

**MBC Research Series (2)**  
**A Micro Finance Unemployment and Poverty**  
**Reduction Strategy for Sudan (2013)<sup>(1)</sup>**

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**Abstract:**

Employment, be it wage employment or self employment through engagement to one's self undertaking in any sector of the economy agriculture, mining, food crops, small crafts, and the like, has been the first quest for human development because besides being a source of livelihood it creates self-confidence and a sense of worth, generates mental and physical health, and accumulates social capital at the place of work through investing in social relation. In sharp contrast unemployment especially among the youth, besides loss of income from socially and religiously warranted sources like farming, livestock, wage employment and self employment, creates serious social problems that might jeopardize human security. Young unemployed educated people, furnished with advance communication technologies like the face book and smart mobile telephones may always entertain the fanatical ideas of forming groups highwaymen, gangs of robbers and looters, join a regional network of drugs and human traffickers, or even participate in civil wars and other deviances No matter how much sporadic income they gain, these practices remain socially and religiously disgraceful and rather dangerous. Here comes the role of policy oriented research that furnish policy makers with practical solutions regarding the specification of an appropriate employment tool that reduces unemployment and consequently eradicates its negative consequences including poverty. This paper utilizes the concept of the sharing alike ethic that members of a representative household share food and the work effort to attain food alike. In view of this concept the depth of poverty in a representative poor household with unemployed members is an increasing function

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of the number of its unemployed members not only because of the loss of income due to unemployment but also because of the share alike ethic which is an integral part of Sudanese culture. In the absence of a clear national employment policy in Sudan, microfinance which is generally perceived as a tool for poverty reduction via self-employment for income-generating activities remains the only available and perhaps attainable tool for job creation. Microfinance first emerged in the mid-1970s in parallel movements in South Asia and Latin America, most prominently in Bangladesh and Bolivia, respectively. Typically, as in the case of the world-famous Grameen Bank, microloans are extended without collaterals to individuals for income generating activities, which are carried out via self-employment in the informal sector. As a way of circumventing adverse and rather subjective selection for microfinance that prevails in Sudan, this paper focused on the objective identification of poor households with unemployed members for microfinance targeting using an up to date income poverty line and a welfare distribution in which both individuals and households are comparable. At this stage the paper continues to formulate the one way causal relationships between income and poverty, between unemployment and income, and between microfinance and unemployment to specify a general multiple poverty function which is used in the formulation and estimation of the microfinance poverty reduction strategy for Sudan (2013).

### **Introduction:**

Micro Finance is not for everyone and not any type of micro finance reduces unemployment and poverty. The only type of micro finance that reduces unemployment and poverty is the one that is credited to unemployed members of poor households that are objectively identified. To appreciate that this is a necessary and sufficient condition for micro finance to reduce unemployment and poverty, we need to know the process of food poverty at the household level. In the context of the sharing alike ethic that prevails within Sudanese households, unemployed members of poor households certainly share food with other members but remain unable to contribute to household income. Under this state of unbalanced sharing, coupled with a continuous increase in the price of food, poverty at the household level emerges and continues to increase. Thus, the increase in food prices and the

state of unemployment among members of poor households are the main playing factors that squeeze household food budget and speed up the process of poverty generation at the household level. Thus, if micro finance authorities target the unemployed members of poor households who will soon gain additional incomes that, under the sharing alike ethics, will assist poor households to overstep their budget constraints and consequently reduce poverty from the income side. It is worth noting that poverty reduction from the food cost side is beyond the domain of micro finance. One more additional caveat is that for the purpose of poverty reduction the cost of micro finance should be as small as possible and its terms of repayment should be sufficiently soft so that unemployed members of poor households who have no assets other than their redundant human capital and their preserved pride are encouraged to take micro finance credits. If micro finance fails to reach the unemployed members of poor households or fails to be soft enough to be accessible to them as the existing policy may indicate, then poor households have no way out of poverty other than to exchange their pride for food by adopting socially unwarranted poverty coping practices like begging, theft looting, cheating, and the like which are now thick on Sudanese ground. Thus, the necessary and stiffest condition for micro finance to reduce both unemployment and poverty is that it should target unemployed members of poor households with sufficiently soft terms of payments. Now, having explained how microfinance reduces poverty through reducing unemployment among the poor let me proceed with our theoretical and empirical investigation.

For organisational purposes the rest of the paper consists of seven small sections. Section (2) resolved the two fundamental research issues of constructing a food poverty line using February (2013) food prices and a welfare distribution in which both households and individuals are comparable based on 2010 household budget survey data being the recent national data available. Subsequently the section continues to objectively identify the poor in general with emphasis on microfinance targeting purposes and presents empirical results pertaining to aggregate poverty indicators. Section (3) narrates a historical account of how inflationary policies in Sudan generated poverty over the period (1978-2013) and presents empirical results pertaining to changes in poverty over the period (February 2012 - February 2013). Section (4) presents

empirical evidence in support of the huge unutilized human capital of the poor in terms of unemployed members of poor households and their levels of education indicating that the poor are potentially rich. Section (5), contrary to the type of vaguely worded strategies that dominated the seen after the signing of the peace agreement, sets itself the heavy task of formulating and estimating a quantitative microfinance poverty reduction strategy. Section (6) completed the strategy by formulating quantitative monitoring and evaluation devices. Finally section (7) wraps up the discussion.

## **(2)The Identification of the Poor**

Since micro finance is only effective when it is credited to unemployed members of poor households, the first step on the road towards poverty reduction through micro finance is the objective identification of the poor households. However, the objective identification of the poor necessarily requires the resolution of two fundamental research issues, namely the construction of an absolute poverty line and the construction of a welfare distribution in which both individuals and households are strictly comparable

The construction of an absolute poverty in turn requires a definition of poverty. Income poverty is broadly defined as an income inability to attain a minimum standard of living. However, on the other hand such broad definition renders the objective identification of the poor indistinctive simply because the standard of living embraces various welfare components, chief among them is food. Therefore, this broad definition of income poverty should be pruned without loss of generality so that unique and objective identification of the poor becomes easy. We shall therefore start by food as a proxy for the minimum standard of living not only because food is vital for survival but also because it constitutes the major daily item in household budget. Moreover, it is technically easy to prescribe a unique minimum standard of living when food is considered a proxy for that standard of living. The technical easiness stems from the daily minimum calorie intake recommended and calculated by the WHO-FAO technical committee. Thus, the money metric value of the recommended daily minimum calorie intake per person per day is the household daily per capita income that attains the minimum standard of living per person per day (the food poverty line)

when food is considered a proxy for the standard of living.

There are two main methods of computing an absolute food poverty line. The first method which requires data pertaining to itemized household consumption expenditure is based on the calculation of an average cost of a kilo calorie and the multiplication of that average cost by the recommended minimum daily calorie intake per person. The second method involves the prescription of a food basket for an average person per day that is consistent with the current general pattern of food consumption in Sudan and contains the recommended minimum daily calorie intake per person. The inner product of the vector of current food prices by the vector of the prescribed food basket is the absolute food poverty line. Due to unavailability of data pertaining to itemized household consumption expenditure, we adopted the second method using February 2013 food prices. Thus, we are able to construct the absolute food poverty line in Sudan (February 2013) which amounted to SDG 10 per average person per day. In the context of food security, food poverty is synonymous to food inaccessibility which is a sufficient condition for the state of food insecurity.

Now, irrespective of which method of computing the absolute food poverty line a researcher may adopt, an alert reader may inquire about the missing non food welfare components from the computed food poverty line. My response to such legitimate inquiry is that it is technically easy to include the non food welfare components in the computation of the food poverty line by estimating a shifting parameter that shifts the food poverty line upwards to embrace the missing non food welfare components provided that data pertaining to itemized household consumption expenditure is available. In this the computed poverty is a total poverty line that embraces both food and non food components and subsequently exaggerates the incidence of poverty. Be it as it may be, focussing on food poverty provides policy makers with a strong stimulus to reduce poverty because if household total income runs short of feeding its members, then spending on non food welfare components will eventually reduce their food intake further. Furthermore, reducing food poverty is vital for achieving the health MDGS simply because the reduction of food poverty will immediately lead to a reduction in the prevalence of food poverty associated diseases.

Having resolved the fundamental research issue of constructing

the absolute food poverty line, explained how the non food welfare components can easily be added to food for the computation of a total poverty line, and explained the policy specificity of food poverty, let proceed to resolve the second fundamental research issue of constructing a welfare distribution in which both households and individuals are strictly comparable.

Ideally, the poor should be identified and targeted as individuals rather than households because the former will give more room to identify the characteristics of the poor than the latter. We, therefore, need to construct a welfare distribution where welfare is measured by an observable and measurable welfare indicator like household income or consumption expenditure. To neutralize the effect of the head count household size on the welfare distribution, we shall use household per capita income (expenditure) as an observable and measurable welfare indicator. Given the gender-neutral food sharing ethics that prevails within Sudanese households, we are almost sure that household per capita income (expenditure) as an observable and measurable welfare indicator is not gender biased and reflects the true individualistic welfare level. Moreover, to allow for strict comparability of individuals and households in the welfare distribution as measured by the distribution of household per capita income (expenditure), we need to adjust for variations in household demographic characteristics as carefully suggested by Deaton and Muebauer (1980). This adjustment is done by converting the head-count family size into adult male equivalent using a nutrition-based adult equivalent index that converts males and females adolescents, children, and adult females into fractions of an adult male. For the computation of the adult equivalent index see appendix (A) Finally, it is the distribution of the household adult equivalent per capital income (expenditure) that provides the welfare distribution in which both households and individuals are comparable simply because it captures the variations in households head count sizes as well as the variations in households demographic characteristics.

Now, having constructed a food poverty line based on a definition of poverty, and a welfare distribution in which individuals and households are comparable, the identification of the poor becomes as easy as anchoring the poverty line on the welfare distribution as a cutoff point that splits the sample population discretely into poor and non-

poor households in the sense that any household with daily per capita income less than SDG 10 (the food poverty line) is doomed food poor. As such, with reference to the coded questioners, the poor household together with the demographic and socioeconomic characteristics of their members can easily be identified individually by name, address, and telephone number of the head of household. Eventually, members of poor households can also be individually identified by age, sex, level of education, employment status, type of occupation, and any other characteristics a survey may provide. The individual identification of the poor and their socioeconomic characteristics is particularly useful for direct and characteristic targeting like in the case of Zakat, micro finance, and health insurance respectively. However, poverty is usually measured in aggregate terms so that policymakers can set geographical poverty targets and directions.

### **(2.1).The Aggregate Measurements of Food Poverty**

Poverty is always measured in aggregate terms using the Foster-Greer-Thorbecke (1984) (FGT) poverty index. The FGT poverty index which is a family of three poverty measure is given by equation (2.1.1) below

$$\text{EMBED Equation.3} \tag{2.1.1}$$

where  $P\alpha$  is a poverty index,  $n$  is the sample population,  $Z$  is the food poverty line,  $Y_j$  is the household per capita income (consumption expenditure) of poor household member  $j$ , and  $q$  is the number of persons whose individual per capita income (consumption expenditure) is less than the poverty line (i.e. the number of the poor). Finally,  $\alpha$  is the poverty aversion parameter. When  $\alpha = 0$ , equation (2.1.1) is reduced to  $q/n$  as given by the following expression:

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3 Foster, J., J. Greer and E. Thorbecke, "A Class of Decomposable Poverty Measures," *Econometrica*, Vol. 52, No. 3 (1984), pp. 761-766.

P0 in equation (2.1.2) is the incidence of poverty measured by the number of the sample poor as a ratio of total sample population. Sometimes this measure is known as the head-count index of poverty and this is why it is denoted by (H). Therefore, when  $\alpha = 0$ , the FGT poverty index of equation (2.1.2) averts both the depth and severity of poverty and focuses on the head count index of poverty (H) which measures the incidence of poverty.

$$P1 = q/n(1 - \mu/Z) = HI \quad (2.1.3)$$

Where  $\mu$  is the mean income of the poor and  $(1 - \mu/Z)$  is the income gap ratio denoted by I and measures the depth of poverty among the poor. Therefore, when  $\alpha = 1$ , the FGT poverty measure in equation (2.1.3) takes into account the incidence (H) as well as the depth (I) of poverty but averts the severity of poverty.

$$P2 = q/n(1 - \mu/Z) + q/n(\mu/Z)G = H[I + (1 - I)G] \quad (2.1.4)$$

Where, G is a measure of inequality that measures the degree of income (expenditure) inequality among the poor;  $0 < G < 1$ . It is noted from the poverty measure in equation (2.1.4) that when  $\alpha = 2$ , the FGT general poverty measure of equation (2.1.1) captures the three dimensions of poverty namely; the incidence (P0), the depth (P1), and the severity (P2). It is also noted that P2, which might be called total human deprivation in food consumption has two terms. The first term of equation (2.1.4) is the absolute deprivation and the second term is the relative deprivation, which is governed by the degree of income (expenditure) inequality among the poor (G). If the poor are equal in being poor, the inequality index (G) will be zero and consequently, the second term of equation (2.1.4) will vanish indicating that there is no relative deprivation in food consumption. If the poor are unequal in being poor, the inequality index (G) will be greater than zero, yet less than one, and consequently,

the second term of equation (2.1.4) shall remain positive indicating that there is a degree of relative deprivation in food consumption measured by  $H(\mu/Z)G$ , which is the case in real life.

The policy contents of these measurements of poverty include direct targeting and characteristic targeting. For example, income inequality among the poor as measured by  $G$  and, consequently, relative deprivation as measured by  $\{q/n (\mu/Z)G\}$  of the second term of equation (2.1.4) can be reduced by direct transfer to the ultra poor provided that they are well identified. Zakat is a case in point. For a given population size and a given inflation rate, increasing the share of the poor in economic growth (ie making growth pro-poor) will reduce total poverty as measured by equation (2.1.4)

## **(2.2) Identifying the Poor for Micro Finance Targeting:**

Let us recall from the introduction to this research that the role of micro finance is confined to the financing of poor household's food budget deficits through financing income generating projects of unemployed members of poor households. Thus, for micro finance targeting we need to have a list of food poor households with unemployed members as well as the number of unemployed members of each poor household who will be the direct target for micro finance. We also need to know the educational level of each unemployed member of poor household so that the micro finance authorities can identify appropriate micro project for each unemployed member of poor household who is identified to be eligible for micro finance. Most important of all, we need to measure the income gap ratio denoted by  $[1 - Y/Z]$  for each poor household with unemployed members where  $(Z)$  is the food poverty line,  $(Y)$  is a representative poor household per capita income reported to be gained from the standard sources of income that include agriculture, livestock, salaries & wages, remittances, and self employment. Poor household level numerical information on the income gap ratio  $[1 - Y/Z]$ , poor household per capita income, and unemployed members of poor households are vital for the design and computation of our unemployment and poverty reduction microfinance strategy. Furthermore, in view of the before-and-after research methodology, the poor household level numerical information on the income gap ratio can be retained as data base for assessing the poverty reduction impact of micro finance.

Now, after handing in the list of objectively identified poor households with unemployed members to policy makers, there is no convincing excuse for the microfinance authorities not to target these unemployed, educated, poor people with low cost and friendly terms of repayment micro credit as the only feasible way forward to reduce unemployment and poverty simultaneously. It is in the context of this feasible and optimistic way forward that we made the theoretically and empirically plausible assumption of a negative definite causal relationship between microfinance and unemployment. (See subsection 5.2) However, misled by the pessimistic anticipation that the current state of affairs that microfinance authority will continue targeting the rich rather than the unemployed poor indefinitely, some Sudanese critics may find it hard to swallow our plausible assumption unless they review it through the brighter lens of an optimistic way forward. After all, the core of this research suggests a way forward poverty reduction strategy which by virtue of being a strategy it eventually discards the existing poverty generating policies and suggests new poverty reducing policies that can be enacted over a defined span of time. This is what strategic planning is all about.

### *(3) How Inflationary Policies Generated Poverty in Sudan Over the period (1978 - 2013)?*

In a perfect competitive goods market a consumer is a price taker in the sense that he (she) cannot reduce the prevailing food price through bargaining. As such, the consumer ability to buy sufficient food depends on his income. Starting by the fixed income group as a case in point, once fixed incomes fall behind prices as a result of an inflationary policy, poverty and its correlates emerge and the middle class (the salary takers) who used to run the social solidarity machine will gradually be squashed and crowded out the welfare sphere. Subsequently, if that inflationary policy is neither reversed nor supplemented by a subsidy programme, poverty will sneak in the rest of the society unnoticed for years. If another bout of inflationary policy is in place, poverty will cumulatively flare up like cancer in the whole society. Throughout this process of poverty generation the poor, remaining unemployed and too powerless to stand against successive inflationary policies, are forced to adjust to their economic adversity by adopting socially unwarranted practices like begging theft, cheating, looting, and the like.

A brief historical account of the dynamics of the inflationary policy associated poverty in Sudan will reveal empirical evidence in support of the above logic. We all know that while poverty is a continuous variable, economic policy in Sudan has been discrete following the discrete nature of the political regimes. Therefore, the before-and-after policy poverty situation analysis is an ideal approach to attribute poverty to a specific policy. The period (1968-2012) witnessed three waves of socially harmful macroeconomic policies; namely the structural adjustment program (SAP) (1978-1986), the economic liberalization policy (ELP) (1990-1993), and a chain of annual deficit financing policies. In 1978 Sudan government, under pressure of huge external and internal imbalances and severe shortage of foreign curacy, was obliged to accept and implement the International Monetary Fund (IMF) structural adjustment program (SAP). The underlying thinking of the IMF in designing and superimposing SAP was that third world countries were accused of developing unbalanced economic structures with national aggregate demand exceeding national aggregate supply

and the excess demand over supply is usually financed by borrowing from the IMF with less financial abilities to repay the debts.

The poverty generating attributes of SAP include; cuts in public spending, removal of subsidies, and the devaluation of the local currency. These poverty generating attributes of SAP were basically meant to adjust aggregate demand down to the stagnant level of aggregate supply. Thus, the standard IMF structural adjustment program, contrary to the Keynesian thinking (see Keynes, February 1936), focuses on killing the demand side of the economy overlooking to a great extent the supply side. For an economy that already suffers severe supply side constraints, such adjustment policies are not only irrelevant but even more harmful. They resulted in huge internal and external imbalances, economic stagnation, a rise in the general price level, and wide spread poverty.

Now, at the beginning of the inflationary policy free period (1968 - 1978) the urban incidence of poverty, the depth of poverty, and the food poverty line per person per month in 1978 were 15.9 percent, 4.6 percent, and 136 Ls per person per month respectively. Just before the implementation of SAP policies in 1978 the same poverty indicators had increased rather slightly to become 20.5 percent, 8.6 percent, and 777 Ls per person per month respectively. During SAP period (1978 - 1986) the same urban poverty indicators increased from 20.5 percent, 8.6 percent, and 777 Ls per person per month in 1978 to 52.9 percent, 24.4 percent, and 6384 Ls per person per month. Moreover, SAP period (1978 – 1986) was characterized by fast population movement. With the introduction of money in the rural subsistence economy, the rural poor under distress income pushing factors moved to the urban centers in search for sources of livelihood. At that time the rural migrants adopted inferior, yet socially warranted, jobs in the urban informal sector. This is why during SAP period (1978 – 1986) the number of urban poor families increased from 127400 in 1978 to 370000 in 1986. SAP period is also characterized by high rates of brain drain to the rich Arab countries where incomes do not fall behind prices.

However, in the early 1990s the present government of Sudan adopted its own adjustment policies that are believed to be more stringent than the one suggested by the IMF and the World Bank. In addition to this 1992 witnessed the adoption of the famous liberalization policies

embedded in what was called the Economic Salvation Program (ESP). The liberalization policy, besides being a national counterpart to the harmful IMF SAP policies, it in fact liberalized the government from its national public responsibilities by raising hands off the public sector services (education and health) rendering them rather inaccessible to the income poor. Moreover, the liberalization policy liberalized all sectors except the public employment sector where the middle class is employed rendering salaries and wages fall far behind the liberalized goods market prices.

It follows that, as a result of our own harsh adjustment policies coupled with government self liberalization from the two public service sectors (health and Education), the incidence of poverty, the depth of poverty, the food poverty line per person per month, and the number of poor families in urban Sudan had respectively increased from 52.86 percent, 24.38 percent, 6384 Ls, and 370000 poor families in 1986 to 84.43 percent, 47.78 percent, 27000 Ls, and 705000 poor families. (Ali 1994). It is worth noting that the remarkable increase in the number of urban poor family from 370000 in 1986 to 705000 in 1993 can only be attributed to rural – urban migration of poor families. Moreover, the substantial increase in the food poverty line per person per month from 6384 Ls in 1986 to 27000 Ls in 1993 would have created enormous food budget deficits among the urban poor that poor households incomes from socially acceptable practices including the inferior, yet socially warranted, jobs in the informal sector will run short of financing them. Thus, obliged to stay alive, the poor are forced to exchange their pride for food on daily basis by chasing some sporadic income through begging, theft, looting, cheating, and the like.

Furthermore, since the separation of the South and the subsequent sudden loss of oil revenue, the government suffered continuous annual budget deficits. These deficits are invariably financed from the pockets of the people through increasing direct taxes, removal of subsidies, and the devaluation of local currency (the same legacy of SAP). Thus, the government continues to finance annual budget deficits at the expense of creating huge food budget deficits for the millions who are already poor. Consequently, the poor, out of their apathy and despair, and for sheer survival purposes, have no option other than to diversify and intensify their socially unwarranted poverty coping practices.

Now, having computed food poverty lines for February 2012 and February 2013, we are able to produce fresh empirical results pertaining to the effect of deficit financing policies on poverty and the pride of the poor in urban Sudan over the period (2012 – 2013). These results are reported in Table (1) below:

**Table (1): The Effect of the Budget Deficit Financing Policies on Urban Poverty**

The Aggregate Poverty Indicators	2012	2013	Change
The Proportion of Poor HHS (HP) %	25.46	68.65	43.19
The Incidence of Poverty (H) %	30.92	75.44	44.52
The Income Gap Ratio (I)	0.2784	0.4136	0.1352
The Depth of Poverty (P1) %	8.62	31.21	22.59
Income Inequality among the Poor (G)	0.1464	0.2097	0.0633
The Severity of Poverty (P2) %	11.87	40.48	28.61
The Share of Unreported Income S(Y2) %	31.52	40.08	8.56
The Food Poverty Line (Z) SDG	5	10	5

in Sudan (2012 – 2013)

Source: Author's own computation based on 2012 and 2013 food prices and 2010 HHB survey data.

Now, let me, at the outset, explain what might seem to be an inconsistency in the above reported poverty results. The small poverty results in Table (1) seem to be inconsistent with the rising trends of poverty in Sudan since 1978. The main reason for this deceptive inconsistency is that while the computation of poverty for the period (1978 - 1993) is based on household per capita reported income only, the computation of poverty for the period (2012 – 2013) as reported in Table (1) is based on household per capita expenditure which includes both reported and unreported poor households income components where the share of the latter in the year 2012 and the year 2013 is 31.52 percent and 40.08 percent respectively.

The results in the bottom row of Table (1) show that due to the inflationary budget deficit financing policies over the period (2012 – 2013) the poverty line (Z) which is the money metric value of the recommended minimum daily calorie intake per person had increased from 5 SDG in the year 2012 to 10 SDG in the year 2013. Subsequent to this sudden increase of the cost of food per person per day, the proportion of poor urban households increased from 25.46 percent in the year 2012 to 68.65 percent in the year 2013 as shown in the first row of Table (1). Such huge increase in the proportion of poor urban households in such a short period can only be attributed to rural – urban migration of poor households in search for survival in the urban centers where there is more room for the socially unwarranted coping practices. Moreover, as a result of increasing the food poverty line by 5 SDG in one year, the national budget deficit financing policies eventually increased all aggregate poverty indicators in urban Sudan. For instance, bearing in mind that the poverty results in Table (1) are based on household per capita expenditure which includes both reported and unreported income, while the incidence, the depth, and the severity of poverty had respectively increased from 30.92 percent, 8.62 percent, 11.87 percent in the year 2012 to 75.44 percent, 31.21 percent, and 40.48 percent in the year 2013, income inequality among the poor and the income gap ratio had respectively increased from 0.1464, and 0.278 in the year 2012 to 0.2097, and 0.4136 in the year 2013.

At the individual level what worries the poor most is the increase in the

income gap ratio  $\{(Z - Y_j)/Z\}$  where  $Z$  is the money metric value of the recommended daily minimum calorie intake per person (the food poverty line) and  $Y_j$  is poor household  $j$  daily per capita income. For the nontechnical reader let me give a numerical illustration to this important statement. Suppose that in the year 2012 the food poverty line was ( $Z = 5$  SDG) and a representative poor household  $j$  per capita income ( $Y_j = 2$  SDG). Therefore, every member in that representative poor household suffers a daily food budget deficit equal to  $[(Z - Y_j) = (5 - 2) = 3$  SDG]. If the size of that representative poor household is 7 members, then that representative poor household suffers a daily total food budget deficit equals 21 SDG per day. If due to a national budget deficit towards the end of the financial year 2012, the Government adopted inflationary policies that double the prices in the year 2013, the food poverty line ( $Z$ ) will increase from 5 SDG to 10 SDG per person per day, then the daily total food budget deficit of our hypothetical representative poor household  $j$  will suddenly increase from 21 SDG per day to 42 SDG per day. It is this sudden increase in the food income gap ratio that worries the poor most. In this case the poor, economically workless to increase their incomes from socially warranted sources, and politically voiceless to reverse Government policies, are compelled to finance their increasing food budget deficits on daily basis through all socially unwarranted means including begging, theft, looting, cheating, and the like as the only way out of hunger. This is how bad macroeconomic policies reduce the whole mental and physical capabilities of the poor to a daily act of food hunting. This strong statement is empirically supported by the results in Table (1) where the share of unreported income in a representative poor household total income increased from 31.52 percent in 2012 to 40.08 percent in 2013. This increase in the share of unreported income would certainly imply that the poor in an endeavor to finance a sudden increase in their food budget deficits are forced to gain extra incomes by diversifying and intensifying their socially unwarranted coping practices. Thus, consecutive inflationary policies will have the double negative impact of increasing poverty and reducing the pride of the poor.

Moreover, poverty, like an aching tooth, has its own referred pain on other sectors; chief among them is the health sector. The very narrow concept of poverty that it is the lack of income embraces many health related

hazards like insufficient food intake, malnutrition, poor shelter, poor sanitation, ,inaccessibility to clean drinking water, inability to pay for quality health service, inability to pay for education, inability to marry or get married, social exclusion, loss of dignity and self respect, and an awful feeling of helplessness, hopelessness, apathy, and a sensation of aging out. These poverty correlates are the underlying causes of many poverty born diseases. However, in spite of this and more, macroeconomic policy in Sudan since 1978 continued on the one way lane towards poverty generation without making a u-turn towards reducing it. Now, is there any hope that future policies will make that u-turn?

#### **(4) The Untapped Income Potentials of the Poor:**

The poor are in fact potentially richer than many of the non poor but their richness is buried in their own abundant but unutilized human capital. There are many ways for the government to utilize the abundant human capital of the poor; chief among them is the implementation of a microfinance program that targets the characteristics of objectively identified unemployed members of poor households. Due to the lack of such

a microfinance program, the poor in urban Sudan being forced to finance their food budget deficits on daily basis are urged to utilize their human capital in the socially unwarranted coping practices which are the only feasible income generating activities for the poor. However, the adopted coping practices, besides being socially unwarranted, under utilize the abundant human capital of the poor.

Moreover, as far as the national economy is concerned, the human capital of the poor remains an economically dead national asset simply because the poor utilize it in non productive income generating activities. As such, the supply side of the economy will stagnate while the demand side is growing leading to demand push inflation and consequently more food poverty. Therefore, the recommended microfinance program that target objectively identified unemployed members of poor households, will serve the triple purpose of brining life to an economically dead national asset (the redundant human capital of the poor), reducing food poverty, and recovering the pride of the poor. The size of the unutilized human capital of the poor and its dynamics over the period (2012 – 2013) are reported in Table (2) below:

**Table (2): The Unutilized Human Capital of the Poor in Urban Sudan (2012-2013)**

Poverty and Human Capital Indicator	2012	2013	Change	Change %
The Subsample of Urban Households	2459	2459	-	-
The Subsample of urban population	15240	15240	-	-
Total urban years of schooling	42856	42856	-	-
Number of poor urban households	1454	2095	641	44.1
Number of poor urban population	9698	13345	3647	36.6
Urban PHHS with unemployed members	1406	1989	538	38.3
Unemployed urban poor population	4684	6266	1582	33.8
Urban PHHS with educated unemployed members	1218	1709	491	40.3
Educated unemployed poor population	4361	5813	1452	31.8
Total years of education of the unemployed poor	26514	36464	9950	37.5
The food poverty line (Z) SDG	5	10	5	100

Source: Author's own computation based on 2009 HHB survey data

Note: PHHS = Poor households

The results in row (2 – 3) of Table (2) are subsample results from 2009 households' budget survey data. The remaining results pertain to the size and dynamics of poverty and the associated human capital of the poor which includes the number of unemployed members of the poor and their levels of education. The best way to read the story of Table (6) is to associate the results in column 3 starting with the intersection of row 4 with column 3 with the results in the bottom row.

Now, as a result of the sudden rise in food prices due to budget deficit financing inflationary measures taken by the government towards the end of the financial year 2012, the food poverty line (Z) which is the cost of food per person per day increased from 5 SDG in 2012 to 10 SDG in 2013. Consequently, 641 urban household with total household members of 3647 persons who were at the edge of poverty in the year 2012 had fallen over in poverty in the year 2013. Moreover, the results show that 1582 of the 3647 persons who slipped in poverty are unemployed although they have a total qualification of 9950 years of education already invested in them. It follows that in the year 2013 while 87.6 percent of the urban populations are poor, 47 percent of the urban poor are unemployed in spite of the fact that they received 85.1 percent of urban education. This is how Sudan economy has been devastated by unemployment and inflation which have retarded economic growth, worsen income distribution, increased poverty and social inequality and erupted regional conflicts. Nonetheless, there are many policy options for the government to unchain the huge income potentials of the poor, reduce poverty, and recover the pride of the poor. Chief among these policy options is the microfinance program that targets the unemployed members of poor families. Next section is an attempt to sketch a microfinance poverty reduction strategy.

## **(5) A Microfinance Poverty Reduction Strategy:**

### *(5.1) The Theoretical Link between Microfinance and Poverty Reduction:*

In principle the first step towards the design and implementation of any strategy is the specification of a causal relationship between a specific goal and a set of policy variables that should be manipulated by the right magnitudes and in the right directions towards achieving that goal. In the case at hand the goal is poverty reduction and the policy

variables are food price and microfinance. Now, how poverty reduction links with food price and microfinance in a causal relationship? To answer this fundamental question we need to identify the determinants of poverty at the household level.

In the context of the share-alike ethics that prevail within households in Sudan, members of a representative household share food and work effort to attain food alike. However, under the current state of food poverty and the high rate of unemployment among the poor, unemployed members of a poor household who are unable to contribute to household income are ethically not denied their equal share of food. Thus, unemployment among the poor increases the depth of poverty through decreasing household per capita income. It follows that for a given cost of food, microfinance reduces unemployment among the poor, increases poor households per capita incomes, and eventually reduces the depth of poverty. This causal link between poverty and microfinance can easily be expressed mathematically by the following model. Since, prices are not expected to remain the same; the model will also embrace the causal link between poverty and food prices.

The Notations Used

- Z = the food poverty line in SDG
- P = the level of food prices
- Y<sub>j</sub> = poor household j per capita income.
- I<sub>j</sub> = [1 - Y<sub>j</sub> / Z] the depth of food poverty in poor household j
- U<sub>j</sub> = number of unemployed members of poor household j
- M<sub>j</sub> = microfinance credited to unemployed members of poor household j

### **(5.1.2).The Model:**

$$I_j = IJ\{Z(P), Y_j[U_j(M_j)]\} \quad (5.1.2.1)$$

With  $I_Z > 0$ ,  $Z_P > 0$ ,  $I_Y < 0$ ,  $Y_U < 0$ , and  $U_M < 0$

Expression (1) above links the depth of food poverty (I<sub>j</sub>) in poor household j with the two counteracting determinants of poverty, namely, the inflationary policy that increases the depth of food poverty through increasing the cost of food (Z) and the microfinance policy that directly reduces unemployment among the poor (U) to increases

poor household per capita reported income (Y1) gained from socially warranted sources, and subsequently reduces the depth of food poverty (I) Thus, on the one hand, the depth of food poverty (I) is an increasing function of food price (P) and on the other hand, it is a decreasing function of microfinance (M) that is actually released to unemployed members of poor households (U). This is well indicated by the signs of the partial derivatives of function (5.2.1),

To take the analysis a step further, let us transform the general poverty function of equation (5.2.1) into its additive separable growth form. Now, taking the total logarithmic differential of the general poverty function of equation (5.2.1) and rearranging terms, its growth form is given by the following expression:

$$G(I) = \alpha\beta G(P) + \delta\theta\eta G(M) \quad (5.1.2.2)$$

While  $\alpha\beta$  (positive) is the total price elasticity of poverty which says that a one percent increase in food price (P) increases the depth of food poverty (I) by  $\alpha\beta$  percent because it increases the cost of food (Z) by  $\beta$  percent and a one percent increase in the cost of food (Z) increases the depth of food poverty (I) by  $\alpha$  percent,  $\delta\theta\eta$  (negative) is the total microfinance elasticity of poverty which says that a one percent increase in microfinance (M) reduces the depth of food poverty by  $\delta\theta\eta$  percent because a one percent increase in microfinance that targets the unemployed members of poor households reduces unemployment (U) among the poor by  $\eta$  percent and a one percent reduction in unemployment among the poor increases poor household per capita reported income (Y1) by  $\theta$  percent but a one percent increase in poor household per capita reported income reduces the depth of food poverty (I) by  $\delta$  percent

If we denote  $\alpha\beta$  by  $y$  and  $\delta\theta\eta$  by  $\lambda$ , expression (5.2.2) will be reduced to the following simple expression:

$$G(I) = y G(P) + \lambda G(M) \quad (5.1.2.3)$$

While  $y$  (positive) is the food price elasticity of the depth of food poverty,  $\lambda$  (negative) is the microfinance elasticity of the depth of food poverty. Expression (5.2.3) says that while a 1 percent increase

(decrease) in food prices increases (decreases) the depth of food poverty by  $\gamma$  percent, a 1 percent increase in the microfinance that is credited to unemployed members of poor families reduces the depth of food poverty by  $\lambda$  percent.

Now, having decomposed the growth rate of poverty into a price effect and an income effect, at least at the theoretical level, the first term (positive) represents the inflationary policy effect on poverty and the second term (negative) represents the microfinance policy effect on poverty provided that microfinance is credited to the unemployed members of poor households. This is how the two policies are contradictory in the sense that while the former increases poverty the latter reduces poverty. As such, if the forthcoming microfinance poverty reduction strategy is not well insulated from the heat of inflation by either a price policy that suppresses the growth rate of food prices, or a blanket of food subsidy, poverty and microfinance will grow apart. Such paradox has characterized the attempts to reduce poverty in Sudan for quite a long time. For instance, since 1990 the government has established numerous funds that has been designated the task of reducing poverty in Sudan. Chief among these establishments is the Zakat fund. However, since that time poverty has been increasing at an increasing rate. The possible explanation of such a paradox is either these funds continue to be leaky buckets or the inflationary positive effect on poverty is greater than the negative effect of these funds on poverty.

It is well known that strategic planning is neither a vaguely worded vision nor a set of fragmented political slogans as untrained politicians may think. It is a well calculated development process that kicks off from a quantitative platform of development backlog to achieve a neatly defined quantitative national goal. By way of analogy, a strategy is a calculated development race between two quantitatively identified racing poles. This is why the use of mathematic is vital in avoiding the design of a vaguely worded strategy that renders the follow up and evaluation impossible and opens a wide door for corruption.

In the context of our model, the numerical value of equation (5.12.3), where the depth of food poverty growth rate  $\{G(I)\}$  is decomposed into two determinants namely; food price effect  $\{\gamma G(P)\}$  (positive) and the microfinance effect  $\{\lambda G(M)\}$  (negative), represents the kicking off platform for the depth of food poverty reducing strategy. Given the

numerical values of  $\gamma$  and  $\lambda$  which can easily be estimated, the food price growth rate  $G(P)$  and the microfinance growth rate  $G(M)$  remain the main policy variables that can be gradually manipulated in the right directions and magnitudes to reduce the depth of food poverty rate from its current size  $G(I)$  to a nationally set goal  $G^*(I)$   $\{G^*(I) < G(I)\}$  over a defined span of time. As such, the food price current growth rate  $G(P)$  should be decreased to a nationally set target denoted by  $GT(P)$  and the microfinance growth rate should be increased to a nationally set target denoted by  $GT(M)$  such that when the two targets are reached, the national poverty reduction goal  $[G^*(I)]$  is achieved. This is what strategic planning is all about.

Now, if equation (5.2.3) is the start racing pole from which the poverty reducing strategy takes off towards achieving the national poverty reduction goal  $G^*(I)$  through the implementation of carefully designed food price and microfinance policies, expression (5.2.4) below is the end racing pole where the two targets  $GT(P)$  and  $GT(M)$  are reached and eventually the national poverty reduction goal  $G^*(I)$  is achieved.

$$G^*(I) = \gamma GT(P) + \lambda GT(M) \quad (5.1.2.4)$$

Rearranging the terms of equation (5.2.4) the microfinance target  $GT(M)$  is given by the following expression:

$$GT(M) = (1/\lambda) G^*(I) - (\gamma/\lambda) GT(P) \quad (5.1.2.5)$$

## **(5.2). the Empirical Investigation:**

Equation (5.1.2.2) and consequently equation (5.1.2.3) can easily be estimated using the following set of log linear and semi log linear econometric models:

$$\begin{aligned} (1) \quad \text{Ln } I &= \alpha_0 + \alpha \text{Ln } Z + \mu_1 \\ (2) \quad \text{Ln } Z &= \beta_0 + \beta \text{Ln } P + \mu_2 \\ (3) \quad \text{Ln } P &= \alpha_0 + \alpha T + \mu_3 \\ (4) \quad \text{Ln } I &= \delta_0 + \delta \text{Ln } Y + \mu_4 \\ (5) \quad \text{Ln } Y &= \theta_0 + \theta \text{Ln } U + \mu_5 \\ (6) \quad \text{Ln } U &= \eta_0 + \eta \text{Ln } M + \mu_6 \\ (7) \quad \text{Ln } I &= \Omega_0 + \Omega H + \mu_7 \end{aligned}$$

Let me note that while ( $d_t$ ) and ( $\Omega$ ) are rates of growth over time and poor households respectively, the remaining six parameters are elasticities. Now, applying the subset (1) – (3) of the above set of log linear and semi log linear econometric models to a mixed cross sectional and time series data pertaining the depth of food poverty (I) cross poor families, food price (P), the poverty line (Z) over time, and applying the remaining subset (4) - (7) of the above set of log linear and semi log linear econometric models to cross sectional data pertaining to the depth of food poverty among poor households (I), poor households reported per capita income gained from socially acceptable economic activities (Y), the number of unemployed members of poor families (U), poor household ranking (H), the empirical results are reported in the following corresponding regression equations:

R1	Ln I	=	3.4	+	0.11 Ln Z		
	T-ratio		(22.1)		(5.5)	R2	= 0.69
R2	Ln Z	=	4.17	+	1.03 Ln P		
	T-ratio		(14.2)		(13.3)	R2	= 0.98
R3	LnP	=	-0.21	+	0.28T		
	T-ratio		(8.1)		(15.8)	R2	= 0.92
R4	Ln I	=	6.34	-	0.5 LnY		
	T-ratio		(38.9)		(11.5)	R2	= 0.79
R5	Ln Y	=	5.53	-	0.58 Ln U		
	T-ratio		(8.4)		(2.3)	R2	= 0.89
R7	Ln I	=	1.01	+	0.04 H		
	T-ratio		(9.4)		(24.1)	R2	= 0.86

Now, let me quickly note that beside the statistical robustness of the results that the seven estimators are statistically significant and the explanatory powers of the seven models are reasonably high, the theoretical signs of the partial derivatives of equation (5.1.2.1) are proved to be empirically correct. This implies that our specification of the poverty function of equation (5.1.2.1) is theoretically correct and thick on ground. Unfortunately, we could not estimate the log linear econometric model (6) which relates unemployment among the poor (U) to microfinance (M) simply because data pertaining to microfinance that is actually credited to unemployed members of poor families does not exist in Sudan. We, therefore, have to resort to the plausible

assumption that the microfinance elasticity of unemployment among the poor is almost negative definite (ie  $\eta = -1$ ).

The theoretical and empirical plausibility of this assumption is based on the optimistic way forward that the government will adopt this microfinance unemployment and poverty reduction strategy and start targeting the objectively identified unemployed members of poor families with low cost and friendly terms of repayment micro credits. As such, this justified plausible assumption should not be clouded by being viewed through the dim lens that the government, even if it is furnished with objectively identified unemployed members of poor families, will continue overlooking the poor as some pessimistic Sudanese critics may believe. With this qualification let me proceed with my empirical estimation of the strategy.

Now, substituting for  $\alpha = 0.11$ ,  $\beta = 1.03$ ,  $\delta = -0.5$ ,  $\theta = -0.58$ , and  $\eta = -1$  in equation (5.2.2), and subsequently in equation (5.2.3), we have the following estimate for the growth rate of the depth of food poverty in urban Sudan:

$$G(I) = 0.113 G(P) - 0.29 G(M) \quad (5.1.2.6)$$

The results in expression (5.2.6) say that while a 1 percent increase (decrease) in food prices increases (decreases) the depth of food poverty by 0.113 percent, a 1 percent increase in the microfinance that is credited to unemployed members of poor families' decreases the depth of food poverty by 0.29 percent.

Moreover, substituting for  $\gamma = 0.113$  and  $\lambda = -0.29$  in equations (5.2.4) and (5.2.5), the estimating equations of the microfinance poverty reduction goal  $\{G^*(I)\}$  and the microfinance strategic target  $\{GT(M)\}$  are given by the following expressions respectively.

$$G^*(I) = 0.113 GT(P) - 0.29 GT(M) \quad (5.1.2.7)$$

$$GT(M) = 0.39 GT(P) - 3.5 G^*(I) \quad (5.1.2.8)$$

Furthermore, regressions R3 ( $d_r = 0.28$ ) and R7 ( $\Omega = 0.04$ ) provide estimates of the current depth of food poverty (I) growth rate  $G(I) = 0.04$  and the food price growth rate  $G(P) = 0.28$ . Having successfully

completed the theoretical and empirical investigations, the microfinance poverty reducing strategy is now ready for implementation.

However, some policy questions remain unanswered, namely, by how much should the current food price growth rate  $\{G(P) = 0.28\}$  be suppressed in order to insulate the microfinance food poverty reducing strategy from the heat of inflation?, and by how much should the current depth of food poverty growth rate  $\{G(I) = 0.04\}$  be reduced to the level of a desired and feasible national poverty reduction goal?, and finally, how long is the span of time over which the strategy can be implemented? Now, once the necessary numerical answers to these policy questions are provided, the targeted growth rate of microfinance that should actually be credited to the identified members of poor households  $\{GT(M)\}$  can easily be estimated using equation (5.2.8).

The necessary numerical answers to the above policy questions should ideally be made by the policy makers with some technical support from the author if needed. This is so simply because the policy makers by virtue of being the ultimate owners of the strategy and accountable for its impact, are the persons who apply the cost-benefit analysis to weigh the socio-political benefit of the strategy against the economic cost of implementing it. Since there is no harm in imitating a policy maker, let me provide exploratory numerical answers to some of the above policy questions by suggesting the following two main policy options

One feasible strategic policy option is to slow down food price growth rate from its current value of 0.28  $\{G(P) = 0.28\}$  to a strategically targeted zero rate  $\{GT(P) = 0\}$ . In less technical terms, we suggest that the price policy should pave its way in the right direction and by the planned pace towards the state of price stability.

Having suggested price stability as a strategic price target, we need to suggest a numerical national poverty reduction goal that can be achieved by the upward manipulation of the microfinance policy variable being the prime mover of the strategy. We, therefore suggest that the growth rate of poverty should be reduced from its current value of 0.4  $\{G(I) = 0.04\}$  to a nationally set poverty reduction goal of - 0.4,  $\{G^*(I) = - 0.04\}$ .

Now, substituting the numerical value of the strategic price target that  $\{GT(P) = 0\}$  and the numerical value of the set national poverty reduction goal that  $\{G^*(I) = - 0.4\}$  in equation (5.2.7) and equation

(5.2.8) respectively, the numerical value of the strategic microfinance target  $GT(M)$  is given by equation (5.2.9) below:

$$GT(M) = 0.14 \quad (5.1.2.9)$$

Now, we are left with the interpretation of the strategic process toward achieving the numerically set national poverty reduction goal of  $\{G^*(I) = -0.04\}$ . If over a defined span of time the current numerical price growth rate is gradually suppressed towards its strategically targeted numerical value of  $\{GT(P) = 0\}$  and if the current numerical microfinance growth rate is simultaneously and gradually increased towards its strategically targeted numerical value of  $\{GT(M) = 0.14\}$ , then and only then the numerically set national poverty reduction goal of  $\{G^*(I) = -0.04\}$  will be achieved provided that microfinance is actually credited to the objectively identified unemployed members of poor household and nobody else. Moreover, since the ‘if’ condition may or may not be met, we need to govern the implementation of the strategy by computing numerical monitoring and evaluation devices. Again, this is what strategic planning is all about.

### **(6) Monitoring and Evaluation:**

Before I embark on the derivation of the technical monitoring and evaluation devices, let me state that crediting microfinance to unemployed members of poor households is the most important monitoring component without which the whole strategy will collapse even if the implementation follows the right time path towards the national poverty reduction targets.

Now, if  $P_t$  denotes the food price at year  $t$  of the strategy and  $P_{t-1}$  denotes the food price at the previous year of the strategy, then the time path of  $P_t$  towards the national set food price target  $\{G^T(P) = 0\}$  is given by the following expression:

$$P_t = P_{t-1}(1 - r^P)^t \quad (6.1)$$

Rearranging terms the planned annual rate at which the food price should be decreased ( $r^P$ ) in order to reach the nationally set food price target  $\{GT(P) = 0\}$  is given by the following expression:

$$r^p = \{1 - (P_t / P_{t-1})^{1/t}\} \quad (6.2)$$

if the actual annual rate at which the food price is reduced is equal to the planned rate ( $r^p$ ) of expression (6.2) throughout the planned span of time ( $t$ ), then the implementation of the food price policy will pave its way in the direction at the right rate towards the nationally set food price target  $\{GT(P) = 0\}$ .

Similarly, if  $M_t$  denotes the microfinance that is actually credited to unemployed members of poor households at year  $t$  of the strategy and  $M_{t-1}$  denotes the microfinance at the previous year of the strategy, then the time path of  $M_t$  towards the nationally set microfinance target  $\{GT(M) = 0.14\}$  is given by the following expression:

$$M_t = M_{t-1}(1 + r^p)^t \quad (6.3)$$

Rearranging terms, the planned annual rate at which microfinance should be increased in order to reach the nationally set microfinance target  $\{GT(M) = 0.14\}$  is given by the following expression:

$$r^p = \{(M_t / M_{t-1})^{1/t} - 1\} \quad (6.4)$$

if the actual annual rate at which the microfinance is increased is equal to the planned rate of increase ( $r^p$ ) of expression (6.4) throughout the planned span of time ( $t$ ), then the implementation of the microfinance policy will pave its way in the right direction at the right pace towards the nationally set microfinance target  $\{GT(M) = 0.14\}$ . Needless to say that the span of time ( $t$ ) over which the strategy should be implemented is left for the government to decide upon because it is based on the government political will and the availability of microfinance resources. As a summary of the above discussion, if the implementation of the required food price and microfinance policies simultaneously follow the time paths given by equations (6.1) and (6.3) at the planned rates of equations (6.2) and (6.4) respectively, then at the end of the announced strategy span of time, the planned national strategic price target  $\{GT^p = 0\}$  and the nationally set microfinance strategic target  $\{GT(M) = 0.14\}$  of equation (5.1.2.9) will be timely and simultaneously reached and subsequently the planned and declared national poverty reduction goal

$\{G^{*(1)} = - 0.04\}$  will be achieved within the announced span of time. Contrary to the fashionable vaguely worded 5-year strategic plans that dominated the scene after the signing of the peace agreement, open wide doors for corruption, and ended up without achieving anyone of the declared national goals, our sample of a quantitative strategic planning which is equipped with check points quantitative monitoring and evaluation devices, avoids unnecessary implementation delays and safeguards the financial resources against corruption.

### **(7) Summary and Conclusions:**

The main poverty reducing policy concern of this paper is the objective identification of poor household with unemployed members so that microfinance can target the right people to achieve a specific national poverty reduction goal through job creation among the poor. Moreover, the objective identification of poor households with unemployed members generates valuable data pertaining to poor household level depth of poverty, number of unemployed members, their educational attainment, and other demographic characteristics. This data is used in the estimation of an additive separable poverty growth equation with a negative price effect and a positive income effect through microfinance being an exogenous policy variable. The estimated poverty growth equation represents a kick off racing pole of a microfinance poverty reduction strategy that sets a food price and a microfinance national targets  $[G^T(P)$  and  $G^T(M)$  respectively] and directions over a specific span of time. For demonstration purposes the author suggest that at the end pole of the development race food price should reach a state of stability  $[G^T(P) = 0]$  and the growth rate of microfinance that is actually credited to unemployed members of poor households without collaterals should reach 14 percent. Furthermore the paper furnishes the implementers of the strategy with food prices and microfinance monitoring and evaluation devices with the view to assess the process of development towards the set poverty reduction target and safeguard it against possible financial corruption.

Besides the empirical results the dynamic of food poverty over the period (February 2012 – February 2013) and the empirical assessment of the unutilized human capital of the poor, the main conclusion of this paper is that over the strategy span of time the growth rate of food price

is gradually suppressed towards its strategic target of price stability [ $G^T(P) = 0$ ] and microfinance that is actually credited to unemployed members of poor households without collaterals grows gradually towards its strategic target of  $G^T(M) = 0.14$ , then the current growth rate of the depth of poverty at the household level [ $G(I) = 0.04$ ] will be gradually reduced towards its national poverty reduction goal of [ $G^*(I) = - 0.04$ ]

*Appendix (A)*  
*The Adult Equivalent Index*

To construct a nutrition-based adult equivalent index, we first computed the recommended daily minimum average energy and protein requirements for each of the six age/sex groups using information from the energy and protein requirements (EPR) reports of the joint FAO/WHO expert group. The elements of the index are the recommended daily minimum average energy and protein requirements for children, adolescents, and adult female calculated as fractions of the recommended daily minimum average energy and protein requirement for the adult male as shown in the following Table:

The Adult Equivalent Index

Age and Sex	Males	Females
Children (0 – 10)	0.55	0.48
Adolescents (10 – 19)	0.95	0.79
Adults (20 & above)	1.00	0.75

Source: based on the Energy and Protein Requirements, (the Joint FAO/WHO Expert Group)

We used these fractions to reduce the head count family size to an adult equivalent by converting children, adolescents, and adult females into fractions of an adult male. Thus, the distribution of the adult equivalent household per capita income (expenditure) captures the variation in both family size and household characteristics. This is why both households and individuals are strictly comparable in the distribution of household per adult equivalent income (expenditure)

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