maize was subsidised (Smith, 1995). Since the market liberalisation there had been two markets for smallholders to access to food – ADMARC and the commercial market with private traders. Even after the adoption of SAP, ADMARC has been operating the subsidised prices within a dual market system.

In theory, if the official prices set by the ADMARC are low, a producer would be discouraged to produce for ADMARC. It would also affect negatively to the availability of food in the domestic market particularly food stock by ADMARC and the Strategic Grain Reserve. Under a dual market system, ADMARC would fail to purchase enough grain since there is competing commercial market where higher producer prices would be offered. On the other hand, in the context of ADMARC's monopoly in the agricultural market by imposing a ban over private trade of maize – which characterises the period before liberalisation and the latest context in Malawi – such regulation may create illegal private market, where prices would become more expensive than it would have been in the free market.

In practice, ADMARC's supplies have been erratic and purchases have been rationed when demands are high and supply is scarce, while availability of food staples in the commercial market has been better than ADMARC. However prices in the commercial market have been varied according to the agricultural seasons. It is therefore argued that agricultural market liberalisation in Malawi has widened seasonal price variation:

> "In most years, retail maize prices in Malawi are lowest after harvest in June/July, and rise by 50-100 per cent over the next months, peaking during the lean period between December and February [...] In a case of

Lizulu market, retail maize price rose from MK 8.80/kg in June to MK 25/kg in December" (Devereux, 2002).

Such seasonal price variation is a normal behaviour of a liberalised market. For traders, the variation between the purchasing price and the selling price creates profits. It is thus the incentive for private trade at the same time providing the population opportunities to benefit from trade and improve their livelihood. Before the liberalisation of agricultural market, there was no such opportunity for smallholders. However, too high margins and fluctuation might be negative for deficit producers.

Figure 3
Maize retail price in Lilongwe, Malawi (2006-2008)
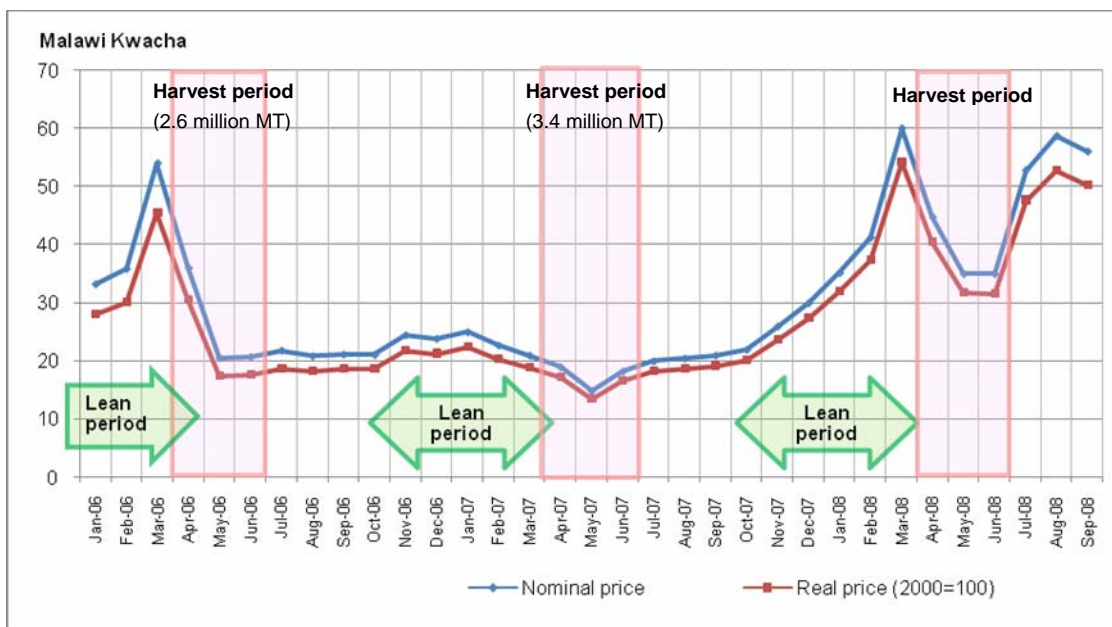
Source: Own elaboration based on FEWS NET, CPI (2000=100) based on NSO[6]

Figure 3 shows the movement in retail maize price in Lilongwe[7] during the period from 2006 to 2008. It is observed from the Figure that the price goes up towards the harvest period and goes down soon after the harvest, then gradually increases again until the end of lean period. The reduced harvest in 2005 influenced the price increase during the lean period of 2006. On the other hand, the bumper harvest in 2006 contributed to the stable low prices during the following lean period of 2006/07. However, there is a price hike observed in the lean period of 2007/08 in spite of the bumper harvest of 3.4 million

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[6] Maize price data was collected from FEWS NET (2006-2008 maize monthly retail price in Lilongwe) and deflated by CPI (2000=100) based on NSO data.

[7] The Capital city of Malawi located in its central region.

tonnes in 2007. It could be partly attributed to the sharp increase in the world food prices which has been striking the global food market since the same period: "During the first three month of 2008, international nominal prices of all major food commodities reached their highest levels in nearly 50 years while prices in real terms were highest in nearly 30 years" (High-level Conference on World Food Security, 2008). According to the analysis on how domestic prices of maize importing countries are influenced by world prices, "variability in world prices accounted for at least 25 percent of domestic maize price fluctuations" in Malawi, in the period of post 1991 (The World Bank, 2005). Figure 4 shows maize real prices overtime in Malawi since 1980 until the present. It is observed from the Figure that the prices have been steadily increasing from mid-1990s with the sharp price hike in 2008. Such price increase overtime could be largely attributed to the economic policy reform and remodelled food security policies discussed in section 2.1 and 2.2, combined with the movement of the world prices as discussed above.

Figure 4
Maize real price in Malawi (1980-2008)
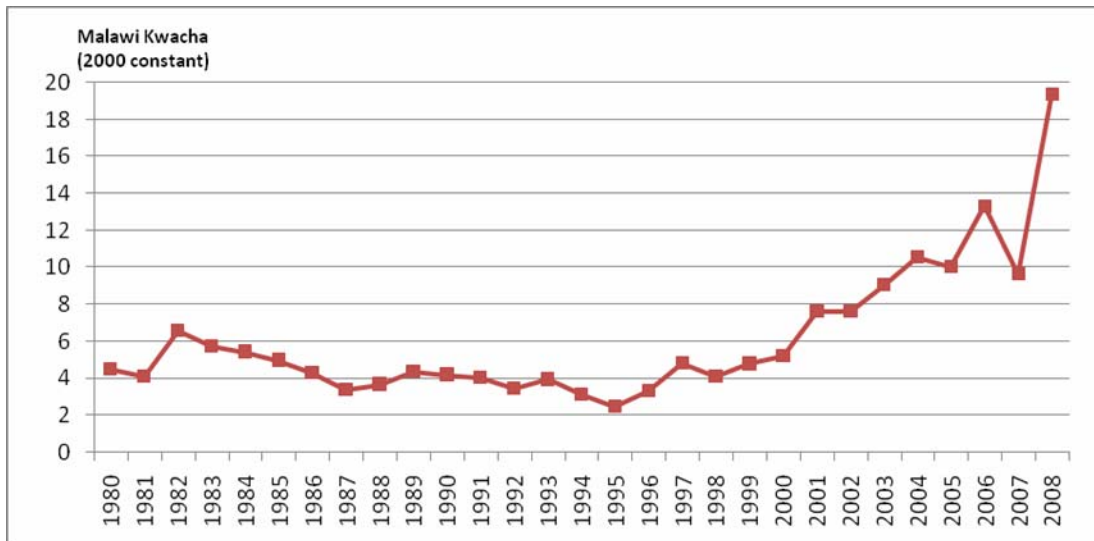
Source: Own elaboration based on FAOSTAT and FEWS NET
Prices are deflated by Food price index (2000=100) based on WDI and NSO[8]

Fertiliser Prices

The nominal price of fertiliser in Malawi has been increasing steadily (Dorward et al., 2008). In real term, it has increased approximately 250 per cent in a decade during the period of 1998-2008 (ibid.). Since fertiliser in Malawi has been fully depending on imports, the price increase largely attributed to the

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[8] Prices are based on FAOSTAT (1980-2005, maize producer price, Malawi) and FEWS NET (2006-2008, maize retail price, Lilongwe) and deflated by Food price index (2000=100) based on WDI 2006 (1980-1999) and NSO (2000-2008)

sharp world price increase in fertiliser, where nitrogen prices increased threefold during the same period (World Bank Commodity Outlook, op cit., Dorward, 2008).

Figure 5
Fertiliser/Maize price ratio in Malawi (2000-2008)

Figure 5 shows ratio of fertilizer price by maize price between the period 2000-2008. While both maize prices and fertiliser prices have been increasing, the fertiliser/maize price ratio is also almost steadily increasing, indicating that fertiliser prices are increasing faster than maize prices. Implication of such pattern of the price increase on food security will be discussed in Chapter 4.

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[9] Data on fertiliser prices are based on historical fertiliser prices by Yara International <http://www.yara.com/en/investor_relations/analyst_information/fertilizer_prices/index.html>. Retail fertiliser prices are estimated base on FAO/WFP Crop and Food assessment report (Arya et al., 2005). Maize prices are based on FAOSTAT (2000-2005, maize producer price, Malawi) and FEWS NET (2006-2008, maize retail price, Lilongwe). Both maize and fertiliser prices are nominal prices.

Chapter 3
EMPIRICAL ANALYSIS OF FOOD ENTITLEMENTS

In the preceding chapter, policy changes and their implications on prices of food and agricultural inputs have been discussed.

In this chapter, empirical analysis on food entitlements of rural households will be presented. It will explain how household food security in rural Malawi could be understood as a function of cash income, using two sets of data from household surveys in Malawi.

3.1 Types of access to food by households

As discussed in Chapter 1, access to food by individual households can be categorised into two types of access. One is the access through own food production, another is the access through market transactions of food. More specifically, being able to access to food through these channels is described as one's food entitlements. An individual household needs either endowment for food production to ensure 'direct food entitlement' or endowment for food purchase to ensure 'exchange food entitlement' or a combination of the two if household food production is not enough for its own consumption. Now, which type of access is predominant in rural Malawi, and what does it imply in relation to the way policies influence household food security, as well as the way households respond to the policies? The latter will be discussed in Chapter 4, while this section will focus on the former – the types of access to food.

Figure 6
Consumption period of own produced maize
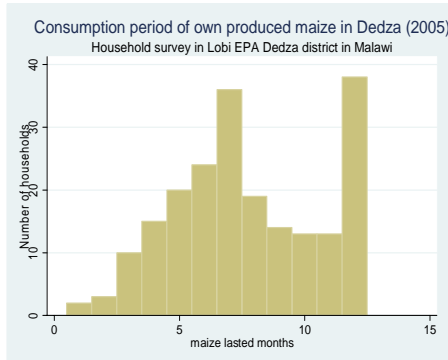
Source: Own elaboration based on the household survey by Lobi EPA in Dedza District, 2006

According to a national household survey in 2004/2005, The Second Integrated Household Survey (IHS2) [10], approximately 90 per cent of rural households in Malawi are maize producers. However, most of the rural households in Malawi are not self-sufficient in their staple food. Many of them run out of their own produced maize several months before the next harvest of maize (Orr et al., 2001 and Harrigan, 2007). A household survey by Lobi EPA in Dedza District shows how

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[10] The Second Integrated Household Survey 2004/2005 (IHS2) is a nationally representative sample survey conducted by the National Statistical Office under the Integrated Household Surveys Programme from March 2004 to April 2005. The survey covered a nationally representative sample of 11,280 households spreading wide, out of approximately 12 million population of Malawi (at the time of the survey) which consists of approximately 2.7 million households (as of 2004).

long own produced maize lasted from the harvest[11] (Fig.6). The median is 7 months, suggesting that 5 months before the next harvest, half of the surveyed households were without their own maize stock. It should be noted that the year referred in this survey is 2004/2005 consumption season which was determined by the harvest in 2004; 1.6 million tonnes which is 77 per cent of 10 years national average production. However, looking at other years, it appears that even in a good harvest year of 2000 which refers to 2000/2001 consumption season with a national harvest of 2.5 million tonnes, quite a large portion of rural households are deficit producers (Fig.7).

Figure 7
Maize deficit months of smallholders in Malawi
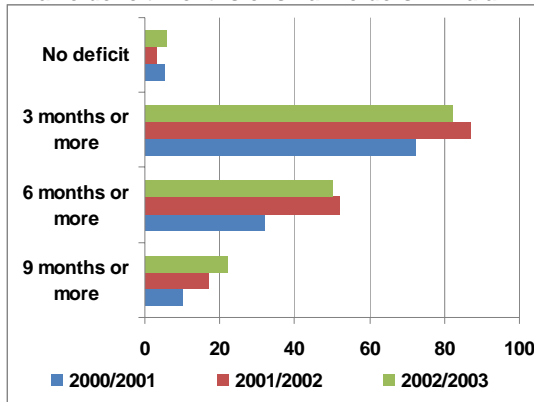
Source: Own elaboration based on Table 2 in Harrigan, 2007

However, low maize production does not necessarily make rural households food insecure. Income from off-farm sources and cash crops plays significant role to determine food security of a rural household.

The data from household survey by Lobi EPA shows that 67 per cent of the households depend on market to supplement deficit of own food production, while 8.6 per cent get their food only from own production.

As a coping strategy when both food from own production and purchased food was finished, 70 per cent of households in the household survey by Lobi EPA answered that they worked as casual labourers (*ganyu*)[12]. In-kind remittances appeared to be another important food source while selling own livestock and reducing daily meals turned to be also prominent coping strategies (Fig.8).

Figure 8
Household coping strategies when food is finished
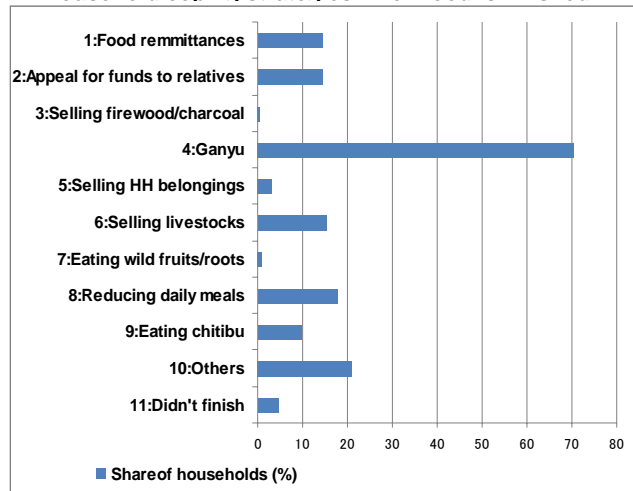
Source: Own elaboration based on the household survey by Lobi EPA in Dedza District, 2006

[11] The survey was conducted in January 2006 by Lobi Extension Planning Area in Dedza District. The data was obtained from 200 households in rural agricultural area.

[12] *Ganyu* is a word in Chichewa, an official language in Malawi, which refers to temporary agricultural wage labour on daily basis, paid in either cash or in-kind e.g. maize grain or maize flour.

According to Agricultural Input Subsidy Survey (2007, op cit., Dorward et al., 2008), among 2591 surveyed households who were maize producers, 60 per cent of rural households were net maize buyers, including 4 per cent of households who sold maize, while the rest only bought to supplement their production deficit.

On the other hand, only 10 per cent of the surveyed households were found as net maize sellers including 7 per cent of households who only sold their surplus production but did not buy any maize. Who neither bought nor sold maize (i.e. subsistent-oriented producers) were 29 per cent of the surveyed households. Thus, it is summarised that only 14 per cent of maize producers sold their own produced maize in markets, while the vast majority, 85 per cent of the maize producer did not sell any, while more than half of the households only buy maize to supplement their production deficit.

3.2 Access to factors of production – Direct food entitlements

It was shown in the preceding section that majority of rural households in Malawi are food deficit producers. Figure 9 shows distribution of rural households in terms of their maize harvest quantity. It shows that majority of the households have low maize production level with fewer households producing large quantity. What are the contributing factors to this situation?

In order to produce food, individual households need to access to factors of production; which could be described as a prerequisite to ensure direct food entitlements. Initial endowments of a household to produce food represent factors of production. In this section, access to factors of production by individual households in rural Malawi will be examined.

Figure 9
Maize harvest quantity of rural households in Malawi

Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005

Land

According to IHS2, the median landholding size of rural households in Malawi is 0.7 hectare (Fig.10) where the total land area of the country is 94,080 km^2 (World Development Indicators, 2006). Malawi is characterised by its high population density, which could be one of the reason accounting for this small landholding size of rural households. Malawi's total population is estimated at 13.9 million (UN, 2007) and average population density based on land area is approximately 148 persons per km^2, being one of the most densely populated countries in Sub-Saharan Africa. "Overall national population density may exceed 220 persons per square kilometre" by 2020 due to current high annual population growth rate of 3.2% (FANRPAN, 2006). However, it is not only

high population density but also skewed distribution of land attributes to land scarcity in Malawi:

"Land scarcity exists in spite of idle lands. On the basis of estimates made in 1994, 2.6 million hectares [approximately 27 per cent of the total land area] of suitable agricultural land remains uncultivated in the rural areas" (ibid.).

Figure 10
Landholding size of rural households in Malawi
(Integrated Household Survey 2004/2005)
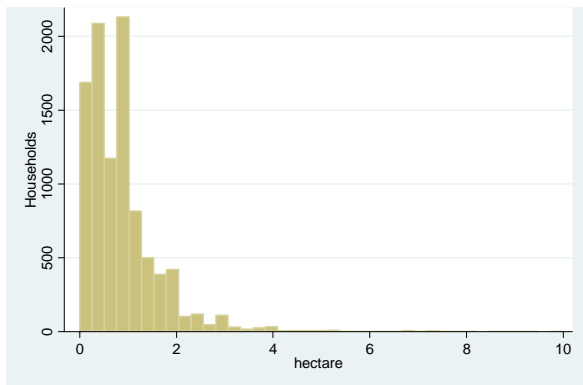
Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005

Some argue that such character of limited land combined with unequal distribution in Malawi would be one of the major factors of food insecurity of rural household in Malawi. Devereux (1997) states that given average land size for most small holder households is 0.8 ha, "those farming less than one hectare face severe and recurrent production deficits, while only those whose landholdings exceed two hectares are producing sizeable surpluses for sale", emphasising that even in a good harvest year, average land size of 0.8 ha is insufficient to support household food requirement throughout the year.

In order to examine such relationship between landholding size and household food production, IHS2 data was analysed. Rural households sampled in IHS2 were categorised into five land categories[13]. Category 1 represents households with landholdings below 0.4 hectare, which is almost half of the median landholding size of total sample population. Category 2 represents households with landholding size between 0.4 to 0.7 hectares where 0.7 hectare is median landholding size of total sample population. Category 3 covers households of

Figure 11
Maize harvest of rural households by land categories
(Integrated Household Survey 2004/2005)
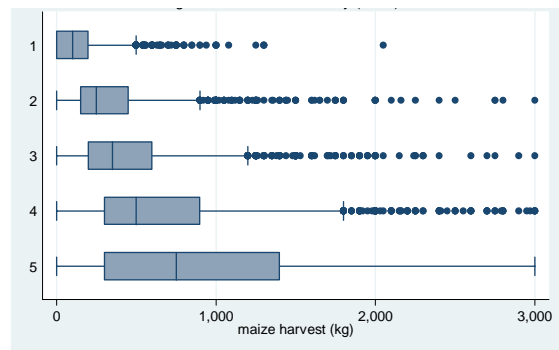
Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005

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[13] The sample households are categorised into five land categories by 25, 50, 75 and 95 percentiles of landholding size (Table 2 Annex I). Categories 1 and 2 cover 50 per cent of total sample size while categories 3, 4 and 5 cover another 50 per cent of rural population sampled in the survey, where category 5 covers approximately 5 per cent of the total sample size.

landholdings between 0.7 to 1.2 hectares while Category 4 is households with landholdings between 1.2 to 2.4 hectares. The last category, Category 5 represents households with landholdings above 2.4 hectares. It is observed from the data that larger landholdings show wider distribution in harvest amount of maize with higher median, implying that large landholdings would provide possibility for increased production (Fig.11).

However, it should be kept in mind that the size of landholdings is not necessarily translated into household food security:

> "There is only a very weak relationship between landholdings and caloric inadequacy, suggesting that inadequate landholding size is not one of the major constraints to sufficient food consumption and nutritional outcomes. Though calorie inadequacy decreases slightly as land holdings get bigger, even in the top land quintiles, about 50 percent of individuals have consumption levels below the recommended requirements"
>
> (World Bank Report 2006, Malawi poverty and vulnerability assessment).

The IHS2 data on landholdings and food production is also consistent with this. In all landholding size categories, wide ranges of maize harvest are observed. In other words, households with various harvest amounts are spread in each category. In the largest category of above 2.4 hectares, range of such variation is the widest, while it has higher median harvests. Reflecting such counter-argument against positive relationship between land size and food production, some argue that "fertiliser use, rather than area cultivated is the main determinant of household food security" (Orr, 2001). As well, it has been often argued that food security is not necessarily achieved by land reform, since even if people have land rights formalised by land reform, lack of inputs to make land productive would hamper the achievement of household food security (Holden, 2006) [14].

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[14] The historical processes of land reform in Malawi dates back to 19th century, when "colonial land legislation" was implemented (Holden, 2006). Here, changes in land policy according to phases of the land reform are summarised:

When Malawi was colonised by the British in late 19th century, European settlers acquired land through 'agreements' with local chiefs. When British colonial state formalised the European settlers' land rights in 1902, indigenous communities subject to the claim had lost their land rights. Such land policy under colonial regime transferred fertile lands to white farmers (FANRPAN, 2006). The policy after the independence which favoured the estate sector contributed to a further land transfer from smallholders to the estate sector. Besides, the introduction of burley tobacco production to smallholders in 1990s accelerated economic differentiation influencing continuous land transfer, where some rural smallholders became landless (Holden, 2006). Such policies led to highly skewed, unequal distribution of land in Malawi.

> "The land policy [1965 Land Act]that allowed rapid conversion of customary land to agricultural leases for tobacco production, which took place in the 1970s and 1980s,

Agricultural inputs

As discussed above, low soil fertility of agricultural land in Malawi suggests that food production requires adequate amount of fertiliser to supplement it. Thus, access to fertiliser could be one of the determinants of household production[15].

According to IHS2, no fertiliser was applied to 59 per cent of crop plots where rain-fed crops were grown, According to a survey by IFPRI in 1998, only 35 per cent of surveyed households applied fertiliser in their fields[16], while "tobacco growers are three times more likely to apply fertiliser on maize than non-tobacco growers" (Minot et al., 2000).

Access to fertiliser by households is influenced by their income level and prices of fertiliser as well as its availability in the domestic market. Empirical analysis on household income will be presented in the next section (3.3), while changes in fertiliser prices have been discussed in the preceding chapter, in section 2.3. Then, how such price changes have been influencing household access to fertiliser will be discussed in detail in the next Chapter.

Labour

In rural Malawi, most of the low income food deficit households source their income from casual agricultural labour which is locally referred as *ganyu*. This often forces them to be engaged in *ganyu* at the critical time of maize production which, in turn, removes their ability to work for their own production sufficiently. This creates vicious cycle of low production, low income and limited labour power for own production. IHS2 data also shows that rural households in the lowest and second lowest income categories get larger portion of their income from agricultural temporary labour (see Figure 13 in section 3.3). Thus, low income of rural households and their immediate needs for cash could be seen as factors to limit household labour availability for their own food production.

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is the main cause of tenure insecurity, displacement of people, and shortage of land for farming" (The New Land Policy, 2002, op cit., Holden, 2006).

Following the review on land issues in 1996, policy for privatising customary land had been pursued by the government to secure customary land for individuals as a mean of agricultural development. However, the privatisation of customary land did not bring the predicted benefit but rather tended to "erode customary social values and institutions especially in matrilineal societies" (PCILPR 1998, op cit., Holden, 2006) A new land policy, *The Malawi National Land Policy (MLPPS 2002)* which was approved in 2002 is currently still on-going process for implementation in Malawi.

[15] In this paper, scope of access to agricultural inputs is limited in the discussion on fertiliser among other agricultural inputs such as maize seed, due to the limited size of the paper.

[16] Based on IFPRI-APRU National Survey of Small Farmers in Malawi (Minot et al., 2000).

3.3 Access to food through market transaction – Exchange food entitlements

As it was discussed in the preceding section, in order to make the best use of the factors of production such as land and labour, or in order to acquire agricultural inputs, household income could be the important bottle neck. In other words, adequate cash income provides households with access to agricultural inputs, which now enables them to make full use of agricultural land; at the same time it also helps them securing family labour for own food production, since it minimises household needs for sourcing income through casual labour during critical period for own food production.

In addition to its importance with regard to production, household income plays a very important role in ensuring access to food through market transaction i.e. exchange food entitlement.

In this section, household income will be examined in detail in order to look at exchange food entitlement of rural households in Malawi. The analysis on household income will also provide a perspective to look at the extent to which factors of production are influenced by the bottleneck of household income.

Figure 12
Household annual cash income in rural Malawi (Integrated Household Survey 2004/2005)

Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005

Income of rural households

Figure 12 shows the distribution of cash income of rural households in Malawi based on IHS2. It is observed that income distribution is highly skewed among rural households with majority having very low income. Median annual cash income gained by a household is MK7190 (US$63) while the mean is MK21125 (US$183) (Table2, Annex I)[17].

What are the reasons for such a skewed income distribution? Is such unequal income distribution attributed to differences in their income sources? Then, what are their income sources and to what extent do different sources make difference in household income level?

IHS2 data contains household cash income through production and sales of maize, vegetable, tree crops, tobacco and livestock including its by-products, as well as cash income through micro-enterprises, remittances, casual labour, wage/salary, allowances, credit, rental, pension, savings and others. Based on

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[17] In this paper, household income refers to cash income of households. When both income in cash and in kind are considered, such aggregated household income is higher than these figures. According to the report on IHS2 by NSO, an aggregate household annual income indicates MK40241 (US$350) as the mean value of the rural population in Malawi (NSO, 2005).

these data, household income sources are summarised in Figure 13, according to income levels of households. Rural households sampled in IHS2 were categorised into 6 income categories [18]. Category 1 represents the lowest income group while Category 6 represents the highest income group. From the data, it was observed that different income groups have different pattern in their cash income sources. Looking at the lowest income group, remittances account for one third of its cash income while 28 per cent is attributed to income from casual labour, followed by 14 percent from livestock production and its by-products. The importance of remittances as income of rural households has been often argued:

> "Given the depth of Malawian poverty, the share of household income from private transfers is remarkable and underlines their importance for household food security" (Orr et al., 2001).

In the second lowest income category, casual labour accounts for almost one third of its cash income, while micro-enterprise account for 18 per cent. In the third and fourth income categories, share of the income from casual labour also account for about one third of their cash income. On the other hand, shares of the income from tobacco and wage/salary are larger in these categories than the two lowest categories. Both the second highest and the highest income categories show more than one third of share from salary/wage in their cash income. At the same time, tobacco production and income from allowances have large shares in these categories.

It is also observed through all the categories, that although some households source cash from maize sales, it is not prominent source of cash. As discussed in section 3.1, majority of rural households mainly rely on market for maize purchase, while fewer households sell their own produced maize as either they have surplus or they are forced to do so by the distress such as immediate cash needs.

When all the cash income from various sources is summed up as an aggregate cash income generated by total rural population, cash earned by the highest income category through salary/wage, allowances and tobacco production accounts for large proportion of the total rural cash income (See Figure20 in Annex II).

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[18] Rural households in IHS2 are categorised according to their income levels by 10, 25, 50, 75 and 90 percentiles respectively (Table1 Annex I).

Figure 13
Shares of income from various sources – mean value by income categories
(Integrated Household Survey 2004/2005)

Percentage (%)

Lowest income category
(Rural households with annual income less than MK600)

Source	Value
Credit	1.7
Casual labour	27.8
Allowances	0.3
Salary	0.4
Others	0.3
Rental	0.0
Pension	0.0
Savings	0.0
Remittance	34.0
RNFE	0.0
Livestock & byproducts	14.4
Tree crops	11.2
Vegetables	7.2
Tobacco	0.6
Maize	2.2

2nd lowest income category
(Rural households with annual income MK600- MK2350)

Source	Value
Credit	1.5
Casual labour	31.0
Allowances	0.0
Salary	3.4
Others	0.0
Rental	0.0
Pension	0.0
Savings	—
Remittance	15.9
RNFE	18.0
Livestock & byproducts	10.9
Tree crops	7.2
Vegetables	5.9
Tobacco	1.6
Maize	4.6

Lower middle income category
(Rural households with annual income MK2350-MK7190)

Source	Value
Credit	3.1
Casual labour	36.4
Allowances	0.3
Salary	7.7
Others	0.0
Rental	0.2
Pension	0.0
Savings	0.0
Remittance	10.1
RNFE	11.5
Livestock & byproducts	9.1
Tree crops	4.2
Vegetables	7.6
Tobacco	4.8
Maize	5.0

Upper middle income category
(Rural households with annual income MK7190-MK19142.50)

Source	Value
Credit	3.7
Casual labour	29.7
Allowances	2.7
Salary	16.4
Others	0.0
Rental	0.3
Pension	0.1
Savings	0.1
Remittance	7.6
RNFE	6.5
Livestock & byproducts	8.8
Tree crops	2.4
Vegetables	7.1
Tobacco	10.1
Maize	4.6

2nd highest income category
(Rural households with annual income MK19142.50- MK45100)

Source	Value
Credit	4.7
Casual labour	14.4
Allowances	6.8
Salary	35.2
Others	0.0
Rental	0.2
Pension	0.2
Savings	0.0
Remittance	2.5
RNFE	3.3
Livestock & byproducts	6.3
Tree crops	1.4
Vegetables	4.7
Tobacco	17.0
Maize	3.2

Highest income category
(Rural households with annual income more thanMK45100)

| Source	Value
Credit	7.0
Casual labour	8.8
Allowances	16.7
Salary	35.7
Others	0.2
Rental	0.8
Pension	0.2
Savings	0.7
Remittance	1.1
RNFE	2.6
Livestock & byproducts	4.3
Tree crops	0.3
Vegetables	1.6
Tobacco	16.2
Maize	3.9

Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005

As described above, types of income sources characterise different income groups of rural households. This implies that types of income generation activities which a household can access, could partly determine the income level of a household. In addition, it could be also suggested that there are bottlenecks to access to high return income activities, which may account for limited options for income activities by low income groups. Looking at the fact that burley tobacco production characterises income sources of high income groups, does household landholding size to grow cash crops play an important role in income levels of rural households? It is more unlikely that there is direct relation between them, as already discussed in section 3.2, namely, landholding size does not necessarily mean greater food production since agricultural inputs and limited family labour could be bottlenecks to utilise land to its potential. The same could be said to burley tobacco production, suggesting that household access to capital to invest in agricultural inputs to grow cash crops is one of the determinants to make the best use of land for high return income generation. To prove this, relationships between household income and landholding size are examined based on IHS2 data.

Figure 14
Cash income of rural households by land categories
(Integrated Household Survey 2004/2005)
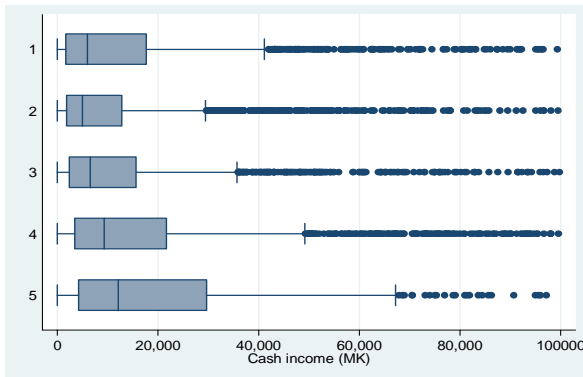
Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005

Rural households sampled in IHS2 are categorised into 5 groups according to their landholding size, as described in the preceding section. Figure 14 shows income distribution within each group of landholding size. The Figure shows that among 50 per cent of the total sample population who have median landholding size or below it (i.e. categories 1 and 2), smaller land size shows slightly higher cash income (by comparing median of two categories). This suggests that there are households with very small or no land but generating cash income from diversified sources not necessarily from agricultural production. Orr et al. (2001) give explanation to this: Among the households surveyed in the Food and Nutrition Monitoring Survey, households with very small landholdings (0.5 ha or less) did not necessarily have the lowest incomes. The reason is that households with small land might have other income sources such as off-farm employment.

Coming back to IHS2 sample households, on the other hand, among another 50 per cent of the sample population whose landholdings are above median size, median cash income increases as land size increases. However, it should be noted here that each category in Figure 14 shows distribution pattern, namely, household cash income ranges widely in each category. The 5 per cent with landholdings of more than 2.4 hectare shows widest range of distribution in cash income as well as the highest median cash income.

Similarly in Figure 15, distributions of landholdings in different income groups are shown, where rural households in the total sample population are categorised into 6 income groups. It indicates that the median landholding sizes in all income groups are in the range of 0.6-0.9 hectares. At the same time, it can be observed that higher income groups have wider distribution in landholding size i.e. there are more households with large landholdings in higher income categories though they are not majority.

Thus, while it might be also suggested that larger landholding size would provide one of the opportunities for higher income, it was observed from the survey data that larger land holding size does not necessarily mean higher income. There would be some other bottlenecks to achieve higher income rather than landholding size.

Other possible contributing factors to both unequal access to income generations and the resulting unequal income distribution among rural households will be discussed in the next Chapter in relation with the discussion of policy changes and their influence on rural households in Malawi.

Figure 15
Landholding size of rural households
by income categories
(Integrated Household Survey 2004/2005)
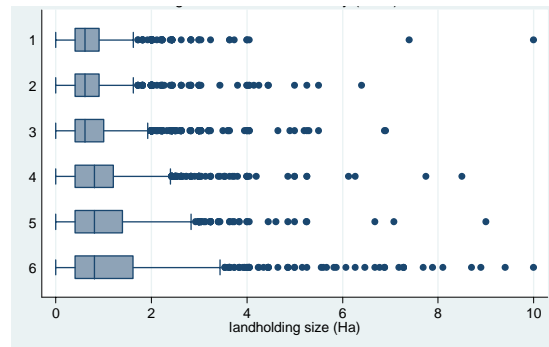
Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005

Access to maize in markets

It is clear that households with low cash income have little access to maize in markets, namely, they are lack of exchange food entitlement. Higher income categories could be food secure through their exchange food entitlement even though they would be food deficit in terms of their own production. This is also implied from IHS2 data. Given average household size of 4.6 people in the sample population and FAO recommendation of annual calorie intake of 180kg maize equivalent per adult, a rural household of an average household size would require approximately 800kg of maize grain per year. The median household in the sample population in terms of maize harvest had 492kg of own produced maize. Based on the maize retail price range during 2005 (FAO/WFP, 2005), this household would have needed about MK5500 (US$48) or more to purchase maize for supplementing the shortage[19].

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[19] Approximately MK15000 (US$130) was needed for a household to purchase 800kg of maize when it is calculated at MK18 per kilogram, which was within the range of maize retail price fluctuation during 2005. Exchange rate to a dollar was US$1 to MK115 on average in 2005, which gives US$ 0.16 per kilogram of maize.

IHS2 data shows that more than one third of the sampled rural households have annual cash income of less than this level.

As described above, low production combined with low income of majority of households depict food insecurity situation of rural households in Malawi. More precisely, household income and food production in rural Malawi are not uniformly low, but they are characterised by unequal distribution among rural households. From the analysis in this chapter, it would appear that both entitlements to food through own production and through market transaction are influenced by household income. While exchange entitlement to food is directly influenced by household income, direct entitlement to food could be influenced in the way factors of production such as land and labour are utilized. Income allows households to buy fertiliser to utilize land to its potential, at the same time reducing needs for being engaged in casual labour when family labour is needed for own production. Thus, household cash income could be seen as one of the most important bottlenecks in ensuring food entitlements in rural Malawi. Therefore, household food security in rural Malawi could be described as a function of household cash income rather than other factors of food production. The next Chapter will discuss how policy changes have been influencing such aspect of household food security – changes in *exchange entitlement mapping* – as well as how rural households have been responding to those changes.

Chapter 4
MACRO CHANGES AND FOOD ENTITLEMENTS

This Chapter will link the analyses in preceding chapters, discussing how policy evolution and resulting price variations have been influencing alterations in *exchange entitlement mapping*, thereby contributing to diversification in access to food by rural households.

First, food security situation in Malawi in terms of aggregate food availability will be examined along with the discussion of influence of policy evolution on aggregate food availability. Secondly, the implications of price variation resulting from the remodelled policy on individual access to food will be analysed.

## 4.1 Macro changes and aggregate food availability

Aggregate availability of maize is determined by national production and import and export of maize, supplemented by food aid.

From 2001 to 2005, for 5 years national maize production had been lower than the national food requirement of 2.4 million tonnes (FEWSNET, 2008), while from 2006 it has turned to recording a surplus. 2.6 and 3.4 million tonnes of maize were harvested in 2006 and 2007 respectively (FAOSTAT 2008, Fig. 16), and another bumper harvest in 2008 is expected to record a surplus again (IRIN, February 2008).What are the possible factors which have been influencing such movement of national maize production in Malawi? National food production could be influenced by accessibility of fertiliser to food producers including its aggregate availability and prices in the domestic market; production incentives or disincentives through maize producer prices; and weather conditions.

An example of the influence of fertiliser availability on maize production can be found in the case of the 2005 reduced maize production. According to FAO statistics, the maize harvest in 2005 was 1.2 million tonnes, where average harvest for the past 10 years from 2007 has been 2.1 million tonnes, hence, it was less than 60 per cent of the 10 years average. FAO and WFP mission to Malawi for crop and food supply assessment in 2005 highlighted possible causes of this reduced production.

First, "rains failed at a critical time when the maize crop was at the stage of cob formation and pollination" (FAO/WFP, 2005) combined with heavy rains at the early growing stage causing significant damage to crops through flooding. But there were other crucial issues which affected the production. In June 2004, the government announced the fertiliser subsidy scheme which would supply cheap fertiliser while advising farmers to put fertiliser purchase on hold to wait for subsidised fertiliser (IRIN, May 2005). Fertiliser importers and retailers failed to order fertiliser stocks since most of producers had been waiting for the cheap fertiliser.

Figure 16[20]
Maize production, import and export in Malawi
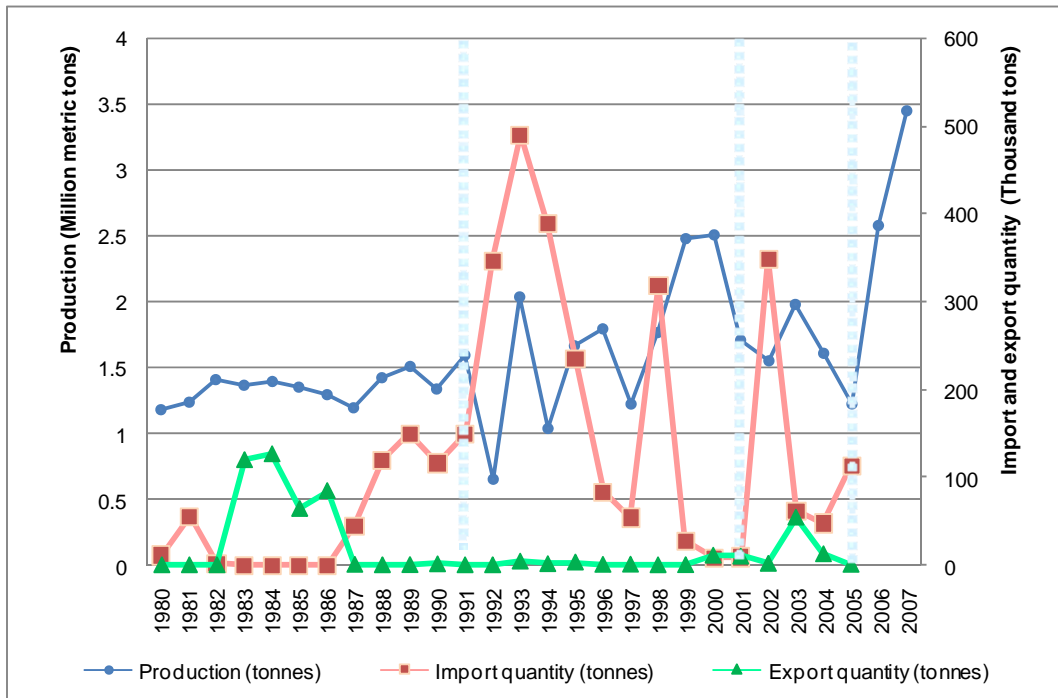
Source: FAOSTAT (September, 2008)

At the beginning of the rain in October 2004, instead of fertiliser subsidy programme, the government decided to implement the Targeted Input Programme (TIP), distributing free farm inputs to two million households (ibid.). However, the FAO/WFP mission pointed out that "fertilisers were delivered too late to be of use [...] while commercially very little fertiliser was available in the markets, which also significantly contributed to the reduced harvest" (FAO/WFP, 2005). Thus, national food production and food availability in Malawi are influenced by not only rains and droughts, but also significantly by fertiliser availability in domestic market; which, in the current context of Malawi, largely depends on the government policy on subsidies.

On the other hand, maize availability related to international trade could be influenced by Strategic Grain Reserve management and private trade of maize, and factors influencing them such as macro-economic policies including price incentives.

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[20] Note that two different scales are used in the graph: Million metric tons is used for production amount on the left axis and 100 thousand metric tons is used for import and export quantity on the right axis i.e. the left axis is almost 10 times larger scale than the right axis.

The influence of management of Strategic Grain Reserve on aggregate food availability can be shown by the case of the food crisis in 2002. In early 2001, the National Food Reserve Agency started selling the SGR, following the advice from IMF and the World Bank (Devereux, 2002), to "reduce the SGR from an 'unsustainable' 165,000 tonnes to 60,000 tonnes" and to repay a debt of MK 1 billion by the NFRA (Stevens, et al., 2002). In the same year, The government failed to secure an adequate amount of grain stock for SGR since it entered local market late and found few sellers. As well, NFRA delayed importing maize which led to less maize import than it planed: "the result was a steady rundown of SGR, from a highpoint of 175,000 metric tons in August 2000 to virtually zero stocks one year later" (Devereux, 2002). This depletion of SGR significantly contributed to the famine of 2002 in Malawi, affecting availability of maize in domestic market in 2001/2002 consumption season, which led to "a severe food crisis" in the year of "a relatively small production shock" (Stevens, et al., 2002)[21]. On the other hand, with proper management, SGR served to stabilise food supplies in domestic market:

> "... during the drought of 1991/92, when despite a more severe production shock than in 2001, ADMARC retained adequate supplies of cereals in its markets at affordable prices" (Devereux, 2002).

With regard to possible influence of the private trade of maize on aggregate maize availability in domestic market, it could contribute to both improving and reducing availability in different contexts respectively.

Private trade facilitates movement of maize from where there is excess of supply to the place suffering from its scarcity through incentives given by the price variation at different locations. On the other hand, it could also reduce maize availability in domestic market in short-term, which is also attributed to a characteristic intrinsic to private trade,: namely, private traders keep their maize stock until the market price is raised in lean season, in order to compensate marketing costs such as cost of transport, storage and labour as well as to gain reasonable profit. This may contributes to temporary reduced maize availability in the domestic market.

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[21] The famine hit Malawi in 2002 was soon after two bumper harvest years in 1999 and 2000, and even harvest in 2001 was "actually high by historical standards" (Stevens, et al., 2002). Besides the depletion of SGR, imports of maize in 2001 were less than 10,000 tonnes (FAOSTAT), the lowest in the past 14 years since 1987, except for the two bumper harvest years. This suggests that the most prominent reason for the 2002 famine could be political reason: mismanagement of SGR and "the complete failure to order the normal volume of imports in a timely manner" (Stevens, et al., 2002).

4.2 Macro changes and individual access to food

Chapter 2 discussed how economic policies and food policies have been reoriented in Malawi and the resulting price variation in maize and fertiliser. In this section, implications of such price changes on individual access to food will be examined.

Implications of fertiliser prices

As shown in section 2.3, the fertiliser price has tripled in the past decade in Malawi. Not only production quantity but also profitability of food production is influenced by such increase in fertiliser prices. Here, we refer to the profitability of fertiliser use i.e. the extra quantity of maize which can be increased by using a unit amount of fertiliser. This is called the value cost ratio (VCR)[22]. It compares the total quantity of extra output produced by a unit amount of fertiliser with their costs. The profitability of fertiliser use, VCR is largely determined by two prices: the maize producer and the fertiliser price. According to calculations in the fertiliser subsidy evaluation report (Dorward, et al., 2008), the 2007/2008 planting season showed a VCR of less than 1, due to high fertiliser prices with relatively lower maize real prices in the post-harvest period. This suggests that using fertiliser is not only unprofitable but even the extra maize output by fertiliser application cannot cover the cost of fertiliser if the maize is sold in the post-harvest period. In other words, it could be better to purchase the same quantity of maize in the market at post-harvest period rather than investing in fertiliser to increase the yield, although a majority of deficit producers would not have cash to purchase maize particularly in the post-harvest period. Besides that high fertiliser prices affect the profitability of production, it also means that real income of the producers who purchase fertiliser would decrease.

In addition, high prices would limit access to inputs by producers who have low incomes. Current fertiliser prices are unaffordable for smallholders to purchase adequate amount for their production, unless they are subsidised. The current government recommendation on fertilise application for hybrid maize is 262kg per hectare[23] and it is translated to 183 kg for 0.7ha, which is the median landholding size of rural households. On the other hand, the national average fertiliser use by households has been 34kg (IHS2, 2005). The commercial fertiliser price in 2005 ranged between MK3000-MK3500 (US$26-30) for a 50kg fertiliser bag (Arya et al., 2005). Given the median cash income

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[22] It is calculated by multiplying 'quantity of crop output per unit of fertiliser' by 'unit price of crop output' and then divide it by unit price of fertiliser; $VCR=O/N*P_o/P_n$ (where O/N is the output produced per unit of fertiliser, P_o is the unit price of the output and P_n is the unit price of fertiliser). VCR of 1 is at least required to cover the cost of fertiliser with extra output. To make fertiliser use profitable, VCR of 2 is required at minimum in general (Morris et al., 2007, op cit., Dorward, et al., 2008).

[23] The recommendation combines two types of fertiliser composed of nitrogen and phosphorous, 175kg and 87kg respectively (Benson, 1999).

of rural households discussed in the preceding chapter, MK7190 (US$63), a majority of rural households are considered to be unable to have access to fertilisers in the commercial market, thereby, locked into food production of low productivity.

Implications of maize prices

As presented in section 2.3, Malawi has been experiencing a steady increase in the maize price. In theory, a rise in food prices affects households differently such as: subsistent-oriented producers (i.e. households who do not access to food market); non-producers and deficit producers (i.e. net food buyers); and surplus producers (i.e. net food sellers). For both deficit and surplus producers, higher food prices mean an incentive for more production and selling their production to the market in order to make profits from higher food prices.

However, as discussed in section 3.1, it is a minority of rural households in Malawi who sells their own produced maize. They are rather depending on market for purchasing maize to supplement their maize production deficit. Based on a household survey by Lobi EPA in 2006 and Agricultural Input Subsidy Survey in 2007, approximately 60 per cent of rural households in Malawi could be considered as deficit producers i.e. net food buyer. Amongst them a vast majority (e.g. 54 per cent of the households in AISS) does not sell any maize but only buy it. This implies that majority of rural households are assumed to be not benefiting from increased maize price but increasingly suffering from it. Even for the minority amongst the deficit producers who is involved in selling maize, the high maize prices they should pay when buying it back would offset the benefit from their maize sales. Moreover, seasonal maize price fluctuation would affect such type of deficit producers. As shown in section 2.3, there is a seasonal price fluctuation in maize prices where the prices go up in pre-harvest period and go down in post-harvest period. Deficit producers who need immediate cash at post harvest time are forced to sell their maize at the lowest price, and buy it back later in the year at much higher prices (Whiteside and Carr, 1997, op. cit., Harrigan, 2007). This has made particularly food deficit producers increasingly vulnerable to food insecurity. Besides, not only food deficit producers, but also any producer regardless of deficit or surplus, who is forced to sell soon after the harvest would be affected by this price fluctuation. For instance, both deficit and surplus producers may sell their maize and buy it back in different time of the year, due to the risk of storing grain on their own, namely, without good storing facilities and insecticides, grains can be easily spoiled within a few months.

Therefore, real income of food deficit producers with no alternative cash source would decrease. Not only reducing their real income, but also the maize price increase would limit direct access to food in markets by low income households. For example, if some deficit producers have no or very little cash to purchase, this would limit access to food in markets by those. Therefore, it is considered that the majority of the rural population in Malawi has been affected by high food prices in terms of household real income and their access to food.

On the other hand, ADMARC's role of food price stabilisation would have worked as a protection of the poor consumer against falling in such impoverishment and food insecurity. However, in practice, operating such consumer subsidies has led to complex food market situation. Since the cost of subsidies has been very high[24], imported maize has been sold by ADMARC sometimes at higher prices than commercial market, while its official maize purchasing prices from the producers have been sometimes lower than that of commercial market (RATES, 2003 and FEWS NET, 2008) [25]. Besides, it is important to remember that consumer subsidies would be difficult "to reach *all* the poor and *only* the poor" (Streeten, 1987). If non-poor population has access to the subsidised food market, the food stock may not be enough for the poor population where "there is a transfer of resources from farmers [the poor maize producers] to consumers of the food [people who are more likely to obtain cash i.e. relatively rich people]" (ibid.).

According to the analysis of welfare impact of food price changes by RIGA[26], if the price of main staple increases at 10 percent, rural households in all income quintiles in Malawi would lose. In the case of the poorest income quintile, there would be -2 per cent average change in welfare (High-level Conference on World Food Prices, 2008).

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[24] For instance, before SAP were adopted in Malawi, fertiliser subsidy accounted for 6 per cent of deficit of government budget (Smith, 1995).

[25] This implies that it has been difficult for the government to subsidise both the consumer price and the producer price due to its budget constraints. Thus, there is "basic dilemma whether to raise prices to encourage production (and benefit poor food producers) or to keep them low to safeguard poor food consumers" (Streeten, 1987).

[26] The Rural Income Generating Activities (RIGA), a joint effort by FAO, the World Bank and American University.

Conclusion

As introduced in Chapter 1, food entitlement is an important concept to understand and analyse household food security in rural Malawi. At the same time, it is also important to look at the cash flow of household through the production, purchase and the sale of their staple food. Policies and external factors can influence the structure in which such a cash flow emerges, thereby also influencing food production, purchase and sale by households.

In other words, the structure of household cash flow can be described as "exchange entitlement mapping", which influences food security in terms of both national aggregate food availability and individual household access to food.

Chapter 2 discussed the evolution of economic policies in Malawi within which food security policies have been re-modelled. The state intervention policies, which characterised the policy after its independence until the adoption of SAP, have raised government revenue to invest in the estate sector in order to facilitate rapid economic growth, while smallholders were not allowed to make profits from export cash crops and agricultural trade. Liberalisation policies originated from the adoption of SAP in 1981 aimed at both addressing Malawi's financial crisis at the end of the 1970s and to facilitate economic growth. However, the response to this reform was not as expected. There have been non- price constraints which limit the supply response of agricultural production to the price incentives created by the reform. State intervention measures have been re-installed frequently counteracting with the liberalisation policies until present. Notably fertiliser subsidies programmes have been intensified in recent years.

Chapter 3 explained that the majority of rural households in Malawi are food deficit producers and more than half of the rural population in Malawi is considered to be dependent on the market for purchasing maize to supplement their food deficit, even without making any sales from their own production. It is also majority of rural households who is cash income-constrained, which prevents them from ensuring both direct and exchange food entitlements. This is explained by the way in which both types of food entitlements are functioning and influenced by prices and household cash income. Regarding direct food entitlements, utilization of household resources – both land productivity and family labour availability – is constrained by cash income, since cash availability of households, partly determines access to agricultural inputs in order to utilize land. At the same time, inadequate cash income forces them to be engaged in casual agricultural labour in critical agricultural season which constrains family labour for household food production. On the other hand, low cash income directly affects their ability to purchase food in markets – namely, the ability to ensure exchange food entitlement.

Chapter 4 discussed how the re-oriented policies and external factors have been influencing both aggregate food availability and individual access to food. Particularly, price variation in fertiliser and maize brought by the policies and external factors have facilitated the transformation of exchange entitlement mapping – the structure of cash flow in which households purchase and sell food staples – as well as the way households utilize their resources for food production. Food price variations have different implications for various types of households such as deficit food producers, surplus food producers and traders. An increased maize price is considered to be facilitating a reduction in the real income of deficit producers, who are the majority of rural population in Malawi, while surplus producers could increase their real income. Seasonal food price fluctuation has been giving opportunities to traders to operate and profit from the maize trade. An increase in fertiliser prices could be seen as reducing the real income of all types of food producers, and at the same time, affecting the profitability (i.e. incentives for surplus food production) and the productivity of food production, thereby contributing to a reduction in aggregate food production output. These changes in household cash income and the price variations in food staples and agricultural input could either improve or worsen both types of food entitlements of households depending on the types of households, since food entitlements are functioning by household cash income to large extent, as well as influenced by prices of food and agricultural inputs.

Most of the non-price constraints influencing on economic growth in a way that liberalisation policies did not assume – such as limiting access to capital and inputs by smallholders as well as their constrained family labour availability – are referred to, or closely related to factors influencing food entitlements. Thus, as the re-oriented polices created an environment where such non-price constraints are not addressed or become worse, similarly, food entitlements of the majority of rural households in Malawi have not improved. In other words, price variation resulted from re-oriented price policies and external factors contributed to altering exchange entitlement mapping, negatively influencing the diversification of exchange food entitlement of rural households, through constraining their cash income. This, in turn, worked as impediment to the efficient utilization of the factors of production by households – through affecting labour availability (i.e. low cash income leads to family members working as casual agricultural labourers in the planting season) and land productivity (i.e. low cash income limits access to fertiliser). In the end this contributed to insufficient household food production, namely, the inability of households to ensure direct food entitlements.

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Annex I

Table 1
Summary of annual cash income of rural households in Malawi
(Integrated Household Survey 2004/2005)

|	Percentiles		
1%	0		
5%	100		
10%	600	Obs	9840
25%	2350	Sum of Wgt.	9840
50%	7190	Mean	21125.24
		Std. Dev.	67141.15
75%	19142.5		
90%	45100	Variance	4.51e+09
95%	78000	Skewness	24.53242
99%	225500	Kurtosis	1137.41

Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005

Table 2
Summary of landholding size of rural households in Malawi
(Integrated Household Survey 2004/2005)

|	Percentiles		
1%	0		
5%	0		
10%	0	Obs	9840
25%	.4	Sum of Wgt.	9840
50%	.71	Mean	4.382379
		Std. Dev.	82.75916
75%	1.21		
90%	1.82	Variance	6849.078
95%	2.43	Skewness	33.07396
99%	5.56	Kurtosis	1246.624

Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005

Figure 17
Income from casual labour by income categories
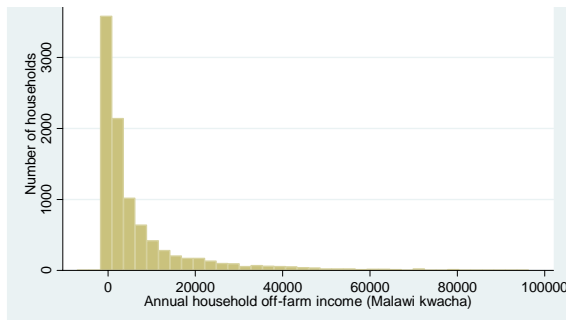### (Integrated Household Survey 2004/2005)
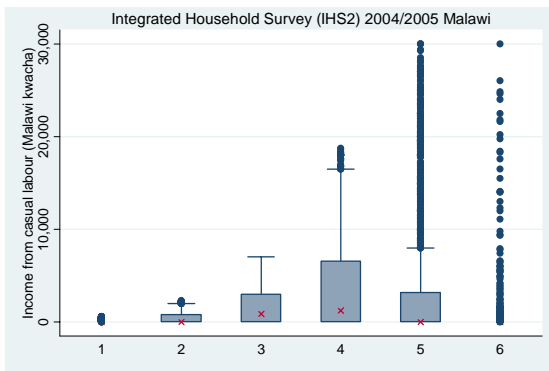
Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005

Figure 18
Income from salary/wages by income categories
(Integrated Household Survey 2004/2005)
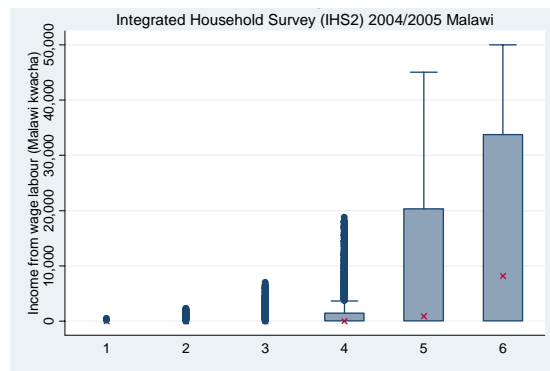
Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005
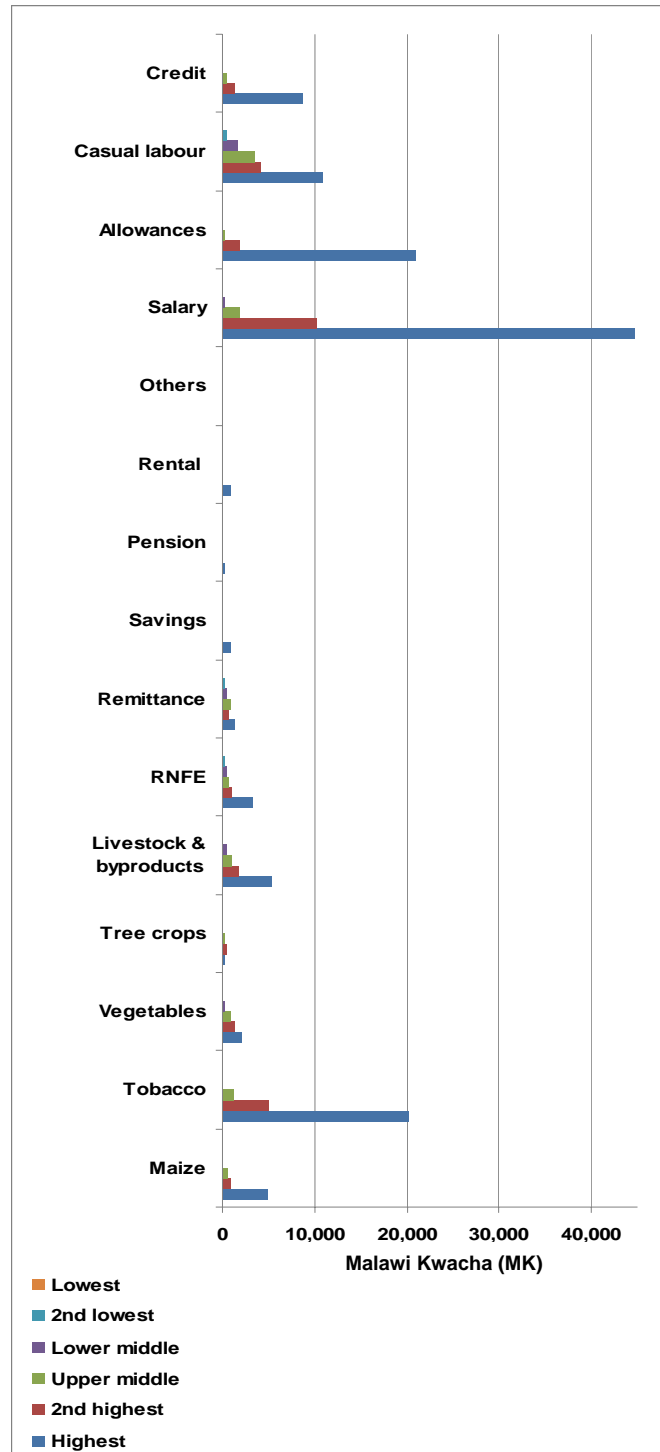
Figure 19
Household annual off-farm income in rural Malawi
(Integrated Household Survey 2004/2005)

Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005

Annex II

Figure 20
Income of rural households from various sources – mean value by income categories

(Integrated Household Survey 2004/2005)

Source: Own elaboration based on Integrated Household Survey (IHS2) 2004/2005