Some Aspects of Correlation of Physical Capital and Infrastructures on Household Food Security: Evidence from Rural Tanzania

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Abstract

To achieve the first Millennium Development Goals is still a challenge. The problem of poverty in the context of hunger still persists in Tanzania. Household's members have not sustainable access to enough and quality of food. The major objective of this study is to ascertain whether exists some aspects of correlation between physical capital and infrastructures on the households` food security.

This study was carried out in rural part of Tanzania, in Mvomero district covering three villages selected randomly (a total sample 0f 382 households). Data analysis was done using SPSS version 15.0. Chi-square test was adopted for plausible analysis assesses the extent to which some correlation exists between food security status of the households against independent variables (physical capital and infrastructures of the households).

Based on the data analyzed empirically, it is remarkable by evidence that variables such as pesticides ($\chi^2 = 6.963; \, p-value = 0.008$), tractors ($\chi^2 = 10.024; \, p-value = 0.002$) and electricity ($\chi^2 = 13.343; \, p-value = 0.000$) were found to be statistically significant correlated with household's food security in the study area.

In view of these findings, there is a need to pay attention supporting rural farmers' to be able to access farm inputs because of existing some correlation with the household food security status. Finally, this study recommends further study to be carried by incorporating advanced statistical model such cluster analysis, principal components and factor analysis which deals with large data for plausible and interpretable findings.

Key words: Correlation, Physical Capital, Infrastructures and Food Security

1. Introduction

Food security is a wide terminology. It can be defined differently by a number of organizations around the world. The fundamental definition of food security is that it refers to the extent to which individuals are able to obtain adequate food on a day-to-day basis. Internationally perspectives, the term food security are defined as the ability of people to secure satisfactory food. The detailed definition has articulated by the scholars as the admittance by all people at all times to an adequate amount of food for an energetic healthy life (Anderson, 1990).

Also Anderson (1990) managed to make a distinction between food security at nationwide and household level. This dissimilarity found to be crucial because there are different approaches used to evaluate food security in those levels. At national level, food security refers to the condition whereby the nation is capable to produce, bring in, keep hold of and maintain food needed to support its population using minimum per capita nutritional values. Also at the community it is termed as the state whereby the inhabitants in a particular community can be able to obtain secure, culturally acknowledged, nutritionally ample diets throughout a sustainable system such that the community can maximize self reliance. However, at the household level food security can be defined as the availability of foodstuff in someone's home and be able to access. Thus, a household is considered as food secure when the members of the family are living out of fear of hunger.

According to Food and Agricultural Organisation (FAO, 2008) report indicates that international estimates of people facing persistent hunger amplified considerably over the period 1990 to 2007. This report also articulated that an increase in numbers of chronically starving people resulted to increased food prices worldwide due to lower production of staple food like cereals approximately the world.

Maxwell and Frankenberger (1992) pointed out that, the conception of food security has got both spatial and temporal scope. The idea of spatial dimension refers to the extent of aggregation at which food security is being well thought-out. Basically it is feasible to scrutinize food security at global level, continental wise, national, sub-national, village, household as well as individual level. In the context of the temporal perspective it refers to the time frame over which food security is being measured. In much of the food security literature, a distinction is drained between chronic food insecurity as the incapability for a household to meet food requirements continuously whereas transitory food insecurity refers to the failure of the member of the household to meet food needs on temporary basis).

Dercon (2001: 16−19), argued that "in order for individuals and households to sustain living they must possesses

assets in form of capital like labour, human , physical as well as social). These possessions are used to create income in several forms, together with income and profits to possessions, sale of possessions, transfers and remittances. As an alternative to spending households normally actively build up these assets in form of cash. Normally it is possible to access to dimensions of well-being once you have cash in hand.

Epidemic diseases such HIV/AIDS has direct impact to food security. This is because individual affect direct households assets. Instead of these assets to be used as alternative to food consumption, the erupted diseases deplete them being it capital in form of finance, human, natural, physical and social). Instead of these assets to act as a shock absorber during hunger period, it is used as an alternative to treat the emerged diseases (Stokes, 2003: 2).

There are diverse theoretical and abstract frameworks and literatures that are being drawn ahead to comprehend the crash of HIV/AIDS on food defense. The most commonly used framework is what we call sustainable livelihood framework (Stokes 2003; Gillespie and Loevihnsohn 2003; Haddad and Gillespie 2001). Mostly in the literatures the HIV/AIDS and food security literature has also drained greatly on the widespread literature on coping strategies (Corbett 1988; Davies 1996).

Asset such as livestock can possibly be considered as a form of investments. Thus it can be regarded as financial or physical capital. Some of the households affected by AIDS have been observed to turn to livestock production as an alternative to crop production when soils become unproductive and crop management practices too demanding for the available labour (White and Robinson 2000 citing in FAO, 1995).

On the other hand, households sell cattle more frequently to cover medical bills and interment expenses. This trend has also been well-known whereby households raise smaller stock such as pigs and poultry, a much less labour rigorous activity. This shock of disease affects direct the households to be in a state of failure to cover food requirements (White and Robinson 2000)

Wiebe et al.(2001) pointed out that an expected increase in output based improved infrastructure and price policies were intricated to measure, but such improvements were probably fundamentals to make an increases in productivity from the make use of conformist inputs and research. This was articulated in the study on Agricultural policy, Investment and Productivity in sub-Sahara Africa (SSA). Other constraints to agricultural productivity were the value and ease of use of education, do research and extension services, as well as institutional uncertainties that weaken incentives to invest in the maintenance or improved of land superiority. The study concluded that education of rural labour force and agricultural research is needed to improve the future prospects for productivity growth in SSA. Furthermore it was argued that assets such as livestock, fertilizer, and non-conventional inputs have also changed, contributing to an estimated 11.3 per cent annual increase in total factor productivity between 1961 and 1991. Further analysis projects that food production in SSA would have to grow at a rate of 3.3 per cent to 4.5 per cent annually to maintain per capita consumption levels or meet nutritional requirements over the next decade.

It was observed that Africa has more countries with food insecurity problems than any other region of the world and sub-Sahara Africa is the most vulnerable region (FAO, 2004). Despite the fact that food is important to human beings, the standard number of meals per day is not met within most households (TDHS, 2005).

Basically, there is the problem of food security in the world since food is unevenly distributed. The importance of food as a basic necessity of life is seen in the fact that it is the basic means of sustenance in terms of quantity, quality as well as productive healthy life. It is sad to note that many people in Tanzania are unable to secure an adequate diet and other basic needs (Aboud, 2001). Most of the researchers who addressing food security put much focuses on demographic variables and financial aspects on how they do affect household's food security (Paddy, 2003; Haile et al, 2005; Kaduma, 2006; Quisumbing and Meinzen-Dick (2001); Zeller and Sharma, 2000). This paper is strictly focussing to address some aspects of correlations of physical capital and infrastructures on household food security.

2. Literature review
One of the qualities of researchable problem is the availability of relevant literature review. In this paper, the related works have been clearly articulated to bring a base for plausible discussion of the findings. Each of the correlate has been addressed as follows:

2.1 Access to infrastructure/farm inputs

Normally, farm inputs contribute positively and increase productivity is applied properly to agricultural activities. Thus, the contributions of these farm inputs to crop production also have a positive effect towards household food security (Getachew, 1995). In this paper, farm inputs use was valued based on the extent to which a household in particular applies the farm inputs or not such as fertilizers, improved seeds, pesticides and other agricultural equipments.

2.2 Electricity

Household accessibility to electricity is another strapping indicator of household wellbeing in terms of food security status. In the study done by Faridi and Wadood (2010), it was observed that household that are

accessible to electricity were found to be statistically significant at 5 per cent level of significance. Again, it was argued that households with electricity connection were 4 per cent more likely to be food secure than those which do not have any access to electricity. Based on these findings, there is a high probability for the household to be more food secure provided that it is capable of accessing electricity. This is true because the household members that are financially well are found to the house connected to electricity all the time which in turn is positively related to food security status.

2.3 Prevalence of diseases

Kamugisha (2002) argued that Pandemic diseases such as HIV/AIDS and other widespread diseases lead to decease of parents. Thus, some households are being occupied by children and old people. These people are prone to number of things such as inadequate of capital endowments, less mobile, purely needy and confrontation to diseases. Finally, such households are likely to food insecurity Diseases and infections are also identified as causes of food insecurity.

Also it was argued that diseases like as malaria, tuberculosis and mainly HIV/AIDS do not affect only manpower to be executed to agricultural activities to ensure household food availability, but also amplify the trouble of the household in getting sufficient and consistent food stuffs (Alex, 2003: cited in Gebrehiwot, 2009).

According to Kang'ara et al. (2001), it was reported that in order for the households to be strong economically it must possess the livestock. These livestock can act as a basis of pulling power, immediate cash income; it helps to food supplementary and sometimes act as a means of transportation. Furthermore, livestock are well thought-out as a means of safety and coping mechanisms during crop strike and other natural calamities. Livestock also provide other products which can be sold or consumed by the livestock proprietor to endow with nutrition, earnings, traction and energy. The livestock provide major products such as draught power, meat, milk, eggs and manure that are used as fertilizers. Also these animals provide feathers, fibre, hides and horns.

Apart from these products being provided by livestock, also the animals serve as an an important asset within the household which can be easily converted to cash to complement other wants. It is also argued that the household which own domestic animals are more food secure and farming activities are sustainable farming (Kassa et al.2002).

2.4 Farm size

Basically, food security status of the household is much affected by farm land size. This means that there is positive relationship between farm land size and food security status of households. The area under cultivation normally determines the amount of food production can be increased. Therefore, under survival agriculture, whereby plot sizes are available in local units of measurements, it is anticipated to influence significantly households' food security (Najafi, 2003). In this paper, the farm size was calculated in terms of hectares.

2.5 Oxen Ownership

Govereh and Jayne (1999) argued that oxen another determinant of food security status. In many developing countries, Oxen serve as a basis of traction and thereby considerably disturbing households' crop production. Animal traction power assists households to be able to cultivate bigger areas of land and hence agricultural operations are performed timely. Thus, a positive association exists between oxen ownership and household food security

3. Methods and Estimation

Data used in this paper, emanated from primary source in Mvomero District in Tanzania. Strictly a total sample size of 382 households was covered. Data were collected using a structured pre-tested questionnaire to answer the intended objective. Furthermore, multistage sampling was adopted with four stages. With the using simple random sampling, one division was selected to save time. Purposively, one ward out of seventeen wards and two villages out of five in the second and third stage respectively. In the fourth stage, a systematic sampling technique was adopted to select households which were to be studied. Finally, the probability proportional to size (pps) was used to select the households to be incorporated in the sample. Data entry, cleaning and analysis was done using SPSS version 15.0.

With regard to analytical tool, chi-square test (χ^2) independence test was used. This statistical tool has been articulated as goodness-of-fit test. It is a very powerful and applicable in statistics for testing the significance of the discrepancy between theory and experiment as was first stated by Prof. Karl Pearson in 1900.

In order to assess the correlation between the independent variables being physical capital and households` infrastructures, the cross tabulation was first performed taking into account the observed and expected frequencies. Moreover, Mascie- Taylor (2001) urged that the Chi- square test permits one to determine whether or not a significant difference exists between the observed number of cases falling into each category and the expected number of cases.

According to Abramowitz & Stegun (1965), the definition the chi-square distribution states that, if $Z_1,...,Z_k$ independent, standard random variables, then sum of their squares is given as:

$$Q = \sum_{i=1}^{k} Z_i^2 \qquad\qquad (1)$$

Equation (1) is distributed according to chi-squared distribution with k-degrees of freedom. This is denoted as:

$$Q \sim \chi^2(k) \quad \text{or} \quad Q \sim \chi_k^2. \qquad\qquad (2)$$

However, the probability density function (pdf)   for the chi-square distribution is given by:

$$f(\mathrm{x,k}) = \begin{cases} \dfrac{x^{(\frac{k}{2})-1} e^{(\frac{-x}{2})}}{2^{\frac{k}{2}} \Gamma(\frac{k}{2})}; & x \geq 0; \\ \\ 0 & otherwise \end{cases} \qquad\qquad (3)$$

Where Γ**(k/2)** denotes the Gamma function, which has closed-form values for integer k.

Also, the Chi – square (χ^2) independence test is defined as; $\quad \chi_{k-1}{}^2 = \sum_{i=1}^{k} \dfrac{(O_i - E_i)^2}{E_i} \qquad (4)$

Where, $O_i, i = 1,2,...k$ is the set of observed (experimental) frequencies value and $E_i, i = 1,2,..k$ is the corresponding set of expected (theoretical or hypothetical) frequencies. A degrees of freedom (n-1) and n is the number of categories.

In this paper, the Chi-square test has been used to find out if there is significant association between two categorical dependent and independent variable (table 1).

Table 1: Description of the Variables

variables	Descriptions
Dependent	Food security1=secured, 0=insecure
Independent variables	
Physical capital	Size of the land in terms of acres being possessed
	Number of oxen used by the household
	Number of livestock owned by the household
infrastructures	
	Electricity: 1= available, 0 = not available
	Fertilizers 1= applied fertilizers, 0 = not applied fertilizers
	Improved seeds 1= applied improved seeds, 0 = not applied improved seeds
	Pesticides 1= applied pesticides, 0 = not applied pesticides
	Hand hoe 1= applied hand hoe, 0 = not applied hand hoe
	Tractor1= applied tractor, 0 = not applied tractor
	Prevalence of diseases: 1 = suffered from chronic diseases, 0 = not suffered from chronic diseases

4. Discussion of the findings

As defined by the World Bank (1986) food security is access by all people at all the times to enough food for all for an active health life and the reverse is true for lack of food security. In this study, households were asked whether they were food secure or not for the last twelve months before this study to be done taking into consideration the above definition. The food security situation in the study area particularly Mvomero district where the study was carried out indicated that about 61.0 per cent (233) of the sampled households were food insecure whereas 39.0 per cent (149) of them were food secure (Mbukwa, 2012).

Table 2, indicates the extent to which household's infrastructure/facilities are associated with food security status in the study area. The predictor variables of interest were electricity, use of farm inputs (fertilizers, improved seeds, pesticides, hand hoe, tractors) and prevalence of diseases that occurred from time to time.

Table 2: Correlation between Food Security Status and Households Infrastructure or Facilities

Predictors	Number of households	% Total	Food security status		χ^2, (p-value)
			%Not food secure	%Food secure	
Electricity					
Available	86	22.5	17.5	5.0	13.343
Not available	296	77.5	43.5	34.0	**(0.000**)**
Fertilizer					
Applied	49	12.8	6.5	6.3	
Not applied	333	87.2	54.5	32.7	2.351, **(0.125*)**
Improved seeds					
Applied	89	23.3	14.7	8.6	
Not applied	293	76.7	46.3	30.4	0.181,**(0.67*)**
Pesticides					
Applied	83	21.7	16.0	5.7	
Not applied	299	78.3	45.1	33.2	6.963, **(0.008**)**
Hand hoe					
Applied	355	92.9	56.3	36.6	
Not applied	27	7.1	4.7	2.4	0.393, **(0.531*)**
Tractor					
Applied	271	70.9	46.9	24.0	(10.024,
Not applied	111	29.1	14.1	15.0	**(0.002**)**
Prevalence of diseases					
Suffered	273	71.5	42.4	29.1	
Not suffered	109	28.5	18.6	9.9	1.1, **(0.294*)**

Source: Survey, 2011

* means statistically insignificant at $\alpha = 5\%$ and ** means statistically significant at $\alpha = 5\%$

As regarding to access household to electricity, the findings indicated that about 22.5 per cent (86) of the sampled households had an access to electricity and 77.5 per cent (296) of them had no electricity. Among those with no access to electric power, 43.5 per cent were not food secure. The households which have no access to electricity experienced more food insufficient than those with access to electricity. In this paper, the findings indicated that the 5 per cent level of significance, there is a statistically significant association between the household heads that had access to electricity and food security status and $[(\chi^2 = 13.343, p-value = 0.000)$ and p<0.05]. The findings from this paper are comparable to those of the study by Faridi and Wadood (2010) which discovered that households having access to electricity was found to be statistically significantly associated with food security status.

Fertilizer use; it was observed that 333 (87.2 per cent) of the households do not use fertilizer during crop cultivation. Among these, 54.5 per cent were not food secure whereas 32.7 per cent of them were found to be food secure. A total of 44 (12.8 per cent) of the households were fertilizer users during crop cultivation. Among them, 6.5 per cent were not found to be food secure whereas 6.3 per cent were food secure. Statistically, at 5 per cent level of significance there is no relation between household food security status and use of fertilizer $[(\chi^2 = 2.351, p-value = 0.125)$ and p>0.05].

The use of improved seeds; it was found that the 89 of the sampled households (23.3 per cent) have access to improved seeds. Among them, 14.7 per cent were not food secure and 8.6 per cent were food secure. It was also observed that 293 households (76.7 per cent) had no access to improved seeds. Among them, 46.3 per cent were found to be not food secure while 30.4 per cent were observed to be food secure. Therefore, there is no statistical significance relationship between the use of improved seeds by the households and food security status $[(\chi^2 = 0.181, p-value = 0.67)$ and p>0.05].

Pesticides use, it was discovered that 21.7 per cent (83) of the respondents were found to use pesticides to kill crop pests whereas 78.3 per cent were found to be pesticides non- users. These Non- pesticides users consisted about 45.1 per cent of households which were found not to be food secure. Among the pesticides users, 16.0 per cent were found not to be food secure. Therefore pesticides use by the sampled households were found to be statistically significantly associated with household food security status at 5 per cent level of significance as $[(\chi^2 = 6.963, p-value = 0.008)$ and p<0.05].

The hand hoe use; it was observed that that about 92.9 per cent (355) of the households found to use hand hoes during crop cultivation. Among them, 56.3 per cent were found to be not food secure whereas 36.6 per cent were found food secure. Also the findings indicated that 7.1 per cent (27) were not hand hoes users. Among these, 4.7 per cent were found not to be food secure whereas 2.4 per cent were food secure. In the sampled households, it was observed that he use of hand hoes was found to be statistically insignificant related to households food security at the 5 per cent level of significance as [($\chi^2 = 0.393$, $p-value = 0.531$) and p>0.05].

The use of tractors; in this paper, it was observed that the households which used tractor to cultivate land were 271 (70.9 per cent) whereas 11 (29.1 per cent) did not use tractors during the time of land cultivation. Among them, about 46.9 per cent households which used tractors were not to be food secure and 24.0 per cent of them were found to be food secure. At the 5 per cent level of significance, the use of tractors in land cultivation by households was found to be statistically significantly related to household food security status [($\chi^2 = 10.024$, $p-value = 0.002$) and p<0.05]. This signifies that the findings from this paper are similar with those reported by Getachew (1995) whose findings revealed that the overall production depends much on extent to which farm inputs are used timely in agricultural activities. In this regard, at 5 per cent level of significance the use of pesticides and tractors were found to be statistically significant.

 Prevalence of diseases; the paper revealed that 71.5 per cent (273) surveyed households experienced diseases three months before conducting this study whereas 28.5 per cent (109) of them did not experience incidence of diseases at home. Among these affected households by diseases, 42.4 per cent were not found to be food secure whereas 29.1 per cent were food secure. For the households that were not faced by diseases, 18.6 per cent were not found to be food secure whereas 9.9 per cent were food secure. At the 5 per cent level of significance incidence of diseases at the households were found to be not statistically significantly related with household food security status [($\chi^2 = 1.1$, $p-value = 0.294$) and p>0.05]. The findings in this paper were found to be alike to that of the study by Kamugisha (2001) and (Alex 2003: cited in Gebrehiwot, 2009) whose report revealed that the household facing some diseases is more susceptible to food insecurity than the one liberated from diseases.

Furthermore, the physical capital of each of the surveyed households was assessed in terms of asset such as land owned in hectares, number of livestock owned by the households and the number of oxen used during land cultivation (Table 3).

Table 3: Correlation between Food Security Status and Physical Capital

| Predictors | Number of households | % Total | Food security status | | χ^2 ,(p-value) |
			% Not food secure	% Food secure	
Land size (in ha)					
< 0.4	113	29.6	16.2	13.4	
0.4 - 0 .8	110	28.3	17.3	11.5	3.529 , **(0.171*)**
1.2 ≥	159	41.6	27.5	14.1	
Livestock					
None	183	47.9	29.1	18.8	
1-10	131	34.3	20.2	14.1	
11 or more	68	17.8	11.8	6.0	1.047, **(0.593*)**
Oxen					
None	374	97.9	59.2	38.7	
1-10	8	2.1	1.8	0.3	2.413, **(0.12*)**

        Source: Field work

*means not statistically significant at $\alpha = 0.05$

In this paper, the findings indicated that 29.6 per cent (113) of the sampled households had <0.4 hectare. Among them, 16.2 per cent were not food secure whereas 13.4 per cent were food secure. A total of 110 (28.3 per cent) surveyed households had 0.4-0.8 hectare, and 41.6 per cent (159) of them had ≥ 1.2 hectares. For the households that owned 0.4 to 0.8 hectares, 17.3 per cent and 11.5 per cent of them were not food secure and food secure correspondingly. Among those households that had more or equal to 1.2 hectares, 27.5 per cent were found not to be food secure whereas 14.1 per cent were food secure. Therefore, at 5 per cent level of significance there is n statistical association between the land size possessed by the household heads and households food security [($\chi^2 = 3.529$, $p-value = 0.171$) and p>0.05]. The findings from this paper is contrary to the study done by Najafi (2003) whose findings showed that production can be increased expansively through expanding the areas

under cultivation thereby leading to food security.

Livestock possession; the livestock such as cattle, goat, donkey, sheep, pigs and chicken are mainly reared by the households in the study area. It was revealed that about 47.9 per cent (183) of the surveyed households did not possess livestock, 34.3 per cent (131) of them possess 1 to 10 livestock and 17.8 per cent (68) of the had more or equal to eleven livestock. On the other hand, the findings showed that the food insecurity decreases with an increase in the number of livestock possessed by the sample households. Also, this paper showed that more food deficit was prominent in the households having no livestock compared to those possesses livestock. About 29.1 per cent of surveyed households had no livestock were not food secure. Also, 20.2 per cent of the survey households with 1-10 livestock were found. Similarly, about 11.8 per cent of the sampled households not food secure had more or equal to eleven livestock. Statistically, this paper revealed that there no significance relationship between household food security status and the number of the livestock possessed by the sampled households at the 5 per cent level of significance [$(\chi^2 = 1.047, p-value = 0.593)$ and p>0.05]. The findings from this paper are dissimilar from the affirmative results of the study done by Kassa et al. (2002) and Kanga`ra et al. (2001) that revealed that households that possess livestock have a more chance to increase food security status and nutrition.

Oxen possession; 97.9 per cent (374) of the surveyed households did not possess oxen for ploughing their land. Among these, 59.2 per cent were found to be not food secure. Nevertheless, 2.1 per cent (8) of these surveyed households possess 1 to 10 oxen. Among them, 1.8 per cent were found not food secure whereas 0.3 per cent were food secure. Also it was revealed in this paper that the oxen use do not support the findings of Govereh and Jayne (2009), who publicized that there is a affirmative relationship between oxen use and household food security status. With reference to this paper, among the households which possessed oxen indicated that there was high proportion of households which were not food secure than those had no oxen. Thus, at 5 per cent level of significance, there was no statistical significant correlation between food security status and oxen possession among surveyed households in the study area as indicated as [($\chi^2 = 2.413, p-value = 0.12$) and p>005].

5. Conclusion and recommendations

Based on the data analyzed empirically, it is remarkable by evidence that variables such as pestices, tractors and electricity were found to be statistically significant associated with household's food security in the study area. This suggests that these variables are of great importance for the household food security in the study area. In view of these findings, there is a need to pay attention supporting rural farmers' to be able to access them. Again there is need to carry out an in-depth study using multivariate statistical models for clustering households food insecurity and creating principal components and collecting several variables which measure food security, reducing them by creating indices will enable to know which region is more prone to this problem by how much percentage of variance. Also, farmers are to be assisted access farm inputs at affordable prices. Again the findings indicated that in the study area there a problem of food insecurity. Generally, it is evidenced that Tanzania has not achieved to eradicate the extreme poverty and hunger as first target for the Millennium Development Goals (MDGs).

Moreover, the seriousness of food insecurity in Africa, has led some countries to declare national emergencies and speed up main concern action plans and Tanzania being among of them. Other countries including Burkina Faso, Chad, the Central African Republic, Gambia, Niger, Mali, Togo. These actions have started mobilizing global support, partnerships and resources and strengthening the coordination of development management. Also, it has been known that new multilateral instruments are supporting Global Agriculture and Food Security Program, which is one basis of financial support for country investment plans. By July 2012, 11 countries had received $430 million from the programme (including Burundi, Ethiopia, Malawi, The Gambia, Niger, Rwanda, Senegal, Sierra Leone, Liberia, Tanzania and Togo) to implement CAADP-aligned agriculture and food security programmes (MDGs, 2013)

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