

Rapid Assessment of Covid-19 on Agriculture, Food and Nutrition Security

1.0 Introduction

The coronavirus also known as the COVID-19, declared a global pandemic by the World Health Organization (WHO), has impacted the world at an unprecedented level spreading rapidly at an uncontrollable pace. The socioeconomic impact of a pandemic like the coronavirus will have major implications for all countries, but especially a small, least developed country like The Gambia with an equally small economy, reliant mainly on tourism, agriculture and remittance inflows. The Gambia's small, undiversified economy was already susceptible to external shocks as seen with the Ebola crisis of 2014, which had a significant negative effect on the tourism sector, despite The Gambia not registering any cases in the country.

The spread of the coronavirus which can only be contained through social distancing and maintaining good hygiene has already heavily impacted on the health, tourism and trade sectors as the country's border and airspace has been closed and public gatherings have been banned. Schools and many institutions have been closed in an effort to curb the spread of the virus.

It is therefore important to understand the impact of the coronavirus across the country and across the sectors in order to determine the necessary policy measures needed to ensure recovery. However, no one can reliably predict the full economic impact of the outbreak and speculations are changing rapidly. Too much depends on what is unknowable—how long the outbreak lasts, how many countries it afflicts, and the extent to which a coordinated, concerted, fast-track policy response is mobilized and sustained. But what we do know is that the outbreak arrived at a weak point for the world economy, just when global growth was beginning to pick up from its lowest rate since the 2009 financial crisis.

An economic slump would also set back the fight against extreme poverty. It is imperative, therefore, that policymakers everywhere recognize how economic harm can be transmitted from one country to another—and to act quickly to prevent its spread. The transmission of economic harm is likely to occur through several channels. For West Africa countries, crashing demand from China and the rest of the world will dry down major economic sectors, notably agriculture and tourism. Countries that are highly dependent on food imports will feel the effects of global price swings most dramatically.

The global pandemic of Coronavirus (Covid-19) might further exacerbate the decline of agriculture production, value addition, food insecurity, in The Gambia; one of the smallest countries in Sub-Saharan Africa (11,295 square kilometres) with 1.7 million¹ inhabitants, if the crisis extends into 2020/21 cropping season, May - September.

Agriculture sector contributes 25 percent of GDP and 30–40 percent of all foreign exchange earnings from exports, though share of services in GDP is increasing. Agriculture and related industries, contribute to economic growth, employment, poverty reduction, food security, and nutrition. The sector employs nearly half (46 percent) of the labour force and is the source of livelihood for 80 percent of the rural population². For about 72 percent of poor households and 91 percent of extremely poor rural households, agriculture is the main source of income.

However, agricultural production in The Gambia is subsistence rain-fed crop production and livestock rearing which provides half of the country's consumption needs. In the period 2008-2017 agriculture sector grew at an average of 2.4% per year, making the Gambia the third least growing country in terms of agriculture in the region, after Cape Verde and Guinea Bissau. This performance can partly be attributed mainly to effect of climate change and other factors including, weak research and extension systems, leading to inappropriate/unsustainable³ farming practices and pest control; low yields⁴.

Cereal crop yields, the staple food of Gambian population, have been declining steadily for the past 10 years, compared to rest of West Africa, increasing food import bills and persistent threat of food insecurity. For instance, the country imports 83 percent of its requirement for rice. Therefore, COVID-19 will further increase food insecurity in the country, as stricter measures are implemented across the world to curtail the spread of the virus. As of April 3, 2020, there are 972 303 confirmed cases and 50 322 deaths globally with 5263 confirmed cases and 164 deaths in Africa, including The Gambia, where 4 imported confirmed cases, and one death have been registered.

Beyond its impact on human health (materialized by morbidity and mortality), COVID-19 is disrupting an interconnected world economy through global value chains, which account for nearly half of global trade, abrupt falls in commodity prices, fiscal revenues, foreign exchange receipts, foreign financial flows, travel restrictions, declining of tourism and hotels, frozen labor market, etc. In the Gambia it has shorten 2020 tourism season, affected commodity food prices, etc., as the country's border and airspace have been closed and weekly markets banned in an effort to curb the spread of the virus.

¹ GBoS 2013 Population and Housing Census

² 2015/16 Integrated Household Survey (IHS)

³ Deforestation, poor soil conservation, use of chemical fertilizers etc...

⁴ Current cereal yields are low and below 1 Mt/ha which are lower than the yield figures for rice and maize for West Africa.

Intrinsically linked, CILSS/AGRHYMET Regional Centre has forecasted 2020 rainfalls to be either greater or equivalent to the seasonal averages of the 1981-2010 reference period; heterogeneous start of the season; generally late end of the season; relatively long dry spells and; average flows in most coastal rivers basins and COVID- 19 can exacerbate this situation. There is imminent risk of a desert locust outbreak threatens the region. The consequences of a possible locust outbreak, added to those of the armyworm, which now infests the entire West African region, including all regions of the country, could have a long lasting effect on the region's agriculture and food systems.

With an anticipated erratic rainy season and an imminent impact of Covid-19 and in line with emergency preparedness and prevention, the Ministry of Agriculture constituted a taskforce. The main task of the taskforce is to assess the effect of Covid-19 crisis on agriculture, food and nutrition security. Furthermore, develop a response plan, to alleviate the consequences on vulnerable households, who are grappling with food insecurity due to poor crop yields in 2019, prevalence of Peste des Petites Ruminants (PPR) and Newcastle disease and outbreak of Equine Influenza and the outbreak of the COVID-19.

1.1 Objectives of the Assessment

The **overall objective** of the rapid assessment is to estimate the proportion of the population facing difficulties in accessing food, and thus habitual food consumption is insufficient to provide the dietary energy levels that are required to maintain a normal active and healthy life. Specifically the assessment will ascertain number of food insecure people who will be in emergency (phase 4), in crisis (phase 3), and vulnerable people who are under stress (phase 2), as well as the most food insecure districts/regions or in famine (Phase 5).

1.2 Rapid Assessment Methodology

For this assessment, the taskforce relied on extensive review of relevant literatures (specifically national documents), current stakeholder strategies, national Strategy documents and literature of major development sectors to produce a draft on Covid-19 on agriculture, food and nutrition security, trends in the country. The survey team reviewed pre-harvest of October 2019 and Cadre Harmonise of March 2020, seed policy and national statistical documents in order to understand the magnitude of the crisis and would-be impact on food and nutrition security in the country.

1.3 Limitation

One major limitation of this rapid assessment is availability of updated and reliable data on some parameters. Therefore, the outputs of the rapid assessment are better put into proper perspective for contextual analysis of the agriculture value chain, food and nutrition insecurity, if discussed against reliable data from the field at regional level.

2.0 Situation Analysis/Overview

As per situation report of April 3, 2020, there are 4 confirmed cases of Covid-19 in the Gambia, with one death, two recovered, one pending case and 247 quarantine. Three of the four cases confirmed were found in KMC and one registered for URR, specifically Numuyel. Therefore, the virus has not yet spread into agricultural production regions of the country, but Government's declaration of state of health emergency and adoption of measures to contain the spread of the virus that include: travel restrictions, a ban on public events and agricultural markets (weekly lumos), the closure of schools and non-essential businesses, and limits on opening hours of market, thus have affected urban livelihoods and left farmers unable to sell their produce, especially vegetables, and buy seeds or other inputs as they prepare for 2020 cropping season. The effects of disruption of trade, price volatility, truncation of the tourist season, diminished remittances, closure of schools are elaborated below.

2.1 Remittances

Migrant remittances are an important source of external finance in West Africa. In The Gambia remittance flows contribute, substantially to economy growth (15.3% of GDP⁵) and capacity of households to meet food needs and other essential. Remittances are an important income source for many households in both rural and urban areas of The Gambia with 64.1%⁶ of the population relying on remittances (66% urban and 60% rural). Areas where remittances to African countries are sent from are COVID-19 hardest hit regions/countries such as Western Europe (41 percent⁷) and United States (5 percent). Therefore, any decrease or elimination of remittances flows will substantially affect overall food security in both urban and rural areas.

2.2 Tourism

Tourism is a strategic economic sector in West and Central Africa. Trading, Economics forecasts a significant drop of tourist arrivals and this means, significant employment losses in many countries that rely heavily on tourism, notably Cape Verde (43.4 percent), The Gambia (19.9 percent), and Senegal (11.4 percent). It is predicted that over 20,000 jobs will be lost in the tourism sector as a result of the COVID-19 pandemic.

⁵ WFP, 30 March 2020. Economic and Market Impact Analysis of COVID-19 on West and Central Africa

⁶ The Gambia Integrated Household Survey 2015/16: Socio-Economic Characteristics, GBoS

⁷ WFP, 25 March 2020. Economic and food security implications of the COVID-19 outbreak.

2.3 Supply chain & prices

Border closure and constraints on supply, it is important to note that food commodities prices have been volatile throughout 2019 and countries that did not have strong harvests from last agricultural season, such as Senegal and Gambia, are experiencing early rise in prices of dry cereals as stocks decline⁸. Trade disruption could be the major driver of food price increase and volatility in The Gambia. As prices are likely to increase given the onset of the lean season, additional increases due to Covid-19 and supply restrictions or disruptions could further aggravate food insecurity, particularly for import dependent countries like The Gambia.

2.4 School closure

The closure of schools has short-term repercussions on families in terms of capacity to continue working as well as care, protection and health of children, in addition to the potential longer-term implications for students, depending on how long schools remain closed. It is estimated that a total of 239,000 girls and boys are fed through the national homegrown SFP. The closure of schools has burdened households in providing an additional meal for the affected students who would have otherwise received daily hot meals through the national school feeding programme (SFP). Highly food insecure households are likely not able to replace the nutritious meals kids get served at school which will impact on their nutritional status, resulting in increased acute malnutrition. In addition, vulnerability to morbidity and mortality increases with malnourishment and an estimated loss of GDP of 5.9%⁹

2.5 Urban Vulnerability

As the virus transmits most easily in high density population, cities are likely to face the brunt of outbreaks around the world. West and Central Africa are undergoing rapid urbanization, introducing another major vulnerability to the mix¹⁰. It is increasingly important to monitor the food security and nutrition status of urban populations in particular as this crisis unfolds. Moreover, increasingly strict mitigation measures attempting to reduce movement and interaction will have direct and substantial negative implication for livelihoods based in the informal sector. Already employees are been laid off as a result of temporary closure of business.

2.6 Food Security Situation (January – August 2020)

Consequently, the situational analysis/overview on agriculture, food and nutrition security is based on pre-harvest and Cadre Harmonize reports of 2019 and 2020 with further analysis on urban vulnerability. The latter is an analytical tool used for identifying risk areas and populations in food and nutrition insecurity, conducted twice each year and the latest cycle was in March 2020.

2th administrative level	Total population	Area Classification	CURRENT SITUATION										
			Percentage of households affected for each phase					Total population in Phase 1	Total population in Phase 2	Total population in Phase 3	Total population in Phase 4	Total population in Phase 5	
			Ph 1	Ph 2	Ph 3	Ph 4	Ph 5						
BCC	26 413	1	90%	9%	1%	0%	0%	23 771	2 377	264	-	-	264
CRRN	138 258	2	61%	29%	10%	0%	0%	84 338	40 095	13 826	-	-	13 826
CRRS	155 579	1	84%	13%	3%	0%	0%	130 687	20 225	4 667	-	-	4 667
KMC	467 948	1	86%	11%	3%	0%	0%	402 436	51 474	14 038	-	-	14 038
LRR	105 254	2	72%	20%	8%	0%	0%	75 783	21 051	8 420	-	-	8 420
NBR	209 919	2	74%	20%	6%	0%	0%	155 340	41 984	12 595	-	-	12 595
URR	209 136	2	72%	20%	8%	0%	0%	150 578	41 827	16 731	-	-	16 731
WCR	1 143 334	1	83%	16%	1%	0%	0%	948 968	182 934	11 433	-	-	11 433
Total	2 455 843							1 971 900	401 967	81 976	-	-	81 976

According to the most recent CH analysis which was concluded before the COVID-19 outbreak, the global figure of the situation from **Jan – March 2020** in all the eight regions analyzed for The Gambia classified **81 976** persons as in crisis (phase 3 to 5 i.e). These people require immediate action to protect livelihoods and reduce food consumption gaps, save lives and livelihoods, while about **401 967** persons in stress situation (phase 2). Considering all the effects of the restrictions, the taskforce assumed that the projected **situation (June – August 2020)** already prevails and thus **136, 586** people have fallen into crisis to emergency, and about **555, 988** persons are under stress (phase 2). Livestock

sub-sector, the pastoral situation registered significant fodder shortages due to last year's long dry spells.

However, effects of COVID- 19 were not factored in the CH analysis, while the fluid and uncertainties of the spread of the virus makes it difficult to gauge/predict the full impact of the COVID-19 pandemic. Nevertheless, measures taken to prevent and contain the spread of the disease have influenced both urban and rural livelihoods and have exacerbated the already fragile food insecurity situation. The restrictions on the movement of people including urban dwellers and herdsman especially on the cross-border transhumance and access to pastures posed serious food security threats. This has negative implications on importations of food commodities, animal products, which can propel the forces of demand and supply on the small available agricultural commodities, especially where stocks are built up.

Furthermore, disruption in demand and supply chain has affected both urban and rural livelihoods; worsen by diminished remittances because of senders of remittances residing in the most hard-hit regions or countries across the globe. Shortened tourist season in the country, disruption in other sectors due to temporary shutdown of businesses has led to lay-offs of the already economically vulnerable individuals who live on hand-to-mouth. These multiple factors, including inflation and local currency depreciation severely affect households' access to food and nutrition in the country.

⁸ WFP,30 March 2020. Economic and Market Impact Analysis of COVID-19 on West and Central Africa

⁹ The Gambia Cost Of Hunger in Africa Report (COHA) 2019

¹⁰ WFP,30 March 2020. Economic and Market Impact Analysis of COVID-19 on West and Central Africa

With the COVID-19 situation, underpinning vulnerability beyond the measured negative impact of the agricultural sector in the CH, further analysis is done to account for the increased urban vulnerability resulting from job/livelihood losses in the various sectors. Job losses in the urban areas are estimated to affect about 40,000 people as a result of the COVID-19 situation, thus increasing the pockets of urban vulnerability and the CH crisis estimates estimates by an additional 40,000.

Consequently, there is need to support and protect the population in crisis (176,586 people, approximately 22,073 households) and build resilience of those under pressure (555,988 people, approximately 69,499 households). The support would be in the form of food (in-kind/cash) assistance and agricultural inputs (seeds, fertilizers, veterinary drugs and farm implements)

Table 2: CH Current and Projected food security

Key Figures	March-May 2020		June-Aug 2020	
Population in high vulnerability/severe food insecurity situation (phase 3-5 CH)	About 82,000		About 137,000**	
Population in most affected areas requiring immediate action to save lives and livelihoods	URR	16,000	URR	34,300
	KMC	14,000	KMC	23,000
	CRRN	13,900	CRRN	21,000
	NBR	12,600	NBR	20,700
	WCR	11,400	WCR	18,700
	BCC	200	BCC	500
	LRR	8,400	LRR	10,500
	CRRS	4,700	CRRS	7,800
Population marginally food insecure (phase 2 CH)	402,000		556,000	
Population in affected areas requiring resilience building to save lives and livelihoods	URR	52,284		
	KMC	65,513		
	CRRN	48,390		
	NBR	104,960		
	WCR	228,667		
	BCC	3,962		
	LRR	24,208		
	CRRS	28,004		

Source: CH March 2020

** With an additional 40,000 urban vulnerable population

2.7 Situation of Market Price

Prices of key staples were largely stable when compared to last month, however, when compared to the same time last year (February), prices are generally much higher for most of the staples. For Maize and Millet, the main cereals the price in February was 98% and 126% higher than the same time last year. For local paddy rice is 12% higher, while no significant change for onions and Irish potato, sweet potatoes is 22% higher. Furthermore, while the price of vegetable oil is 20% lower, the price for palm oil is 76% higher. The price of sugar another essential commodity was 9% higher than the same time last year. Although there is not much significant change in food commodity prices in the local market since the index COVID-19 case was confirmed, such as rice, oil, onion, flour. However, with prolonged global crisis it can impact the economy, because Gambia is a net importer for these products. For instance, if the COVID-19 outbreak lasts until end of 2020 or beyond, then the question would be how the prices of these products will evolve, despite assurance from national food stock levels, see annex 2 below.

2.8 Scenarios

Scenario 1: In this first scenario, the pandemic lasts another 6 months (March to August) in The Gambia. This will have an impact on agricultural production and productivity, further exacerbate food and nutritional insecurity, unemployment, poverty and household and national income.

Scenario 2: In this scenario, we consider 9 Months (March-December) will have an impact on shift in priorities, depletion of the food and seed stocks, productive assets, reduction in labour force.

3.1 Response Actions Proposed

Based on the above assessment the following immediate response for populations in crisis and emergencies:

3.1.1 Food Assistance

Food needs in metric tons is presented below, while the assistance can be delivered in kind or in cash to the estimated 22,073 highly vulnerable households and the estimated 69,499 marginally food insecure households.

Crisis (Phase 3)/ Highly vulnerable population food requirements (April - May)		Under- pressure (Phase2&3)/ Highly vulnerable and Marginally food insecure food requirements (June- August)
Basic food commodity	22,073 Households for 2 months (MT)	91,572 Households for 3 months (MT)
Rice	2207.3	13,735.725
Beans	635.7024	3955.8888
Vegetable oil	317.8512	1977.9444
Salt	52.9752	329.6574

3.1.2 Seed and Fertilizers Requirement

Based on information above and figures of 2013 Census, 73 percent of the households (160,871) are farming households and involved in crop and livestock production. Therefore, different scenarios were explored to determine seeds and fertilizers required of these

Crops	Seeds Requirement	
	1 Ha/HH (in MT)	0.5 Ha/HH (in MT)
Groundnut	5,903	2,952
Rice	1,180.60	590.30
Maize	708.36	265.635
Cowpea	1,239.63	82.64
Findi	70.836	4.95852

farmers. For instance, proportion of farming households involved in crop production, conservatively estimated at 40, 20, 20, 15 and 5 percent for groundnut, rice, maize, cowpea and findi respectively. Furthermore, each household either supported with required quantity of seeds to cultivate one or half a hectare of land. Likewise, it was argued that the proportion of households involved in maize, cowpea and findi production might be overestimated, because of limited farmlands and availability of labour for crop production and thus, reduced to 15, 2 and 0.7 percent. Consequently, the results of seeds and fertilizers requirement are shown on

table 2; details of estimated are shown on annex 3 & 4 below. Fertilizers rate per hectare is based on recommended application dosage of 2 bags (100 kg) of NPK 6-20-10 for groundnuts and cowpea, 4 bags (200 kg) of NPK 15-15-15 and 2 bags (100 kg) of urea for rice and maize, while for findi only 2 bags of NPK 15-15.15 are shown on annex 5 & 6.

Table 2. Fertiliser needs.

Fertilizers	1 Ha/HH (in MT)	0.5 Ha/HH (in MT)
NPK 6-20-10	6,493.30	2,479.26
NPK 15-15-15	10,035.10	4,173.42
Urea	4722.4	2066.05

3.1.4 Livestock Production inputs

Livestock sub-sector will not be spared by Covid-19 pandemic. Currently, the poultry industry is solely dependent on importation of production inputs (fertile eggs, Day Old Chicks, feed, vaccines and drugs) and thus access to these productive resources might also be disrupted if there is any further border closure, as there are no local suppliers of these basic inputs and raw materials.

Therefore, to ensure continuous supply of DOCs, there might be a need to strengthen private sector dominated hatcheries with fertile eggs (broiler and layers) and vaccines against Marek's disease and Newcastle Disease, improve capacity in poultry feed production through procurement of maize and concentrates increase ruminant (70 percent currently being imported) and swine production capacities of the country.

Table 3. Livestock production inputs

Livestock Production	
Poultry hatchery i. 300,000 Cobb500 broiler fertile eggs ii. 120,000 Cobb500 layer fertile eggs	Vaccines for livestock health i. 120,000 doses of Marek's disease vaccines ii. 4,255,000 doses of NCD vaccines iii. 105,000 doses of Fowl Pox vaccines iv. 210,000 doses of anti-coccidiosis v. 6,000 doses Infectious Laryngotrachitis(ILT) Vaccines vi. 6,000 doses of Infectious Bronchitis (IB) Vaccines vii. 6,000 doses of Egg Drop Syndromes (ED) vaccines viii. 5,000 doses of Salmonella Vaccine ix. 300,000 doses of CBPP vaccine x. 30,000 doses of FMD vaccines xi. 800,000 of PPR vaccine
Poultry breeding stock i. 5,000 breeding stock (4000 Cobb500 broiler and 1000 Bovan Brown layers)	
Poultry feeds i. 5,094 Mt of yellow maize for feed mills ii. 4,246 Mt of concentrates for feed mills iii. 5832 Mt finish fed for breeding stock(parent) iv. 5,542 Mt finish feed for commercial poultry v. 2,500 Mineral blocks of 5 kg for cattle vi. 200Mt of groundnut cake for	Drugs and Sanitary production i. 5,140 Sachets of 100g Anti-stress ii. 1,894 Sachets of 100g of De-wormers iii. 2,282 bottles of 1litre of disinfectants iv. 50,000 albendazole boli of 2500mg for cattle v. 30,000 albendazole boli of 300mg for sheep and goats vi. 30,000 boli of 300mg of albendazole dewormers vii. 100 bottles of Ivermectin (1%)

4.0 Recommendations

Measures in place are required to curb the spread of COVID-19 and it might lead to disruptions of the supply chain, household income lost, and deterioration of the livelihood of the vulnerable population, thus the following recommendations are suggested:

- Nationally there will be a need to prioritize and accelerate the implementation response plan for the population in crisis and emergency. Also, children under five years of age should be prevented from acute malnutrition;
- Develop proactive monitoring and assistance measures to avert the food security crisis of the vulnerable population;
- Decline in food production and difficulties in accessing key production resources such as inputs, credits and extension advice will arise, thus need for further strengthening of extension service delivery and other services;
- There will be sudden increase in imported food products due to increased dependence on foreign foods and loss of households income; and
- The consequences of COVID-19 should be put into consideration and set up contingency plans for desert locusts threat
- The Ministry of Agriculture to take a lead in coordinating the National Food Security Response in close collaboration with other agencies
- Strengthened social protection mechanism by providing essential food in the short term and support livelihoods
- Support food supply chains in order to stabilize food systems

Annexes

ANNEX 1: PROFILE OF FOOD INSECURE/VULNERABLE POPULATION

Crisis affected population and marginally food insecure population 22
Farmers
Herdsmen
Petty traders
School-going children
Quarantined breadwinners and their families
Tourism sector workers
Low skilled workers and vulnerable family assistants

Annex 2:

MINISTRY OF TRADE, INDUSTRY, REGIONAL INTEGRATION AND EMPLOYMENT TOTAL INSTOCK AND EXPECTED STOCK OF ESSENTIAL COMMODITIES

COMMODITIES	IN STOCK				EXPECTED STOCK	EXPECTED DATE OF ARRIVAL
	9-Mar-20	16-Mar-20	23-Mar-20	30-Mar-20	30-Mar-20	
RICE (MTS)	11,397	18,214	13,012	10,253	39,565	3rd April 2020
SUGAR (MTS)	9,970	8,143	34,291	27,153	29,243	10th April 2020
FLOUR (MTS)	660	465	464	1,792		
TOMATO PASTE (6tins/CTNS)	0	6,800	0	0		
MILK (SINGLE/48tins/CTNS)	8,745	20,730	11,300	15,200	15,638	15th April 2020
EDIBLE OIL (LTRS)	216,264	4,087,280	1,331,130	1,212,800	70,000	Under discharge at port of Banjul
ONION (BAG)	0	0	8,650	55,840	0	
POTATO (BAG)	7,200	26,250	9,000	0	0	
WHOLE CHICKEN (CTNS)	1,873	1,438	585	5,713	6,750	2nd April 2020
CHICKEN LEGS(CTNS)	80,479	74,074	73,605	75,280	8,000	2nd April 2020
CEMENT (MTS)	34,790	33,420	25,642	17,912	0	

Note: The Current stock of rice will last for 1 and half Month, whilst the expected stock will last for 3 Months

ANNEX 3: SEED REQUIREMENT FOR 1 HA/HH OF MAJOR FOOD CROPS

REGIONS	TOTAL HH	AGRIC. HH	No. of Groundnut Farmers (40%)	Seed rate (kg/ha)	Groundnut Seeds Required (MT)	No. of Rice Farmers (20%)	Seed rate (kg/ha)	Rice Seeds Required (MT)	No. of Maize Farmers (20%)	Seed rate (kg/ha)	Maize Seeds Required (MT)	No. of Cowpea Farmers (15%)	Seed rate (kg/ha)	Cowpea Seeds Required (MT)	No. of Findi Farmers (5%)	Seed rate (kg/ha)	Findi Seeds Required (MT)
WCR	83607	43838	17535.2	125	2191.9	8767.6	50	438.38	8767.6	30	263.028	6575.7	70	460.299	2191.9	12	26.3028
LRR	17323	16637	6654.8	125	831.85	3327.4	50	166.37	3327.4	30	99.822	2495.55	70	174.6885	831.85	12	9.9822
NBR	17611	16857	6742.8	125	842.85	3371.4	50	168.57	3371.4	30	101.142	2528.55	70	176.9985	842.85	12	10.1142
CRR N	13925	13738	5495.2	125	686.9	2747.6	50	137.38	2747.6	30	82.428	2060.7	70	144.249	686.9	12	8.2428
CRR S	16402	15170	6068	125	758.5	3034	50	151.7	3034	30	91.02	2275.5	70	159.285	758.5	12	9.102
URR	12003	11820	4728	125	591	2364	50	118.2	2364	30	70.92	1773	70	124.11	591	12	7.092
TOTAL	160871	118060	47224		5,903	23612		1,180.60	23612		708.36	17709		1,239.63	5903		70.836

ANNEX 4: SEED REQUIREMENT FOR 0.5 HA/HH OF MAJOR FOOD CROPS

REGIONS	TOTAL HH	AGRIC. HH	No. of Groundnut Farmers (40%)	Seed rate (kg/0.5 ha)	Groundnut Seeds Required (MT)	No. of Rice Farmers (20%)	Seed rate (kg/0.5 ha)	Rice Seeds Required (MT)	No. of Maize Farmers (15%)	Seed rate (kg/0.5 ha)	Maize Seeds Required (MT)	No. of Cowpea Farmers (2%)	Seed rate (kg/0.5 ha)	Cowpea Seeds Required (MT)	No. of Findi Farmers (0.7%)	Seed rate (kg/0.5 ha)	Findi Seeds Required (MT)
WCR	83607	43838	17535.2	62.5	1095.95	8767.6	25	219.19	6575.7	15	98.6355	876.76	35	30.6866	306.866	6	1.841196
LRR	17323	16637	6654.8	62.5	415.925	3327.4	25	83.185	2495.55	15	37.43325	332.74	35	11.6459	116.459	6	0.698754
NBR	17611	16857	6742.8	62.5	421.425	3371.4	25	84.285	2528.55	15	37.92825	337.14	35	11.7999	117.999	6	0.707994
CRR N	13925	13738	5495.2	62.5	343.45	2747.6	25	68.69	2060.7	15	30.9105	274.76	35	9.6166	96.166	6	0.576996
CRR S	16402	15170	6068	62.5	379.25	3034	25	75.85	2275.5	15	34.1325	303.4	35	10.619	106.19	6	0.63714
URR	12003	11820	4728	62.5	295.5	2364	25	59.1	1773	15	26.595	236.4	35	8.274	82.74	6	0.49644
TOTAL	160871	118060	47224		2,952	23612		590.30	23612		265.635	17709		82.64	826.42		4.95852

ANNEX 5: FERTILIZER REQUIREMENT FOR 1 HA/HH OF MAJOR FOOD CROPS

Fertilizer	TOTAL HH	AGRIC. HH	No. of Groundnut Farmers (40%)	NPK 6.20.10 rate (2 bags/100kg/ha)	NPK Required (Bags)	No. of Rice Farmers (20%)	NPK 15.15.15 rate (bag/ha)	Urea rate (bag/ha)	NPK Required (bags)	Urea Required (bags)	No. of Maize Farmers (20%)	NPK 15.15.15 rate (bag/ha)	Urea rate (bag/ha)	NPK Required (bags)	Urea Required (bags)	No. of Cowpea Farmers (15%)	NPK 6.20.10 rate (2 bags/100kg/ha)	NPK Required (Bags)	No. of Findi Farmers (5%)	NPK 15.15.15 rate (bag/ha)	NPK Required (bags)
WCR	83607	43838	17535.2	2	35070	8767.6	4	2	35070.4	17535.2	8767.6	4	2	35070.4	17535.2	6575.7	2	13151.4	2191.9	2	4383.8
LRR	17323	16637	6654.8	2	13310	3327.4	4	2	13309.6	6654.8	3327.4	4	2	13309.6	6654.8	2495.5	2	4991.1	831.85	2	1663.7
NBR	17611	16857	6742.8	2	13486	3371.4	4	2	13485.6	6742.8	3371.4	4	2	13485.6	6742.8	2528.5	2	5057.1	842.85	2	1685.7
CRR N	13925	13738	5495.2	2	10990	2747.6	4	2	10990.4	5495.2	2747.6	4	2	10990.4	5495.2	2060.7	2	4121.4	686.9	2	1373.8
CRR S	16402	15170	6068	2	12136	3034	4	2	12136	6068	3034	4	2	12136	6068	2275.5	2	4551	758.5	2	1517
URR	12003	11820	4728	2	9456	2364	4	2	9456	4728	2364	4	2	9456	4728	1773	2	3546	591	2	1182
TOTAL	160871	118060	47224		94,448	23612			94,448.00	47224	23612			94448	47224	17709		35418	5903		11806
Metric Tons					4,722.40				4,722.40	2361.2				4,722.40	2361.2			1770.9			590.3

ANNEX 6: FERTILIZER REQUIREMENT FOR 0.5 HA/HH OF MAJOR FOOD CROPS

Fertilizer	TOTAL HH	AGRIC. HH	No. of Groundnut Farmers (40%)	NPK 6.20.10 rate (2 bags/0.5ha)	NPK Required (Bags)	No. of Rice Farmers (20%)	NPK 15.15.15 rate (bag/0.5 ha)	Urea rate (bag/ha)	NPK Required (bags)	Urea Required (bags)	No. of Maize Farmers (15%)	NPK 15.15.15 rate (bag/ha)	Urea rate (bag/ha)	NPK Required (bags)	Urea Required (bag/ha)	No. of Cowpea Farmers (2%)	NPK 6.20.10 rate (2 bags/100kg/ha)	NPK Required (Bags)	No. of Findi Farmers (0.7%)	NPK 15.15.15 rate (bag/ha)	NPK Required (bags)
WCR	83607	43838	17535.2	1	17535	8767.6	2	1	17535.2	8767.6	6575.7	2	1	13151.4	6575.7	876.76	1	876.76	306.86	1	306.86
LRR	17323	16637	6654.8	1	6655	3327.4	2	1	6654.8	3327.4	2495.5	2	1	4991.1	2495.55	332.74	1	332.74	116.45	1	116.45
NBR	17611	16857	6742.8	1	6743	3371.4	2	1	6742.8	3371.4	2528.5	2	1	5057.1	2528.55	337.14	1	337.14	117.99	1	117.99
CRR N	13925	13738	5495.2	1	5495	2747.6	2	1	5495.2	2747.6	2060.7	2	1	4121.4	2060.7	274.76	1	274.76	96.166	1	96.166
CRR S	16402	15170	6068	1	6068	3034	2	1	6068	3034	2275.5	2	1	4551	2275.5	303.4	1	303.4	106.19	1	106.19
URR	12003	11820	4728	1	4728	2364	2	1	4728	2364	1773	2	1	3546	1773	236.4	1	236.4	82.74	1	82.74
TOTAL	160871	118060	47224		47,224	23612			47,224.00	23612	17709			35418	17709	2361.2		2361.2	826.42		826.42
Metric Tons					2,361.20				2,361.20	1180.6				1,770.90	885.45			1180.6			41.321