Rapid Agriculture Needs Assessment in response to the "El - Niño" effects in the United Republic of Tanzania

February 2016

Mr. Matthias Mollet
Senior M&E, Assessment Specialist
Matthias.Mollet@fao.org

and

Mr. Daniele Barelli
Agriculture and Food Security Assessment Specialist
Daniele.Barelli@fao.org

Foreword

This rapid assessment report is the result of a joint effort of the Ministry of Agriculture, Livestock and Fisheries (MALF) and the Food Agriculture Organization of the United Nation (FAO), in order to better assist the population impacted by the effects of "El-Niño" in the United Republic of Tanzania.

Two teams composed by staff of the President Office - Regional Administration and Local Government (PO-RALG), Disaster Management Department (DMD), MALF and FAO assessed six of the most affected regions in the country namely Arusha, Dodoma, Mara, Mwanza, Morogoro, Shinyanga. The teams conducted Focus Group Discussions and Field Observations at village level with several affected communities in addition to interviews with Key Informants at district and regional level.

The report provides detailed information on the damages and losses endured by the affected population as well as some baseline information on the agriculture, livestock and fishery subsectors of the visited regions. In addition, it also describes the identified short, medium and long term needs and proposes suitable recovery interventions.

The Ministry of Agriculture, Livestock and Fisheries and FAO look forward to collaborating with additional national and international partners and stakeholders in order to respond to the needs of the affected population and assist them with due effectiveness and timeliness.

Dr. Florens M. Turuka
(Permanent Secretary – MALF)

Patrick Otto
(FAO Representative)

Acknowledgements

The assessment team wish to express its sincere gratitude to the Ministry of Agriculture Livestock and Fisheries (MALF), the President's Office - Regional Administration and Local Government (PO-RALG), and the Disaster Management Department (DMD) for their support throughout the implementation of this work. Special thanks goes to the team members of this assessment namely, Mrs. Shakwaanande R. Natai, Dr. Ssendi Lucy, Mr. Julius Crispin Moshi, Mr. Kalisa Diomedes, Ms. Kimambo Stella, Mr. Fredrick Kiango, Mrs. Marstella Mtalo and Mr. Khowe Malegeri who have been participating in the data collection exercise and provided valuable inputs during the compilation of this report, showing a very professional and committed attitude throughout the process.

Sincere words of thanks goes also to all the representatives of the Regional and District Offices of the PO-RALG, as well as other national and local stakeholders met during the assessment, in addition to all affected communities who have spared their time and shared their perceptions and hardship with us.

Last but not least, we would like to thank all the FAO staff in Tanzania Office for their support, particularly Mr. Otto Patrick (acting FAO - Representative) and Mr. Kivaria Frederick (FAO - Head of Programme) for their kind guidance during this work.

Executive summary

As results of the heavy rains attributed to "El-Niño" event, since October 2015, **more than 25 000 households have been directly affected** by floods in six assessed regions of the United Republic of Tanzania namely Arusha, Dodoma, Mara, Morogoro, Mwanza, and Shinyanaga. This has had severe repercussion on the livelihood of the affected population who have lost crops, agricultural inputs and tools, animals, pasture land and other sources of income such as agriculture casual labour, in addition to houses properties.

In order to estimate the damages and losses occurred in the agriculture sector and sub-sectors, thus assess the impact on the agricultural livelihoods and come out with necessary emergency response interventions, the Ministry of Agriculture Livestock and Fishery (MALF), the President's Office Regional Administration and Local Government (PO-RALG), the Disaster Management Department (DMD) with technical and financial support from FAO, jointly conducted a rapid agriculture needs assessment in the aforementioned most affected regions.

The key findings of the assessment show that **floods have been the most devastating natural hazard**. Despite this, heavy rains coupled with incidences of storms and hails led to additional problems resulting in water-logging of large agricultural and pasture areas, spread of animal diseases, accumulation of debris on agricultural land, mainly silt and stones, as well as collapse of animal shelters and storage facilities.

The **crop sector has been the most affected** with rice and maize cultivated areas resulted to be the most impacted, followed by cassava, pulses and vegetables. Many of these affected areas were totally destroyed by the effects of the floods or have resulted in reduction of production especially among important staple crops such as rice, maize, cassava, sorghum and millet, leading to decreased yield by approximately 41 percent, 57 percent, 30 percent, 58 percent and 38 percent respectively.

Agricultural inputs and storage / shelter facilities were also lost or damaged with 57 percent of respondents reporting loss of seeds, 27 percent loss of fertilizer, 12 percent loss of hand tools, 16 percent loss of shelter and others reporting on loss of food and inputs storage facilities. The effects of the floods also led to **blockage of irrigation schemes,** mainly due to deposition of mud and silt, collapse of channel in-lets and damages on pipes and other equipment. Nonetheless, irrigation access was reported to be very low among the communities interviewed, resulting in a less severe impact on this sub-sector.

On the other hand, **livestock**, considered as the most important productive assets and source of animal proteins across all six regions visited, **were also affected** but to a less extent compared to the crop sub-sector. Most of the respondents indicated loss of chickens (35 percent), followed by ducks (15 percent), goats (5 percent) and sheep (2 percent). Generally, bigger animals such as cattle were rescued in time, therefore resulting in negligible losses. In addition to animal losses, an increased outbreak of animal diseases was reported due to the fact that many areas were still flooded, resulting into prevalence of water-borne disease.

Changes in market prices, in relation to food commodities, were also underlined by the majority of the population affected across all regions. On average, prices of staple crops such as cassava, maize, sorghum and rice have raised by 60 percent, 40 percent, 37 percent and 18 percent respectively since the occurrence of the flood. Whereas for other food commodities such as green gram and sweet potatoes, prices have decreased by 48 percent and 10 percent respectively due to recent harvest.

The Average of live animal prices have also increased in areas without destocking since the beginning of the flood, especially for pigs (22 percent), cattle (13 percent), chicken (7

percent) and ducks (9 percent). Contrarily, most of the average live animal prices in areas of destocking have decreased compared to prices before the floods. The price of pigs decreased by 46 percent, goats (37 percent), sheep (35 percent), cattle (32 percent) and chicken (17 percent). Destocking is a clear sign of asset depletion triggered by failure of crops and the necessity to purchase food, new agricultural inputs and address other basic needs such as paying school fees, buying medicine, etc.

Crop production, followed by animal rearing and agricultural casual labour are considered the three most important sources of income for the communities assessed in order of importance. Considering the loss of crops and the impact on the livestock sub-sector, most of the vulnerable households, especially women, will need to still rely on casual labour to generate income. However, due to the effects of "El-Niño", **the demand to carry out agricultural labour activities such as weeding or harvesting has diminished,** leading to reduced possibility of income generation affecting the most vulnerable households.

Engagement in distress copying mechanisms was generally reported among the regions assessed, especially among women. Reducing the amount of meals per day was indicated as the most commonly used coping mechanism by 90 percent and 73 percent of women and men respectively, followed by purchasing food on credit (53 percent of women) and (36 percent of men) and relying on less preferred food (54 percent of women) and (49 percent of men).

In order to support the rehabilitation of the agriculture sector and its sub-sector, a set of recovery interventions are required in the short, medium and long term. **The most urgent interventions** (next six months) should mainly consist of the provision of crop and vegetable seed packages including hand tools. Restocking of poultry, together with provision of animal feed and vaccines especially to women vulnerable groups should be also considered. Delivery of food assistance to the most affected households is also necessary based on the results of the assessment. Whereas, **medium-long term interventions** should enhance the capacity of farmers and animal keepers to generate higher productivity, reduce post-harvest losses, increase their access to irrigation and mechanization, as well as aiming at increasing accessibility and marketability of both animal and agricultural products.

Monitoring of the agro-meteorological situation in relation to the upcoming main agricultural season is imperative in order to estimate the final implication of the "El-Niño's" effect on the livelihood of the population already affected and for those additionally exposed. A more in-depth food security and nutrition assessment at the end of the agricultural season (Jun / July 2016) is also needed to determine the situation in these areas. In fact, at present, the combination of the report' findings are already indicating a higher likelihood of food insecurity and malnutrition, especially in the affected areas.

Table of Contents

List of figures, tables, pictures and maps

List of Acronyms

AEZs	Agro-Ecological Zones
DMD	Disaster Management Department
FAO	Food and Agriculture Organisation of the United Nations
FGDs	Focus Group Discussions
ITCZ	Inter-Tropical Convergence Zone
KIIs	Key Informant Interviews
LGA	Local Government Authority
MALF	Ministry of Agriculture Livestock and Fishery
NGO	Non-Governmental Organization
PO-RALG	President Office - Regional Administration and Local Government
TMA	Tanzanian Meteorological Agency
TSh	Tanzania Shilling
UNICEF	United Nations Fund for Children's Fund
WHO	World Health Organization

1. General information and methodology

1.1. Background information

Heavy floods attributed to "El-Niño" rains have been occurring since October 2015, causing serious destruction on crops, livestock and other farmer's properties, including houses, specifically in Arusha, Dodoma, Mwanza, Kagera, Kigoma, Lindi, Mara, Mbeya, Morogoro and Shinyanga regions initially affecting more than 25 000 households. In addition, since January 2016, three additional regions were also hit by floods, namely Iringa, Katavi, and Manyara.[1]

This has threatened the livelihood, food security and nutrition situation of the affected households, as well as reduced food supply to the urban population. On 1st January 2016, Tanzanian Meteorological Agency (TMA) announced the "worst El-Niño coming". The agency said this year's rains would likely double the 1997 El- Niño's events that destroyed roads, washed away homes, bridges and farms, causing famine, waterborne diseases and leaving thousands of people homeless.

In response to the floods and the projected scenario, the Ministry of Agriculture Livestock and Fisheries (MALF), requested FAO to provide an emergency support in conducting a rapid agriculture needs assessment in order to estimate the impact on the agricultural livelihoods of the population affected.

This assessment would be have been a useful input towards the development of mitigation and resilience plans, and would also assist in planning the required emergency support to the affected households and communities.

1.2. Objectives of the survey

- Assess the major damages and losses caused by the floods on the agricultural sector and its sub-sectors including crop production, livestock, and irrigation.
- Assess the risks and vulnerabilities caused by the floods, especially in relation to agricultural livelihoods.
- Assess the immediate mitigation and recovery needs for the affected population who largely depend on agriculture for their livelihood and identify suitable short, medium and long-term interventions.
- Project a likely scenario in relations to the continuation of the already experienced "El-Niño's" effects.

1.3. The methodology

The assessment used a combination of primary and secondary tools for data collection and covered a sample of the affected region (see Annex a).

Checklists for Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) were also developed in order to gather all necessary pre and post-disaster information (see Annex d and e). In addition to this, reports, publications, newspaper articles and other secondary informative material were collected and analysed.

[1] Source: Ministry of Agriculture Livestock and Fishery and Disaster Management Department, 2016.

Two assessment teams were formed, each led by one FAO staff and joint by four representatives from the MALF, one senior officer from the President's Office Regional Administration and Local Government (PO-RALG) who is responsible for coordination of the Economic and Productive sectors - agriculture sector inclusive, together with one representative from the Disaster Management Department (DMD). All team members were briefed and detailed instructions were provided on the use of the different data collection tools and assessment methodology, before starting the fieldwork. MALF, and DMD, in close collaboration with FAO Tanzania, defined the locations to be assessed (districts / municipalities), within the affected regions.

The two teams travelled to the six most affected regions[2] in order to meet with representatives of the PO-RALG at region and district / municipality level, as well as other concerned actors. Initially, they conducted key informant interviews with these stakeholders mentioned above, before visiting the affected districts / municipalities where they undertook FGDs with the local communities, together with field observations. At least two FGDs in the selected regions were conducted with separate groups of men and women in order to compare the answers received and ensure gender desegregation as part of the assessment.

Picture 1: Women and men focus group discussions

1.4. Limitation of the assessment

Due to limited resources and time availability, this assessment did not cover all districts / municipalities affected in the assessed regions. For the same reason, four additional regions, Kagera, Kigoma, Lindi and Mbeya considered also affected by floods during October - December 2015, could not be taken into account as part of this assessment. Nevertheless, in order to overcome this limitation, a set of checklists were sent to the regional offices of the PO-RALG in these regions to get a better understanding of the floods impact. Despite this, the assessment team failed to get information from these offices which could have been added to this report.

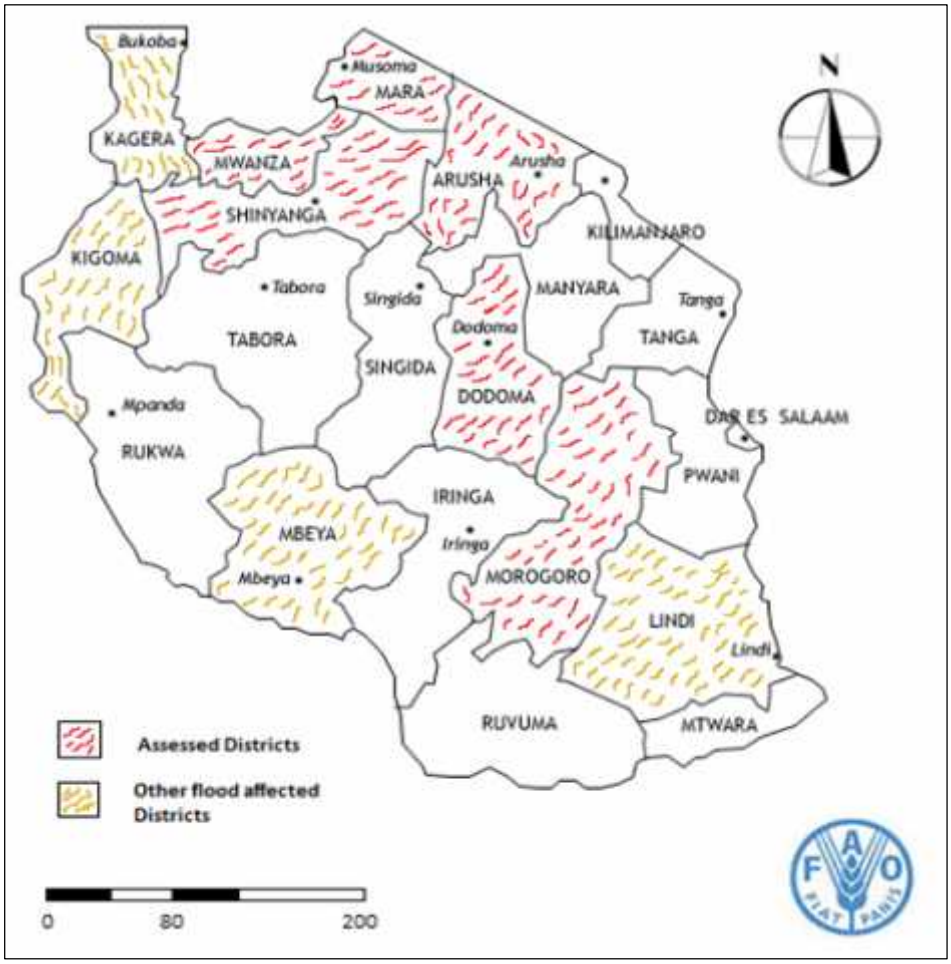
[2] Arusha, Dodoma, Mara, Morogoro, Mwanza, and Shinyanaga

Additionally, the methodology used during this assessment, did not allow to exhaustively estimate the effects of "El-Niño" to food security and nutrition. However, literature review and field observations were used to come up with the most realistic information on this regards.

Finally, most of the representatives of the regional and district offices visited did not have first-hand quantitative data and information available on the damages and losses caused by the floods. Hence, the process of data collection and analysis has been slightly delayed due to the need of collecting that key data.

The assessment took place at the end of the short agricultural season "*vuli*" and at the start of the long agricultural season "*masika*" in the bi-modal areas, where most crops were close to the harvesting period for "*vuli*" and in the land preparation stage for "*masika*". Whereas in uni-modal areas, most of the crops were in the planting and maturing phase, of the long agriculture season "*msimu*", since part of the green harvest starts in March, while the main one is in May - August. This situation allowed mainly estimation of the damages and losses on the "vuli" season, while for the "*masika* and *msimu*" season, although some impacts were caused on crops planted or in maturity phase, it was harder to measure the effect of the flood, especially in relation to the likely reduction of yield. Therefore a follow up assessment would be useful after the harvest of these two longer seasons in uni-modal and bi-modal areas, taking place between May and September.[3]

Map 1: Flood affected and assessed region



[3] Please refer to the crop calendar (figure 1) section 2.4.1 of this report for better understanding.

2. Overall characteristics of the affected region and pre – disaster situation

2.1. Agriculture in Tanzania

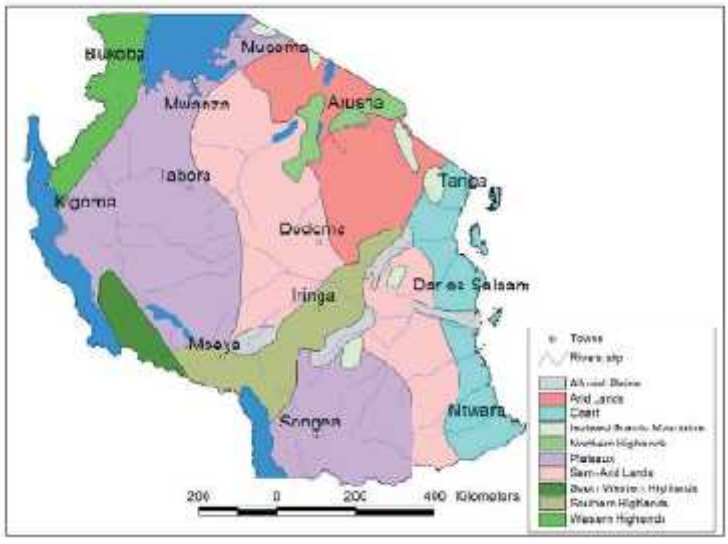
2.1.1 Socio-economic and livelihood

The agriculture sector is the backbone of the economy in Tanzania. It generates 25 percent of the GDP and contributes 30 percent of export earnings. Of this amount, livestock contributes nearly up to 5% and fishery slightly more than 1%. Agriculture provides livelihoods to over 80 percent of the population and employs 75 percent of the total labour force. Smallholder farmers tend to operate on a range of 0.9 to 3.0 ha, and are considered as the primary users of arable land ranging from 80 – 90 percent of agricultural land use under smallholder production.[4] Most smallholder farmers are women, with 98 percent of economically active rural Tanzanian women engaged in agriculture. In general, 55.2 percent of women and 44.8 percent of men in the country are engaged in agriculture.[5] Adoption of agricultural technologies is low, with cultivation generally done by hand tools (62 percent), animal traction (24 percent) and only 14 percent mechanized.[6]

2.1.2 Climate and Agro-ecological zones

Tanzania's climate is highly variable and complex. The climate is driven by tropical processes, the Inter-Tropical Convergence Zone (ITCZ), which influences rainy and dry season patterns. El Niño and La Niña years are associated with extreme flood and drought events. While annual seasonal temperature variation in different locations is fairly small (approximately 3-4 °C), variability for rainfall is much higher both geographically and seasonally with extreme dry and wet conditions over the course of the year. Alternatively dry conditions with heavy rainfall combined with inadequate land management in many areas, has exacerbated land degradation and increased vulnerability to weather-related shocks.[7]

Map 2: Main Agro-ecological zones of Tanzania[8]



4 Source: Tanzania Climate Smart Agriculture Programme (2015).
5 Source: FAOSTAT (2014).
6 Source: Sokoine University of Agriculture (2010), MAFC (2011).
7 Source: Enfors, E.I. & Gordon, L.J. (2007).
8 Source: Soikone University of Agriculture (2014).

High climatic variability results in a wide range of agro-ecological conditions, which allows for diverse agricultural livelihoods. Tanzania's agro-ecological zones (AEZs) range from higher rainfall areas on highlands and coast in the north, far west, south and southwest, and arid / semi-arid areas in the interior of the country (Map 2).

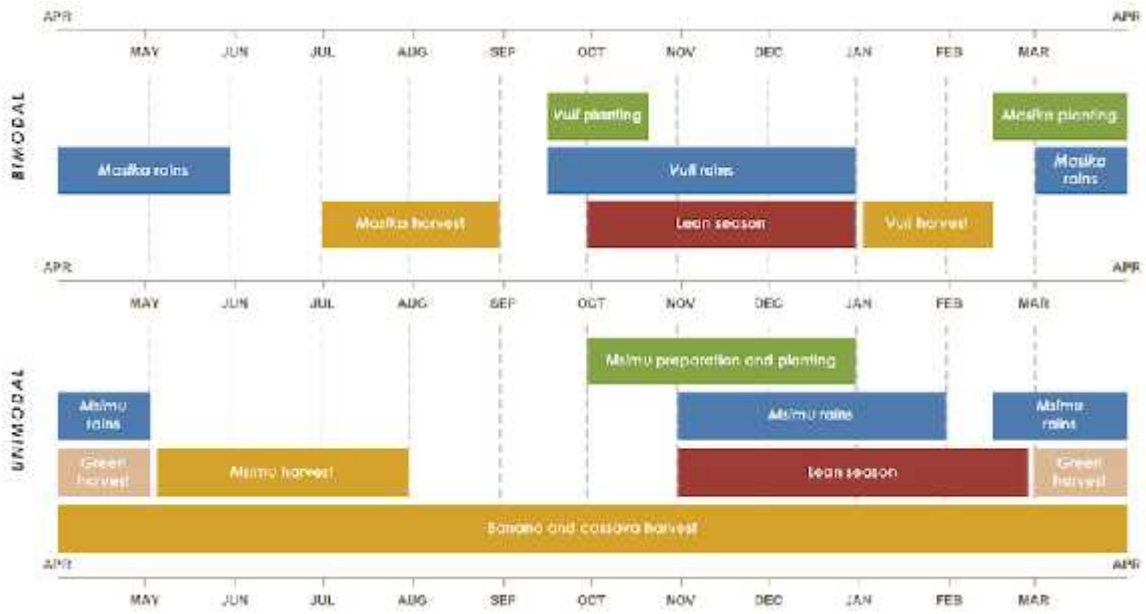
2.1.3 Agricultural land use

Tanzania has a total of about 7.1 million hectare (ha) of high and medium potential land (2.3 and 4.8 million ha respectively) suitable for irrigation, supported by rivers, lakes, wetlands and aquifers. Of the total 2.3 million ha classified as high-potential, only 461,326 ha had improved irrigation system in 2015, accounting for only 1.6 percent of the total land with irrigation potential. An estimated 55 percent of the land could be used for agriculture, and more than 51 per cent for pasture. However, only about 6 percent of the agricultural land is cultivated, and the practice of shifting cultivation causes deforestation and land degradation on pastoral land. Tanzania is one of the few countries in Africa that still has extensive wildlife resources and protected areas that account for about 25 per cent of its total land area.[9]

2.1.4 Agriculture, livestock and fishery / aquaculture production

Tanzania's cropping patterns are determined by the agro-climatic zones, falling under two broad categories: the uni-modal and the bi-modal rainfall areas. The latter is characterized by short-rains supporting the short cropping season, known as "*vuli"*, with planting around October / November and harvesting in late January / February, in addition to the main, long-rainy season, called "*masika*" which follows the "*vuli*" season, with planting starting in late February / March and harvesting in July / August. The bi-modal areas extend over the northern and north-eastern regions, including Kilimanjaro, Arusha, Moshi, Tanga, as well as Kigoma, Kagera, Mwanza, Mara and parts of Morogoro, Mbeya, Dar es Salaam and Coast. Elsewhere in the country, i.e. the central and southern highland regions, rainfalls are uni-modal, known as "*msimu*", with planting starting around November and harvest taking place from May to July, with exception of green harvest between March and May (Figure 1).

Figure 1: Crop Calendar[10]



9 Source: Ministry of Agriculture Livestock and Fisheries (2015).

10 http://www.fews.net/east-africa/tanzania/seasonal-calendar/december-2013

The contribution of the *"vuli"* season to total national food crop production averages 17 percent (about 15 percent in the case of cereals crops). The rest is attributed to the "*masika"* and *"msimu"* season.[11]

Tanzania's farming system consist of a diverse combination of crops, livestock, poultry, fruits, vegetables, fisheries and aquaculture products. Maize, followed by rice, cassava, sweet potatoes, wheat, beans, sugarcane, groundnut, banana and palm oil constitute the ten top commodities in the country and comparably reflect the main type of agricultural production.[12] Nevertheless, other cereals such as sorghum and millet still represent an important source of calories for the rural population. Cash crops such as coffee, cocoa, ginger, cardamom and cashew nuts are cultivated on smaller areas, but with higher economical returns.

Another significant component of the agriculture sector is livestock, including cattle, goats and sheep in order of importance, followed by poultry production which is widespread activity especially among women. Besides meat production, other products from livestock include hides and skin, milk and eggs. Livestock also contributes to crop and vegetable production by providing draft power for cultivation and organic manure.

Fishery and aquaculture are also additional sectors to be considered, however the number of people rely on these types of activities for their livelihood is much less compared to the one relying on the crop and livestock sub-sectors.

2.1.5 Food Security and nutrition situation

Despite Tanzania is considered to be overall food secure, there are still inter and intra-regional levels of vulnerability towards food insecurity. This is due to localized crop failure mainly attributed to drought, pest and disease as well as low accessibility to agricultural inputs such as improved seeds and fertilizers. Some regions and districts continue to have surplus of production, whereas others remain with pockets of persistent food shortage. On the other hand, prevalence of chronic malnutrition or stunting in the country remains very high (42 percent). In addition to that, the prevalence of underweight among children under five years is about 16 percent – considered as "medium" based on the WHO cut-offs level of public health significance, whereas global acute malnutrition is close to that percent.[13]

2.2. Importance of agriculture sector and sub-sectors in the assessed region

The six regions assessed fall under different agro-ecological zones. Due to different soil and climatic conditions, in each zone the rural population conduct diverse agricultural activities resulting in dissimilar varieties of crop cultivated, type of livestock reared, means for supporting livelihoods, etc. In addition to that, all six regions comprise both uni-modal and bi-modal rainfalls areas which results in the possibility of conducting two agricultural seasons "*vuli* and *masika*" in bi-modal areas and one *"msimu"* in the uni-modal ones.[14]

Arusha, Dodoma, Mara, Shinyanga and a small part of Morogoro are mostly found in Arid and Semi-Arid Land where maize together with sorghum and millet are considered the most important cereal crop production, followed by paddy rice and cassava cultivations, which are also considered important staple crops. Their importance differs from one area of production to another, according to food preference and climate condition, including availability of water (Figure 2).

11 Source: FAO/WFP Crop and Food Supply Assessment Mission to Tanzania (1998).
12 Source: FAOSTAT, 2014.
13 Source: Tanzania Nutritional Survey (2014).
14 These are two Swahili words meaning short and long term agricultural season respectively.

Livestock rearing is considered an important source of animal protein and income in these regions, however animal ownership is different among the communities with those households considered better-off owing larger heard of animals, usually composed by cattle, goats and sheep. Whereas, poorest households, mainly rely on poultry production, especially chicken and ducks. Pigs are also found in certain areas as part of livestock keeping. The average number of animal heads owned by smallholding households is: 13 cattle, 9 goats, 9 sheep, 3 pigs and 11 chicken.[15]

Fishing is also practiced across these regions, especially in certain areas of Mara and Arusha bordering the Lake Victoria, Manyara and Natron.

On the other hand, Morogoro falls under additional agro-ecological zones such as alluvial plains and plateaux which are usually exposed to higher rainfall and are generally considered more inclined to intensive agricultural activities and particularly suited for paddy (rice) production. Mwanza is also found in the plateaux zone, where the agricultural activities have similar characteristics to the one in Morogoro, in addition also fishery is practiced due to the vicinity of Lake Victoria.

Figure 2: Agro-Ecological zones and agricultural activities in the six assessed regions

Region	Agro-Ecological Zone	Main agricultural activity
Arusha	Arid Land	Livestock rearing and crop production
	Semi-Arid Land	Livestock rearing and crop production
Dodoma	Semi-Arid Land	Livestock rearing and crop production
Mara	Semi-Arid Land	Livestock rearing and crop production
Morogoro	Alluvial plains	Intensive agriculture, keeping of cattle, goats, sheep and poultry
	Plateaux	Intensive agriculture, keeping of cattle, goats, sheep and poultry
	Semi-Arid Land	Livestock rearing and crop production
	Southern and western highlands	Agriculture, dairy cattle keeping
Mwanza	Plateaux	Intensive agriculture, keeping of cattle, goats, sheep and poultry
Shinyanga	Semi-Arid Land	Livestock rearing and crop production

Population density and engagement in agriculture change across the six regions with Mwanza considered being the most populated region and Dodoma having the higher number of rural households (HHs) engaging in agriculture (Table 1).

[15] Source: National sample census of agriculture small holding agriculture, vol. III, livestock sector (2012).

Table 1: Total and farming population[16]

Region	Tot. population	Tot. Number HHs	Number of HHs engaging in agriculture in rural areas	% of HHs engaging in agriculture in rural areas
Arusha	1,694,310	376,336	150,145	39.9
Dodoma	2,083,588	450,305	346,925	77.0
Mara	1,743,830	308,483	218,364	70.8
Morogoro	2,218,492	501,794	297,424	59.3
Mwanza	2,772,509	481,107	242,869	50.5
Shinyanga	1,534,808	258,981	181,817	70.2
Tot.	**12,047,537**	**2,377,006**	**1,437,544**	

As presented in Table 2 below, these six regions are important centres of production for what is perceived as the main staple crops produced and consumed in the country. In fact these regions constitute nearly 30 percent of the national maize production, 32.1 percent of paddy, 53.5 percent of sorghum, 43.9 percent of millet and 31.1 percent of cassava.[17]

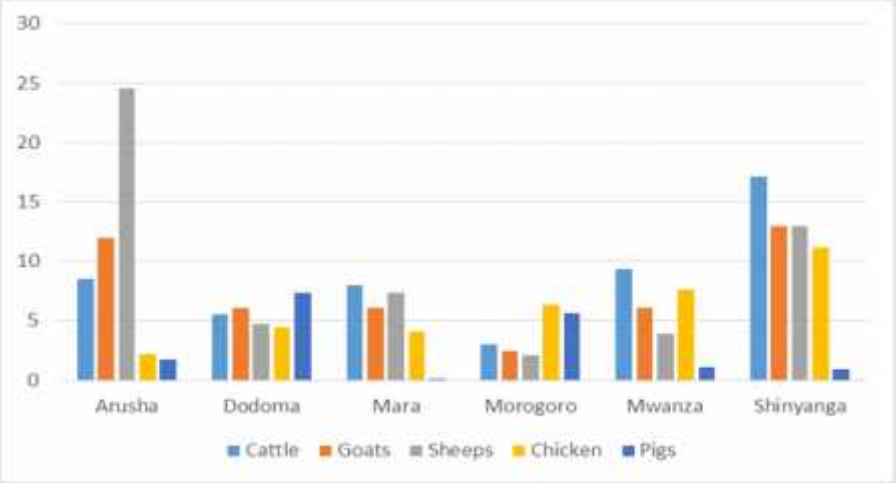
Table 2: Five years average cereal and cassava production and contribution to national production[18]

Crop parameters		Region Assessed						
		Arusha	**Dodoma**	**Mara**	**Morogoro**	**Mwanza**	**Shinyanga**	**Total**
Maize	prod. ('000' ton)	710.2	794.8	696.6	1040.4	779.7	1877.4	5899.3
	% nat. production	3.5	3.9	3.4	5.1	3.9	9.3	29.2
Paddy	prod. ('000' ton)	52.4	44.7	130.7	1472.3	829.5	25.9	2555.7
	% nat. production	0.7	0.6	1.6	18.5	10.4	0.3	32.1
Sorghum	prod. ('000' ton)	11.6	507.9	578.	65	271.2	565.8	2000.1
	% nat. production	0.3	13.6	15.5	1.7	7.2	15.1	53.5
Millet	prod. ('000' ton)	8.3	394.7	65	1.4	39.8	91.4	600.8
	% nat. production	0.6	28.9	4.8	0.1	2.9	6.7	43.9
Cassava	prod. ('000' ton)	0	452.6	1944.4	1159.7	1912.4	1317.5	6786.9
	% nat. production	0	2.1	8.9	5.3	8.8	6.0	31.1

Livestock rearing is also considered as an important practice across the six regions. Shinyanga alone hosts nearly 20 percent of all cattle reared in the country, followed by Mwanza, Arusha and Mara with 9.3, 8.5 and 7.9 percent respectively. Goat and sheep ownership are also widespread, especially in Arusha and Shinyanga hosting 24.5 percent and 12.9 percent respectively of all sheep in the country, followed by 12 and 13 percent correspondingly of goats. Chickens and pigs are also kept as part of livestock rearing, however these constitute minor proportion compared to other animals (Figure 3).

16 Source: Tanzania Census (2012).
17 These data refer to five years average production (2005 - 2010)
18 Source: http://www.kilimo.go.tz/agricultural%20statistics/angricultural%20statistics.htm

Figure 3: Share of livestock types across the six regions from national total numbers



Men are usually engaging in bigger animal rearing such as cattles, goats and sheep. Whereas, women generally look after smaller animals such as poultry (chickens / ducks) and pigs.

As shown in Table 3 only a very small share of the rural population in the visited regions are involved in fishing activities, mainly inland fishing in the lakes and rivers.[19]

Table 3: Number of households involved in fishing activities by region

Region	Total number of HHs	HHs involved in fishing	% HHs involved in fishing
Arusha	376336	905	0.2
Dodoma	450305	1105	0.2
Mara	308483	1623	0.5
Morogoro	501794	1884	0.4
Mwanza	481107	1537	0.3
Shinyanga	258981	956	0.4
Tot.	**2377006**	**8010**	**2.1**

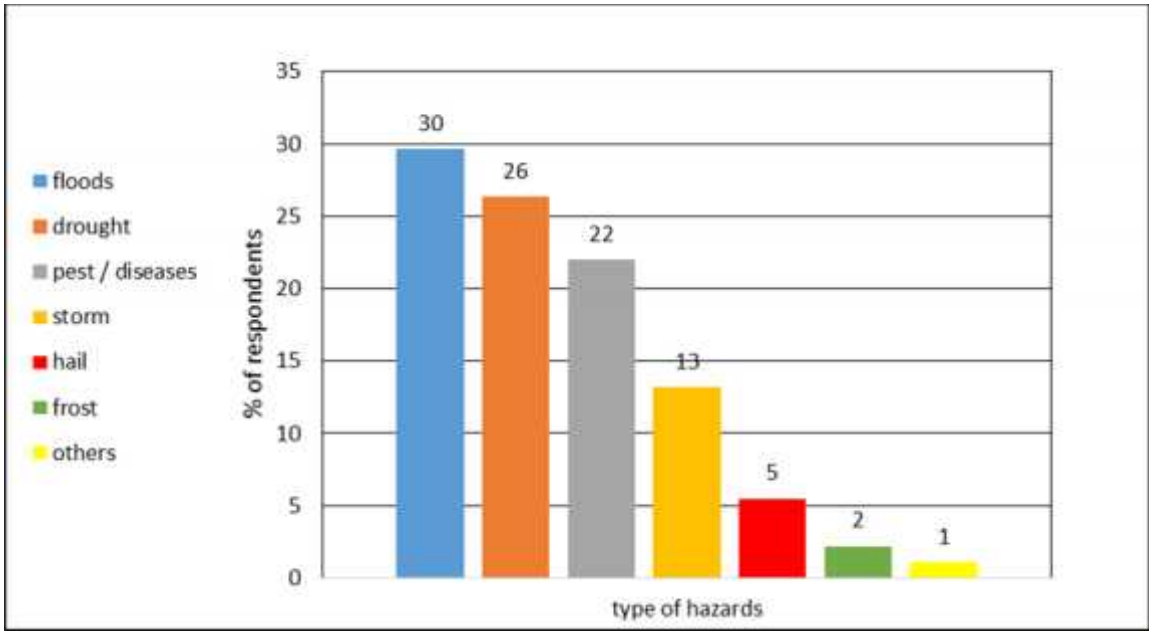
[19] Source: Tanzania Census (2012)

3. Results of the assessment

3.1. Risk and vulnerability

Through changing temperatures, increase in precipitation and sea levels rise, amongst other factors, global climate change is already modifying hazard levels and exacerbating disaster risks. Economic losses from disasters such as earthquakes, cyclones, floods, etc. are now reaching an average of USD 250 to 350 billion each year.[20] In addition to this, Southern Africa, including Tanzania, is currently under the grip of an intense "El-Niño" event, which is considered the worst in the last 50 years.[21] This country, is regularly exposed to such types of events, however what is occurring this 2015 / 2016 agricultural season is very similar to what took place in 1997, where the agriculture sector experienced heavy losses and damages coupled with the destruction of key infrastructures (i.e. houses, roads, bridges and irrigation schemes). Figure 4 shows the frequency of the natural hazards affecting the visited regions, based on the Focus Group Discussions' (FGDs) results, where floods and drought are considered the most frequent ones, followed by pests and diseases, storms and very rarely hail, as well as frost and other hazards. Mwanza region has the highest rate of natural hazards recurrence, followed by Arusha, Dodoma and Mara regions. Morogoro and Shinyanga regions are instead usually less affected.

Figure 4: Main natural hazards experienced by the communities



As mentioned before, the frequency of the different natural hazards differs from one type to another. Although floods are considered as the most impacting hazard, and usually the less recurrent, respondents indicated that their occurrences cause the most severe impact while also affecting larger agricultural areas. On the other hand, droughts are more frequent as they are taking place almost every season but their impact is restricted to some regions or districts / municipalities. Even when storms are happening regularly, their impact is much more localized; compared to pest and disease outbreaks which happen seasonally but affects larger areas or high numbers of animals, see details in Table 4.

[20] Global Assessment Report on Disaster Risk Reduction (2015)
[21] http://www.fao.org/news/story/en/item/382932/icode/

Table 4: Frequency of natural hazards

Type of hazards	in % of respondent			
	rarely	regularly	seasonaly	yearly
floods	73.3	14.3	26.5	0.0
drought	13.3	14.3	29.4	70.0
storm	13.3	71.4	2.9	0.0
pest / diseases	0.0	0.0	35.3	20.0
frost	0.0	0.0	2.9	0.0
hail	0.0	0.0	2.9	0.0
others	0.0	0.0	0.0	10.0

3.2. Impacts on the affected livelihoods

3.2.1. Crops

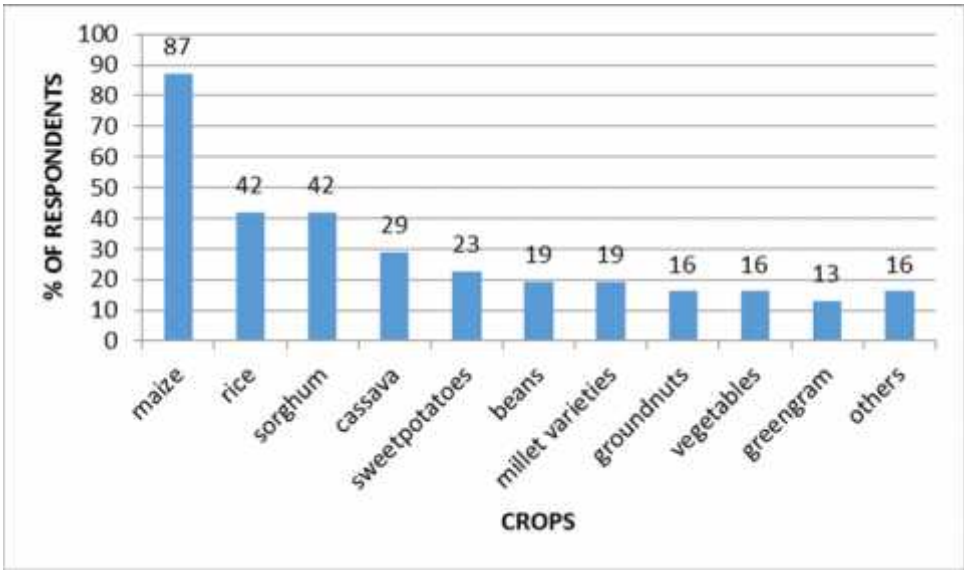
For over 85 percent of the assessed population, crops production is the main source of income. On average each male headed household cultivates an area of 8.3 acres, whereas a female headed household 3.5 acres. In Arusha and Dodoma regions the cultivated areas were reported to be at above average for male headed households and below average in Dodoma, Morogoro and Mwanza regions for female headed households (Table 5).

Table 5: Area in acres owned by male and female headed households by region

Type of household	Region					
	Arusha	Dodoma	Mara	Morogoro	Mwanza	Shinyanga
Male headed	12.5	9.9	7.7	5.6	6.6	7
Female headed	5.6	2.9	3.3	2.8	3	4.8

Maize resulted to be the most cultivated crop, followed by rice, sorghum and cassava. Thereafter pulses, sweet-potatoes and oil crops as well as vegetables and others like ginger or cardamom are cultivated by a smaller proportion of the population, see details in Figure 5.

Figure 5: Households cultivating specific crops



Most of the flooded agricultural lands were found to be located in lowland areas which are usually considered to be the most prone to flood disaster. The utmost common damages reported in the crop sub-sector were caused by waterlogging, whereby the cultivated crop could not survive over a long period of time (especially maize and cassava). In addition to that, flash floods, expansion of riverbed, and debris deposition (silt, rocks, wood, etc.) caused further destruction on the cultivated crops.

Picture 2: Flooded agricultural field with water still receding

The crop with the largest proportion of the cultivated area affected is rice, followed by maize, cassava, sorghum, green gram, sweet-potatoes, beans, groundnuts, vegetables and bulrush millet (Table 6).

Table 6 : Percentage of cultivated areas affected, destroyed, recovered and with reduced yield

Crop	Overall impacted area (%)	Area destroyed (%)	Area affected with reduced yield (%)	Area with possibility of recovery (%)	Reduction of yield in affected area (%)*
Rice	64.5	35.8	62.5	1.7	41.3
Maize	44.5	64.6	23.2	12.2	57.3
Cassava	28.8	76.7	13.3	10.0	30.0
Sorghum	24.3	77.1	9.3	13.6	58.0
Green gram	23.8	70.0	30.0	0.0	72.5
Sweet potatoes	20.0	100.0	0.0	0.0	N/A
Beans	17.3	100.0	0.0	0.0	N/A
Groundnuts	13.0	22.0	52.0	26.0	60.0
Vegetables	11.0	100.0	0.0	0.0	NA
Bulrush millet	7.5	7.5	7.5	85.0	37.5

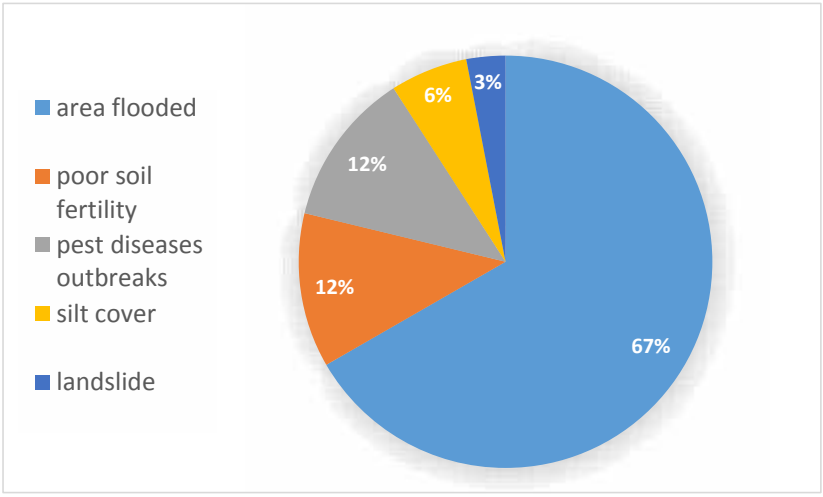
*reduction in yield concerns only the areas which have been affected but still will produce some harvest, therefore are directly related to third column of this table.

Even when the overall cultivated areas of sweet potatoes, beans and vegetables were reported to be less affected, these areas were entirely destroyed leading to 100% loss of the standing crops. Whereas, areas cultivated with cassava, sorghum, rice and maize, reported losses of standing crops at around 76%, 77%, 36%, and 65% respectively. Only groundnuts and

bulrush millet had lower levels of destructions corresponding to 22% and 8% respectively; this is mainly due to the fact that they are mostly cultivated in sandy soil which can absorb the water in excess quicker.

The remaining affected areas will either have a reduction in yield or to a lesser extent will be able to recover until harvest time, especially in the case of bulrush millet and groundnuts. The estimated yield reduction ranges from 30% up to 73%, depending on the crop as reported in Table 6 and region specific data in (Annex c, Table 13). The main causes of yield reduction are in decreasing order of importance: flooded areas / stagnant water, poor soil fertility, pest or diseases outbreaks due to higher level of humidity and breading grounds for insects, debris coverage and deposition (mud or silt) and landslides, see actual percentages in Figure 6.

Figure 6: Reasons for reduced yields in the overall affected cultivated areas (percentage of respondents)



Additional discussions with the farmers helped to understand that on top of the above mentioned reasons, reduction of crop production estimates were also based on the results of some harvested crops in comparison to last year's production, and visual observation, also looking at the maturation stage of the crops affected still on the field.

Mrs. Agness Ngassa, affected farmer

Mrs. Agnes, a farmer, 46 years old lives with her daughter in Igembya village in Shinyanga DC (Shinyanga region). On the 4th of January 2016 around 9 pm when she was sitting with her daughter in the main house, heavy rain started pouring accompanied with strong winds.
"We could hear a heavy sound then the roof of our three bedroom's house was swept away and bricks started falling from the top of the house. My daughter Hadija was hit by a brick on her arm then she fell and another brick fell on her knee. It was dark but we could hear the house falling apart. We ran outside the house crying loud to our neighbour just to find that their house was also collapsing".
In the big house they had stored 6 bags of maize that was soaked and some fell out of the sack that was washed away. Only few buckets were rescued. About 2 acres of maize were also destroyed and 6 chickens were swept away. Mrs. Agnes does not have any money to buy more maize because that was the entire stock and now she rely on support from other people from the village. Whenever she see clouds the fear for the worst comes again. Her daughter cannot go to school as her arm still hurts and her uniform and other clothing was also swept away by heavy rain. They are waiting for some external assistance (tents and food) in order to alleviate their desperate situation.

3.2.2. Agricultural inputs, assets, facilities and infrastructures

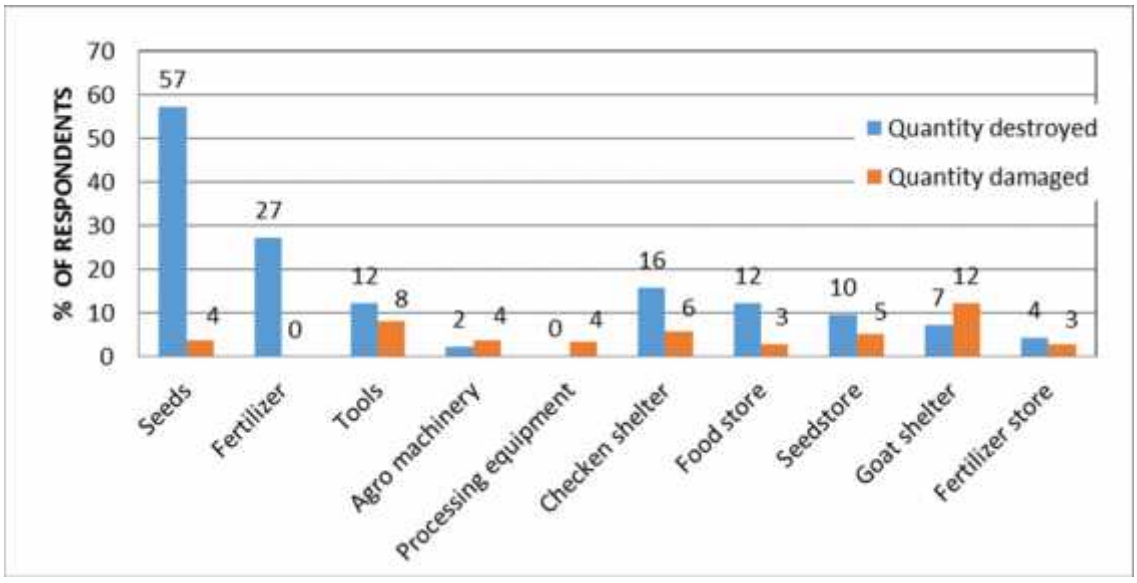
Seeds and other agricultural inputs such as fertilizers, pesticide and tools are key assets for small scale self-sufficient farmers. The effects of the heavy rain occurred in the assessed regions led to the loss of planted crop seeds ranging between 25 percent in Shinyanga to 88 percent in Dodoma with an average of 57 percent among all regions visited.

Up to 50 percent of the already applied fertilizer (mainly animal manure) was lost in Dodoma region, whereas the other regions experienced losses by 35 percent with exception of Mara where no losses were reported.

Tools losses range from 2 percent in Mara up to 44 percent in Morogoro region, with an overall losses average of 12 percent. These losses of assets have led to the failure of crop production and the impossibility of resuming farmers' activities, which will have an implication on the livelihood of the population affected.

In addition, but to a much smaller extent, some farm machineries and equipment, as well as farm storage facilities were also reported lost or damaged with higher rates in Dodoma and Arusha regions and almost none in the remaining regions – as less households owned such type of assets.

Figure 7: Main agricultural inputs, assets and facilities destroyed or damaged



Access to irrigation is very limited among all assessed communities. Despite this, in Shinyanga, Arusha and Mwanza regions, access to traditional gravity irrigation schemes were reported by 55 percent, 33 percent and 1 percent of the population respectively. Most of the irrigation schemes were reported to be damaged by the floods (channels blocked due to deposition of mud and silk, collapse of channels' edges and pipe broken or blocked). This will require some reparation, including substitution of parts, together with additional maintenance.

Last but not least, also damages to roads connecting to markets and rural communities, as well as railways and bridges were also observed during the fieldwork mission, especially in the more remote areas across all regions visited.

3.2.3. Livestock, fishery and aquaculture

In general, animals are considered to be important productive assets across all six regions assessed. Bigger livestock such as cattle are used as draught animals, especially for land

preparation and transport of food commodities. Furthermore, they are also considered important source of savings together with goat, sheep and pigs, since they can be sold at any time when cash is needed; whereas, chicken are mainly used for production of eggs and meat. Animal products (milk, eggs, wool, skins and meat) are also an important source of food or income.

Almost all the households in the visited regions own some animals. Therefore it is not surprising that livestock and their products are the second source of income for 60% of them. Whereas, for 10 percent and 30 percent of the households, animals constitute the first and third source of income respectively.

The results of the FGDs and field observation indicates that the occurred floods caused the death of different animals across all regions assessed, especially poultry, as indicated in Table 7. In Dodoma region, households have the lowest rate of ruminants compared to most of the other regions but they have the highest rate of chicken; whereas, in Arusha, Mara and Shinyanga they have the lowest rate of poultry. Pigs were mainly reported in Dodoma and Shinyanga, while they are almost absent in the other regions.

Table 7: Overall frequency of animal holding, rate lost and sick

Type of animals	Household with animals (%)	Animals lost (%)	Animals sick (%)
Chicken	35.1	35.3	0.7
Ducks	11.5	14.7	0.0
Goat	19.0	5.0	2.7
Pigs	5.9	2.7	0.0
Sheep	12.1	1.7	0.5
Cattle	34.5	0.1	0.2

The highest rate of animals lost was recorded for chicken ranging from 74 percent in Dodoma to 17 percent in Mara and around 23 percent in Arusha and Mwanza. The second highest loss was reported in Dodoma and Arusha for ducks, followed by goats and to an almost negligible extent for pigs in Dodoma. Sheep losses were mentioned in Dodoma and Mwanza. Cattle losses were reported on a negligible amount in Arusha and Mwanza (see Annex c, Table 16). Higher losses attributed to smaller animals are due to the fact that bigger livestock were moved to safe areas in time.

The actual percentages of sick animals directly linked to the floods are quite low, but this could still increase together with disease outbreak. In fact, some areas are still flooded and the prevalence of water borne diseases (endo-parasites) might escalate as well since the stagnant water is the breeding ground for the vectors (insects) of other animal diseases.

Picture 3: Drowned pigs

FGDs' results revealed that among the households rearing livestock only a small percentage vaccine them. This is due to the high prices, poor knowledge on the importance of animal vaccination and low accessibility to vaccines. Nonetheless, the livestock owners who are using vaccines, are directly purchasing them or accessing them through the government at subsidized price.

Fishery activities were reported only by 5 percent of households as a third source of income in Mwanza and Mara regions. In addition, only in one district of Mara region were reported some losses and damages on fishing gears, nets and hooks, as well as damages to boats / canoes, landing sites and fish shades to a negligible extent.

Mr. A. Ezekiel, affected farmer and livestock keeper

Mr. Ezekiel is a 52 years old farmers and livestock keeper living in buchanchari village, Serengheti DC (Mara region). He has 18 child and three wives, who all depend on his farmland and animal production as main sources of livelihood. Mr. Ezekiel is usually a "better off" farmer since he owned about 12 acres of land, 13 cows, 6 calves, 7 goats, and many chickens, which allow him to produce a good amount of food and income to support his household. However, the heavy rain of last year, occurred around the end of November 2015, have heavily affected Mr. Ezekiel agricultural land and all 12 acres planted with maize were entirely destroyed.

In fact, the water has taken long time to recede and the maize, still at the beginning of the vegetative stage, could not survive into the flooded soil. According to him, the maize could have produced over 200 bags if reaching maturity, resulting in approximately 2 tons of production. Sadly, this agricultural season, due the flood, Mr. Ezekiel will not be able to produce a single bag of maize and his main source of food and livelihood is entirely lost.

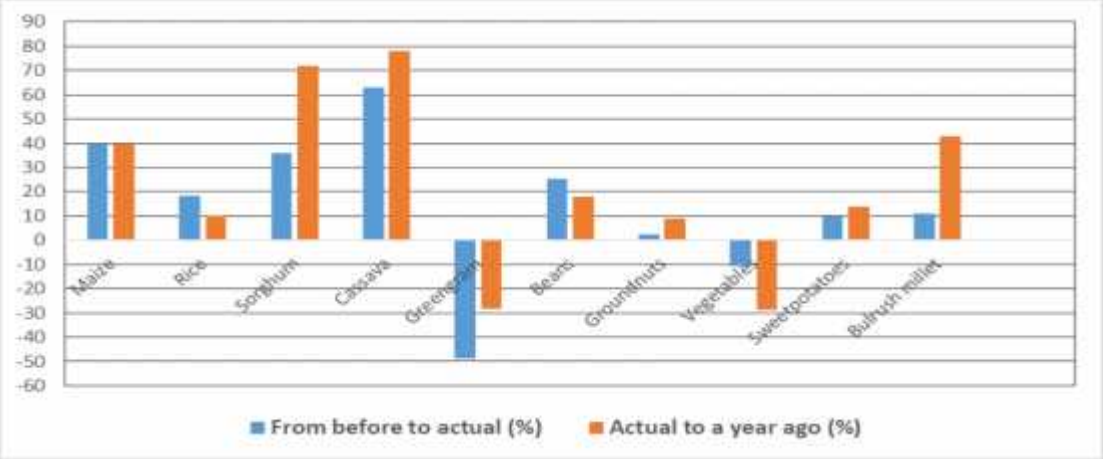
"This is a very unfortunate event, I have cropped this land for the past 20 years and I have never experienced such lost. Now, I am in real trouble. I have to sell at least 5 to 6 adult cows to buy the necessary food and despite this, I will not have enough cash to pay for the school fees of my children".

3.2.4. Markets and prices

Markets infrastructures such as stand and storage facilities were overall not affected by the floods. Despite that, some remote areas across all six regions were isolated due to the interruption and damages of feeder and secondary roads which reduced accessibility to market and inhibited the transport of goods. While in most affected areas the road communication has already been restored, transportation costs have increased in all the assessed areas.

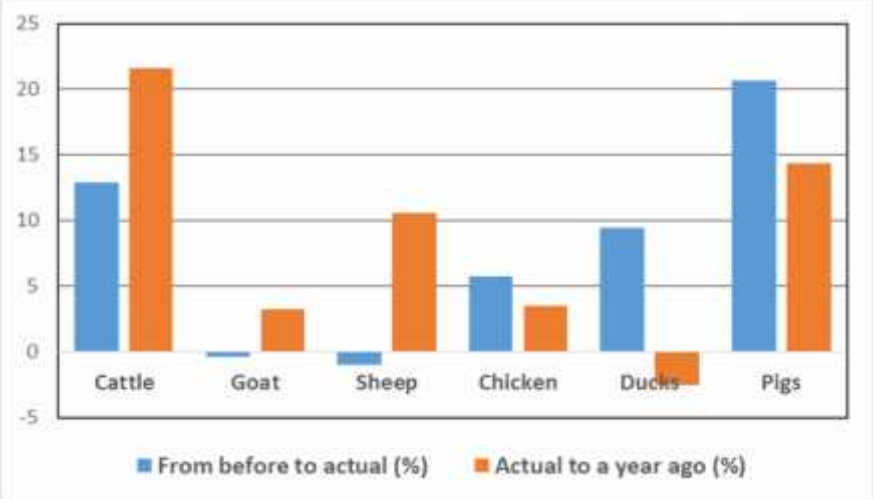
This situation, coupled with the reduced crop production and the higher demand of food commodities led to a significant increase of market prices for almost all agricultural commodities, especially sorghum, cassava, maize and millet, which are considered key staple food commodities as indicated in Figure 8. The analysis conducted compared current prices with both the prices before the floods (September / October 2015) and those of last year during the same period (February 2015). Exceptions were found for green gram and vegetables commodities as most of them were already harvested when the floods occurred resulting in reduced losses and higher availability in the market.

Figure 8: Variation of market prices (crop commodities)



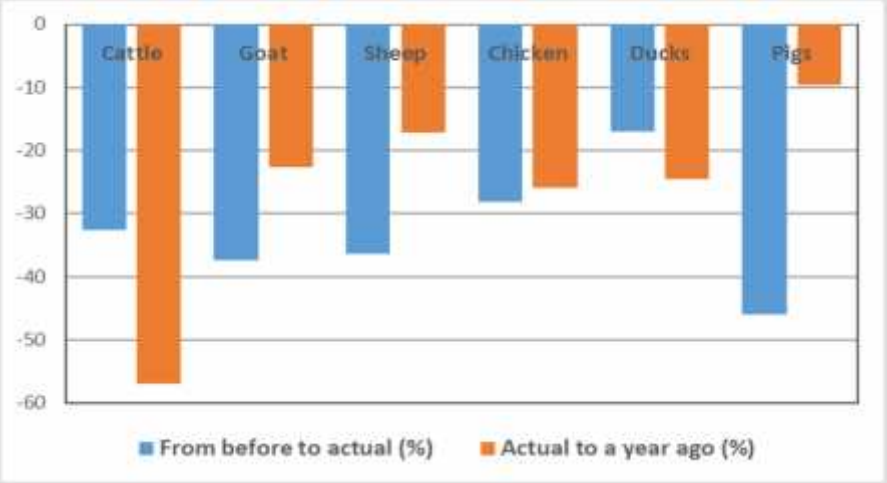
On the other hand, two different scenarios of market prices for live animal were observed. In some districts / municipalities of Mara, Morogoro, Arusha, Mwanza and Shinyanga namely, Bunda, Kilosa, Meru, Mvomero, Sengerema, Shinyanga, most of the prices increased as no destocking activities were taking place, especially for pigs and cattle, see Figure 9.

Figure 9: Variation of live animal prices in areas without destocking



In other affected districts of Dodoma and Mwanza namely Chamwino and Kwimba, the prices for live animals have decreased as emergency destocking was taking place in those areas, see Figure 10. FGDs' respondents, reported that animal destocking is necessary in order to generate immediate cash to access food and / or cover additional expenses (school fees, health related costs, etc.), due to the failure of their crop production, which generally generates most of their income. Destocking is a clear sign of an ongoing depletion of assets that in long run might have repercussion on the livelihoods of those households engaging in this type of copying mechanism.

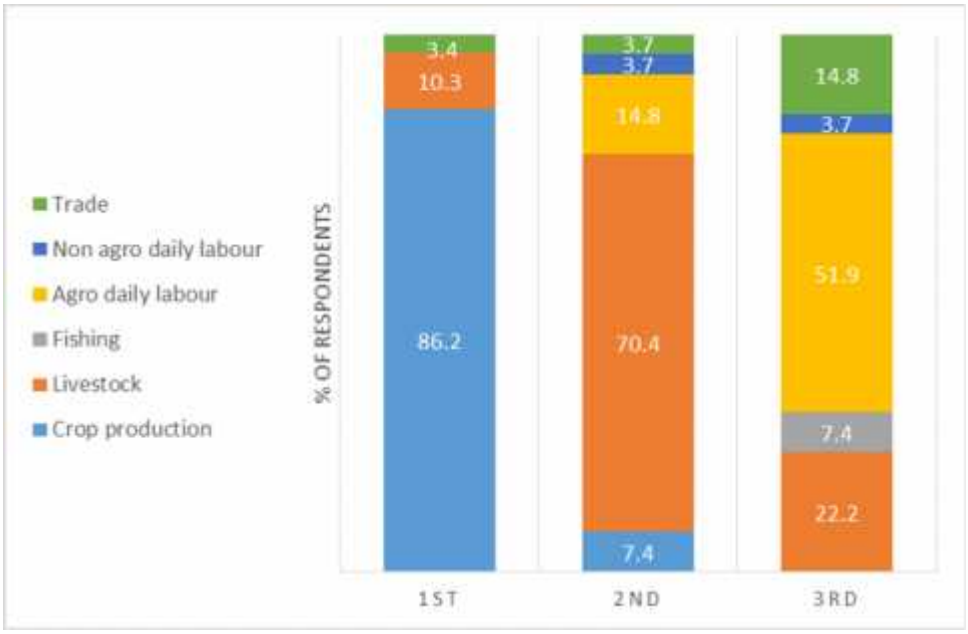
Figure 10: Variation of live animal prices in areas of destocking



3.2.5. Main source of income

Crop production, livestock keeping and agriculture daily labour are considered the first, second and third most important sources of income respectively. Whereas, non-agriculture daily labour was reported only in Arusha and Morogoro and fishing in Mwanza and Mara regions which border Lake Victoria, see Figure 11.

Figure 11: Main income sources



When asking about the agriculture daily labour, respondents mentioned that both men and women are equally engaged in this type of activity. Even so, transplanting and threshing are mainly conducted by women, whereas animals grazing is done more frequently by men. The daily wages of the different activities ranges from 2'000TShs for threshing to 3'000TShs for grazing and planting.[22] Weeding, harvesting and transplanting are paid at around 5'500TShs. The most remunerative activity is land preparation / ploughing, which costs up to 10'000TShs and might also include the use of draught animals, see Table 8. Overall women are earning an average of 18 percent less than men.

Table 8: Agriculture daily labour activities by gender and wages

Activities	Men (%)	Women (%)	Men wages (TSh / day)	Women wages (TSh / day)
weeding	46	54	6400	5000
harvesting	45	55	5400	5000
transplanting	40	60	6500	4900
threshing	30	70	2000	NA
ploughing / land preparation	56	44	10000	NA
planting	50	50	NA	3000
animal grazing	80	20	3000	NA

In addition to that, some respondents, indicated that in some cases they are also receiving food in exchange of labour and the amount depend on the market prices of the commodities received at that moment.

Mr. L. Mtalei, affected farmer

Mr. Mtalei is an elderly man 68 years old, living in Masahunga village, Bunda DC (Mara region). He is the head of the household and lives with his wife, 3 sons and 2 daughters. Mr. Mtalei main source of livelihood is farming, although 2 of his sons support the household with some fishing. During the heavy rains occurred at the beginning of December 2015, his house and farmland were entirely flooded and destroyed. Almost three acres of cassava and maize were affected, resulting in no production. In addition to that, the flood washed away about 60 kg of food stock (mainly rice), all savings, cloths and house' facilities, severely affecting the life of Mr. Mtalei and his family.

"It was around 11 am, my wife and daughter were at the rice farm, whereas my boys were fishing. I was paying a visit to my neighbor, when it started raining very intensively. For about one hour, I could not move and when I went back home my house did not exist anymore….what I saw was unbelievable…."

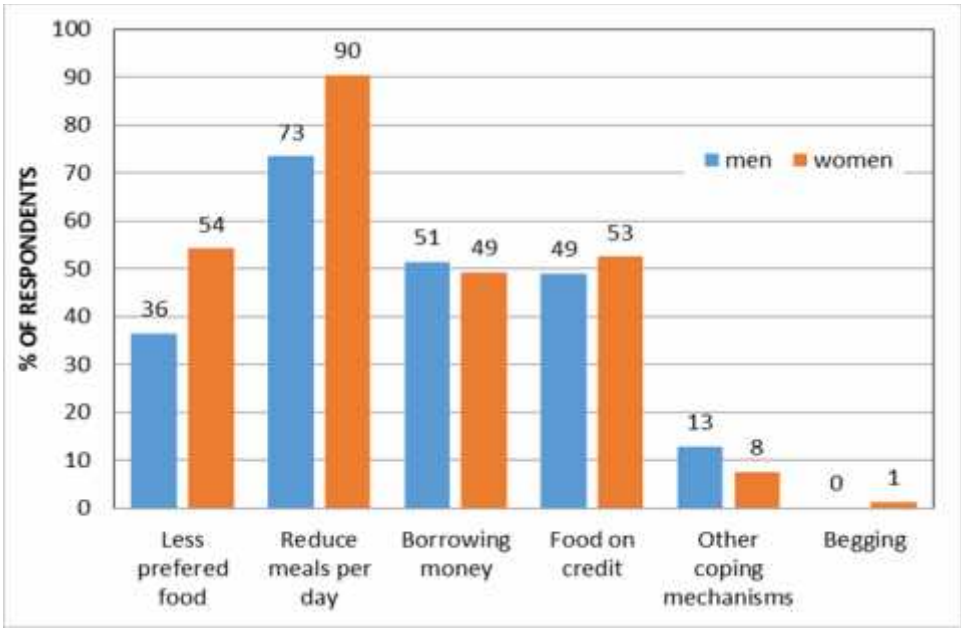
Mr. Mtalei and his family are now living in a tent provided by the government and are waiting the end of the agricultural season to move in a new place more upland. He hopes, that the 2 remaining acres of rice will produce a good amount of food and that the sons will be able to catch enough fish to support the household.

[22] Exchange rate: 1 US Dollar = 210 Tanzanian Shilling

3.2.6. Change in livelihood coping mechanisms

Across all regions assessed, there was a general reported increase of distress copying mechanisms in response to the effects of the floods, especially among women. Reducing the amount of meals per day was reported as the main copying mechanism by 90 percent and 73 percent of women and men respectively, followed by purchasing food on credit and rely on less preferred food, see Figure 9.

Figure 12: Frequency of use of coping mechanisms



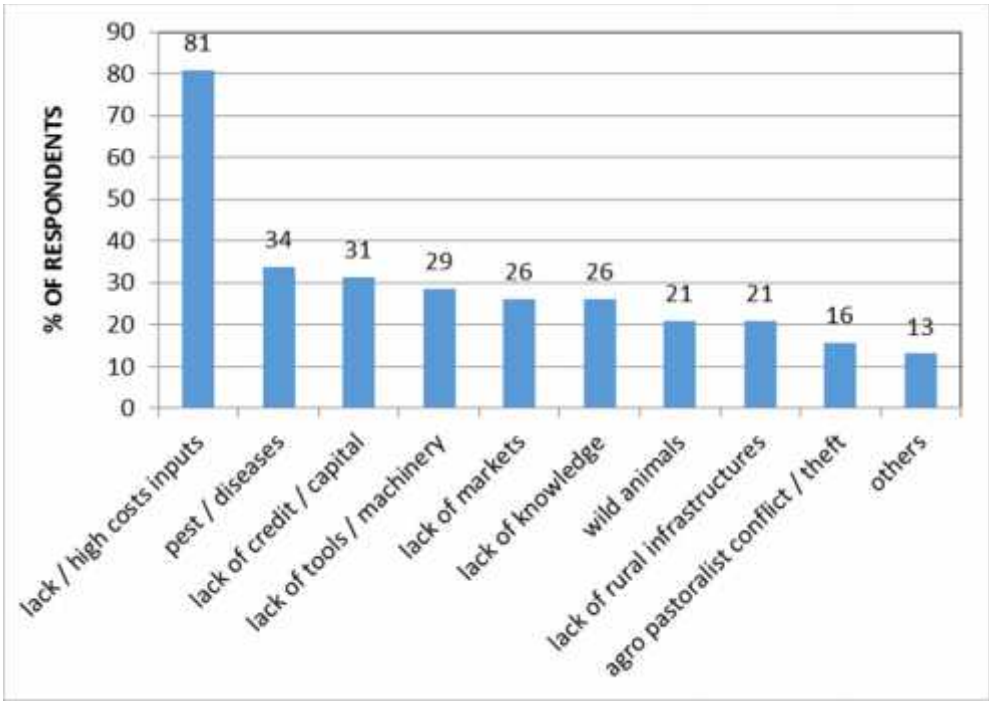
Borrowing of money to access food and other primary commodities such as agricultural inputs or medicines or getting food on credit was also indicated as widespread practice. The engagement of such negative mechanisms might have a negative impact on the food security and nutrition situation of the affected population and also lead to an increase of indebtedness due to the impossibility of paying back the loan.

3.3. Main agriculture and livestock constraints and needs

3.3.1. Constraints

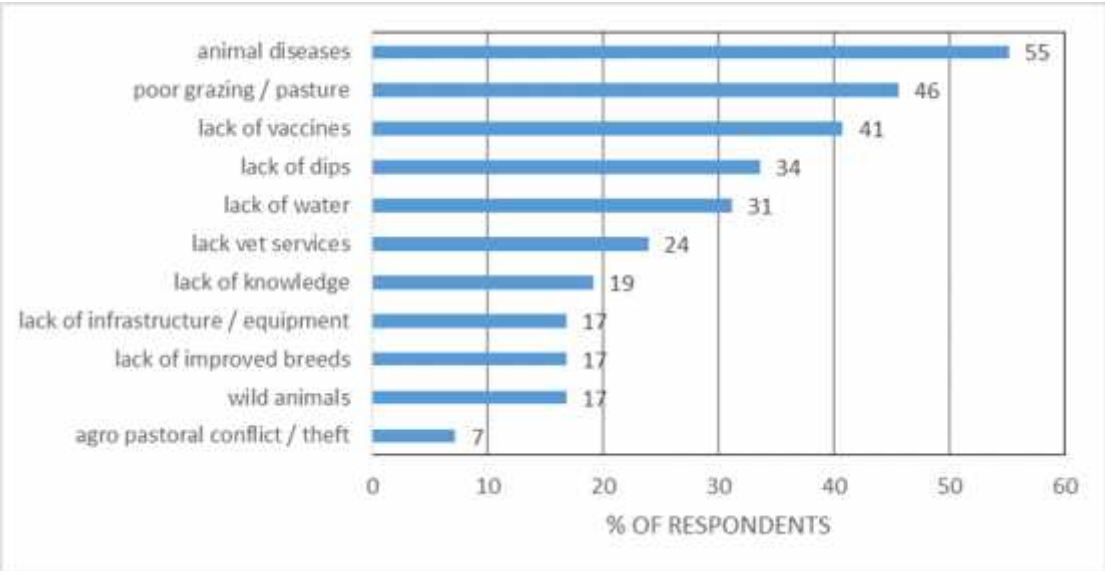
In addition to the impacts and effects caused by the occurred floods across the six regions assessed, which are described in the above sections of this report, farmers are facing additional direct and indirect constrains that limit their agriculture and livestock production. Lack or higher costs of inputs was reported by 81 percent of respondents, followed by higher incidence of crop pests / diseases outbreaks (34 percent), lack or reduced availability of capital or access to credit (31 percent) and others constrains as land tenure problems, lack of service providers and poor storage facilities as presented in Figure 10 below.

Figure 13: Percentage of main constrains reported for crop production



On the other hand, the main constrains on livestock production refers to the outbreak of animal diseases and invasion of pests, poor or lack of grazing land / pastures, lack of vaccines, lack of dips, lack of suitable water for animals and lack of veterinary services as presented in Figure 14.

Figure 14: Main constrains reported for livestock production



3.3.2. Needs for crop and livestock production resumption

In order to better understand the main needs of the assessed communities and allow the affected households to resume their agriculture and livestock activities, some discussion were held during the community level meetings to better define short, medium and long term needs. The needs expressed by the respondents below are not necessarily linked to the floods 'effects, as some reflect the challenges faced by the affected population before the

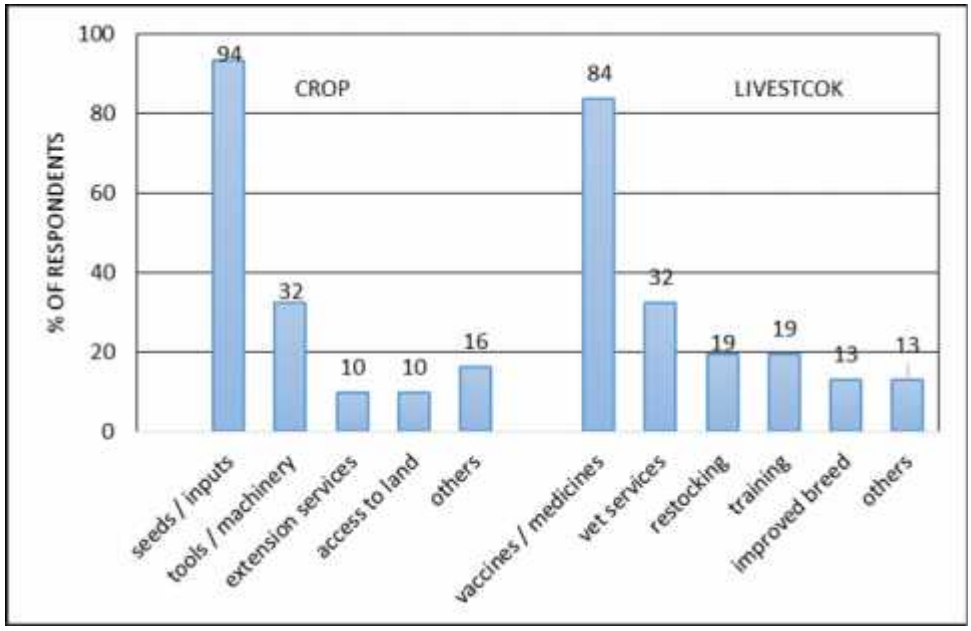
happening of the events; even so a large proportion of these needs, especially those in the short-term, are reflecting to the impact caused by the floods.

Overall no significant differences were recorded between the male and female FGDs. Nonetheless, women were more interested on short term needs such as the provision of food assistance and vegetable seeds, followed by poultry restocking. On the other hand, male's focus was more on medium and long term needs related to enhancing the crop and livestock production through the provision of farm machineries and equipment, as well as by ensuring the rehabilitation or construction of additional rural facilities (processing, etc.). Both groups of men and women were very much interested in the provision of trainings. Female respondents emphasized the importance of having trainings on marketing and rearing of small livestock (mainly chicken) as well as post-harvest processing technologies. Whereas, male respondents were keen to receive trainings on improved crops technics and livestock production.

3.3.3. Short term needs

Generally, to restore crop production, the provision of seeds / fertilizers was indicated as the most important priority by over 90 percent of the respondents, followed by supply of small agricultural tools and machineries (above 30 percent) in addition to others needs such tree planting, storage bags and protection from wild animals (Figure 15). In regards to livestock, over 80 percent of respondents identified provision of vaccines / medicines as the most important need, followed by increase access to veterinary services (32 percent) and restocking of small animal (19 percent). Others needs include access to fodder and pastures as presented in Figure 15.

Figure 15: Short term crop and livestock needs



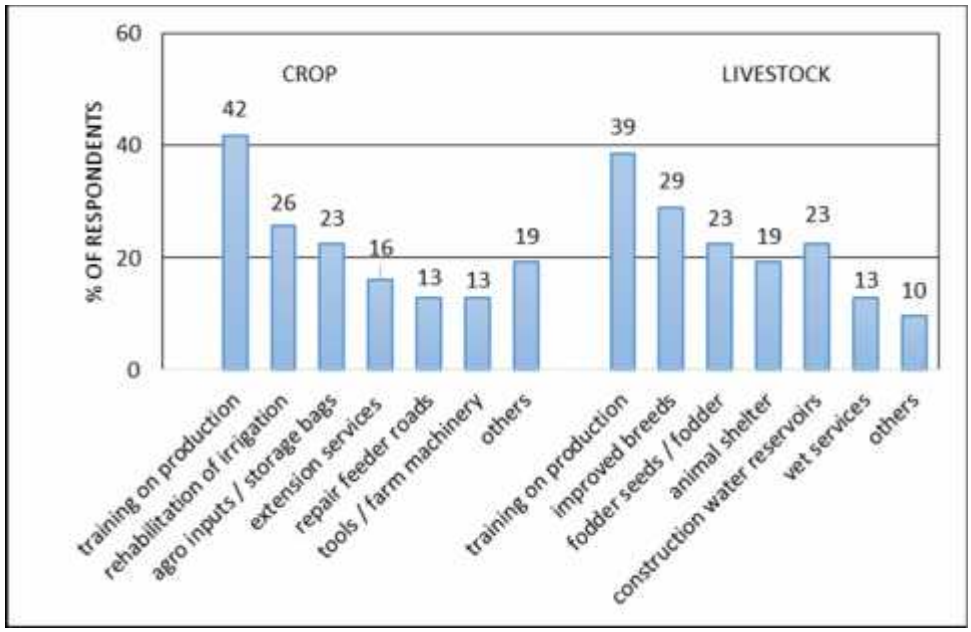
3.3.4. Medium term needs

Training on improved production technologies was mentioned as first priority for both the crop and livestock components. Whereas, rehabilitation of traditional irrigation schemes, followed by provision of agro-inputs and storage facilities (containers, bags, etc.) to re-activate crop production and reduce post-harvest losses, was mentioned by 26 and 23 percent

of respondents respectively (Figure 16). Others reported needs consisted in access to credits and markets, and resolution of agro pastoralist conflicts.

On the other hand, distribution of improved breeds of animal, especially cattle, was reported by 29 percent of respondents, followed by provision of fodder seeds and animal feed (23 percent). Construction of animal shelters and water reservoirs, was also indicated as an important medium term needs by 19 and 23 percent of respondents respectively. Others reported needs refer to management of pasture land and construction of milk collection centres (Figure 16).

Figure 16: Medium term crop and livestock needs

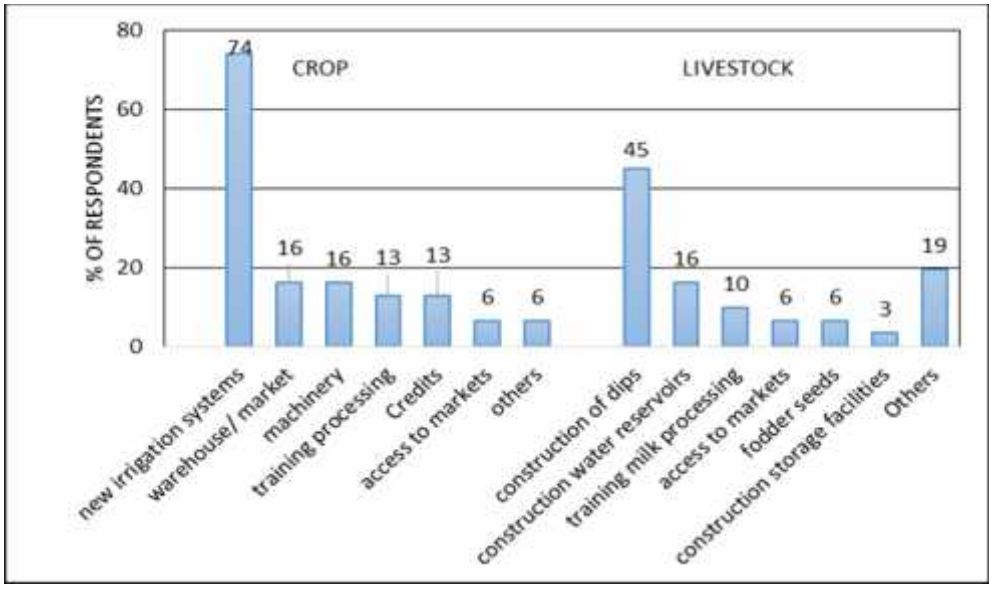


3.3.5. Long-term needs

Establishment of new irrigation schemes and construction of animal dips were the first priorities for the long term needs for 74 percent and 45 percent of the respondents respectively. In addition to enhance the storage of harvested crops and their marketability, construction of warehouses and linkages to market places were also indicated as key needs. Whereas, to increase crop production, provision of agricultural machineries, mainly tractors, and access to credit were also reported as long-term needs. Other requests includes trees seeds for planting and biogas equipment.

In order to boost livestock production and reduce the transmission of animal diseases, 45 percent of respondents indicated the need to construct dips, followed by construction of water reservoirs (16 percent), trainings on crops / animal products processing (10 percent), construction of storage facilities (3 percent) and others needs which include access to credit, formation of livestock keeper groups and provision of processing equipment (Figure 17).

Figure 17: Long term needs

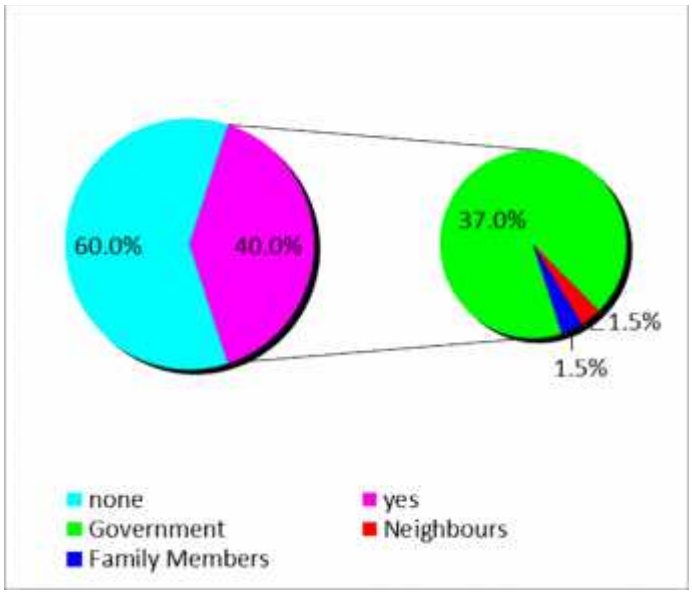


3.3.6. Assistance received

Across all the visited villages, only 10 percent of the communities have had received some food assistance before the floods, whereas at the time of the assessment, 40 percent of them have had received food assistance; mainly from the government but also from neighbours or family members, see Figure 18.

In addition to the food assistance, in 20 percent of the communities assessed some affected households had received tents, cash or clothing; either from the government, UNICEF or religious organisations. An overall absence of international and local NGOs working in emergency or development oriented activities has been observed.

Figure 18: Share of food assistance and origin



3.4. Recovery and rehabilitation interventions for rebuilding livelihoods

The following proposed interventions are directly linked to the floods' effects. Their implementation will help addressing the needs of the affected population in order to re-establish their livelihoods and rehabilitate the damages endured.

3.4.1. Short terms interventions (up to 6 months)

Short term intervention aims at quickly restoring the capacities of the affected population to produce food and income. This will avoid further deterioration of the food security / nutrition situation as well as guarantee the reduction of animal destocking and the depletion of additional productive assets. In this regards the main interventions should focus on:

- Provision of crops or vegetable seeds packages, especially fast growing and improved varieties, as well as hand tools to support the reactivation of the agricultural production.
- Restocking of poultry together with provision of vaccines against Newcastle disease and animal feed, mainly to women headed households.
- Distribution of fodder seeds for specific fodder production (i.e. alfalfa and green sorghum).
- Delivery of food assistance to the most affected households through in-kind, voucher or cash mechanisms.
- Establishment of Food or Cash for Work activities in order to rehabilitating local agricultural infrastructures, mainly roads and irrigation schemes.
- Provision of storage bags / bins to reduce post-harvest losses and enhance quality and conservation of food commodities.

3.4.2. Medium term interventions (up to 12 months)

Medium term interventions should be designed towards the enhancement of crops and livestock production in order to guarantee full recovery of those affected communities with the final aim of increasing their capacity to produce food and income. As such these interventions should focus on:

- Support the implementation of vaccination campaigns for bigger animals (cattle), especially against Rift Valley Fever and Foot and Mouth diseases.
- Establish community seed banks to ensure higher conservation and diminished losses.
- Improve the provision of extension and veterinary services and assist larger proportion of the population.
- Provide training sessions on improved crop production as well as marketing in order to increase crop diversification, adoption of short cycle and more resistant varieties, storage and transport of food commodities.
- Deliver trainings on animal production including introduction of improved cattle breeds, chicken rearing, as well as identification and control of animal disease.
- Provide training sessions on post-harvest processing techniques for both crops and animal products.

3.4.3. Long term interventions (up to 18 months)

Long term interventions requiring more time for their implementation should also be taken into account and specifically focus on:

- Construction of animal dips to facilitate veterinary treatment thus reducing the formation and spreading of animal diseases.

- Construction of metal silos for food and seeds storage to enhance their preservation and ensure some quality standards.
- Provision of improved breeds of cattle to enhance production of milk and meat.
- Provision of farm machineries and post-harvest processing equipment to increase production and income as well as reduce losses.
- Improve market linkages and accessibility through construction of roads, introduction of regulations for the transport of commodities, etc.
- Construction and rehabilitation of drainage systems and irrigation schemes as well as levelling of agricultural land to avoid water logging and allow the continuation of crop production and the enhancement of crop productivity.
- Promote a fully-fledged watershed management in order to reduce the associated risks of flooding of the agricultural land through - tree planting, land use management plans, riverbank maintenance, construction of dams, etc.

3.4.4. Development oriented interventions

In order to mitigate the effect of future similar disaster and ensure proper response to these events it is of imperative importance to:

- Establish a proper early warning system at all level (national, regional, district / municipality).
- Create awareness at community level on early warning and disaster risk reduction, management and mitigation.
- Develop an integrated and standardized methodology and guidelines to conduct post-disaster needs assessments with special emphasis on the agriculture sector, which is usually one of the most affected sector.
- Build the government capacity at central, regional and district / municipality level - targeting staff of the line ministries but also those from the Disaster Management Department - specifically on: disaster risk reduction and management, preparedness, post-disaster needs assessments and response planning.
- Establish a contingency fund in order to be able to implement needs assessments and response plans as well as quickly releasing emergency stocks which includes: food and seeds in addition to other relief items.

3.4.5. Prioritization for interventions

Based on the fieldwork exercise, the assessment team came out with a prioritization matrix based on the severity of the “El-Niño’s” effects in all visited locations (Table 9).

This ranking should be used for targeting purposes, thus helping the government and additional humanitarian actors to come out with effective response operations.

Table 9 Prioritization of locations to receive assistance

Region	District	Local Government Authority	Ward	Ranking*
Shinyanga	Shinyanga	Shinyanga MC	Mwamalili	3
		Shinyanga DC	Nyida	1
Mara	Serengeti	Serengeti DC	Kisaka	2
	Bunda	Bunda DC	Kisolya	2
Mwanza	Magu	Magu DC	Bujashi	1.4
	Sengerema	Sengerema DC	Katunguru	2.4
	Kwimba	Kwimba DC	Fukalo	1.2
Morogoro	Kilosa	Kilosa DC	Tindiga	1
	Mvomero	Mvomero DC	Sungaji	2
	Kilombero	Kilombero DC	Kivukoni	2.2
Arusha	Arumeru	Arumeru DC	Uwiro	1
	Longido	Longido DC	Noondoto	2
	Monduli	Monduli DC	Mswakini	1.2
Dodoma	Chamwino	Chamwino DC	Suri	1.7
	Dodoma	Dodoma MC	Mpunguzi	1.2
	Mpwapwa	Mpwapwa DC	Gulwe	1

*Ranking codes: 1= severely affected; 2= moderately affected; 3= lightly affected

Additionally, most urgent and specific interventions were identified for the different assessed regions based on the severity of the floods' impact. The number of potential beneficiaries for each of the visited region disaggregated by type of intervention are given in Table 10.

Table 10: Type of intervention and number of beneficiaries per type of intervention

Visited regions	Type of interventions and estimated numbers of potential beneficiaries					
	Vegetables & tools (HH)	Field crops & tools (HH)	Livestock vaccination (animals)	Cash for Work activities (HH)	Chicken package (HH)	Total beneficiaries
Mara	500	2000	3000		500	3000
Mwanza	3500	10000	4000	1000	1000	15500
Arusha	1500	2000			1000	4500
Shinyanga		3000	12000		500	3500
Dodoma	1000	2000	7000	750	500	4250
Morogoro	1500	2000		750		4250
Total beneficiaries	**8000**	**21000**	**3714**	**2500**	**3500**	**38714**
Animal vaccinated			**26000**		**245000**	**271000**

4. Projected Likely Scenario and conclusion

The "El-Niño's" event is expected to continue throughout the country, probably resulting in additional floods as indicated by weather forecasts from the Tanzanian Meteorological Agency (TMA), which might have further negative implications on crop and animal production while affecting the livelihoods of additional vulnerable people. These events are projected to occur during the period of March and April 2016, which are considered critical months for the development of key staple crops such as maize, rice, sorghum, millet, etc.

In addition to the damages and losses caused by the floods across the assessed regions, released crop estimates are showing that the ongoing maize harvest for the short agricultural season "*vuli*" in bi-modal rainfall areas, contributing usually to approximately 15 percent of the total annual cereal production, is expected to have a below-average production. The main reasons are attributed to the erratic rains registered in the country at the beginning of the agricultural season. [23]

Agricultural labour demand in the upcoming main agricultural season "*masika*" will continue to provide some income for the most poor and labour-dependent households, however it will not compensate the losses encountered during the short "*vuli*" season.

Overall, the food security situation in the country remains favourable in both bi-modal and uni-modal rainfalls areas. Despite this, some food insecurity continue to endure in the uni-modal Rift Valley regions of Dodoma and Singida, which experienced lower crop production during the last "*Msimu*" season (2015). Households in these areas are currently at Stressed (IPC Phase 2) food insecurity level.[24]

In addition, the findings of the assessments indicate that some areas affected by floods were currently in need of food assistance, due to the scarcity of food at household level resulting from the failure of their agricultural production in relation to the "*vuli*" season. This situation might even get worse if the effects of the "El-Niño" will continue as announced and anticipated, leading to an increase in food insecurity also towards other areas which are usually considered food secure.

Indeed, implication on the nutrition status of the affected people also need to be considered and further assessed since as demonstrated from the results of the assessment, many people have already engaged in negative copying mechanisms such as reducing number of meal per day or relying on less preferred food.

In conclusion, it is imperative to continue monitoring the agro-meteorological situation and conduct an in-depth crop, food security and nutrition assessment at the end of the current main agricultural season, in order to estimate the final implications of the "El-Niño's" effect on the livelihoods of the most vulnerable and affected population.

[23] http://www.fao.org/giews/countrybrief/country/TZA/pdf/TZA.pdf
[24] FAO GIEWS Country Brief 12th February 2016

5. Annexes

A) List of visited and assessed areas

Table 11: Location visited

Region	Local Government Authority	Ward	Village
Arusha	Meru DC	Uwiro	Uwiro
	Longido DC	Noondoto	Noondoto
	Monduli DC	Mswakini	Mswakini
		Mto wa Mbu	Migombani
Dodoma	Dodoma MC	Mpunguzi	Mpunguzi "B"
	Chamwino DC	Suri	Suri
	Mpwapwa DC	Gulwe	Gulwe
Mara	Serengheti DC	Kisaka	Buchanchari
			Nyansurumti
	Bunda DC	Kisolya	Masahunga
Morogoro	Kilosa DC	Tindiga	Tindiga "A"
	Mvomero DC	Mbogo	Mbogo
			Digoma
			Kwagole
	Kilombero DC	Kilombero ferry	Kilombero ferry
Mwanza	Serengerema DC	Katunguru	Chamabanda
	Kwimba DC	Fukalo	Nyang'honge
	Magu DC	Bujashi	Ihushi
Shinyanga	Shinyanga MC	Mwamalili	Mwamalili
	Shinyanga DC	Nyida	Igembya
	Kishapu DC		

B) Proposed project profiles

Appealing Agency:	**FOOD AND AGRICULTURE ORGANIZATION (FAO)**
Project title:	Distribution of vegetables seeds, hand tools and storage material to the most vulnerable households in "El Niño's" affected region.
Sector:	Agriculture
Overall Objective:	To support the promotion of vegetables production and reduction of post-harvest losses for the affected "El Niño's" vulnerable population.
Specific Objective:	- To enable affected households to cover part of their food needs with own vegetable production and generation of additional income. - To provide storage material to the affected households in order to diminish post-harvest losses and ensure better food conservation.
Expected Outputs:	- 12'000 number of affected households have received a package of vegetables seeds and hand tools. - 12'000 number of affected households have been provided with a set of storage containers or sealed storage bags.
Target Beneficiaries:	Female / child headed or most vulnerable farming households in Region Mara, Mwanza, Arusha, Dodoma, Morogoro, Kagera, Kigoma, Mbeya, Iringa and Manyara of Tanzania affected by "El Niño".
Stakeholders:	MALF, NGOs, FAO, district and local authorities.
Project Duration:	March - October 2016
Funds Requested	**US$ 321'000**

Summary

A good share of "El Niño" affected population will get a reduced production at the end of the 2015/16 season due to lower yields caused by floods or dry spells. As result, many people in the country will not be able to cover their basic food requirements. Considering that in many areas of the country farmers are able to cultivate vegetables also after the end of the rainy season, there is the potential to support their production by providing seeds and hand tolls (i.e. hoes). This will allow to alleviate the expected shortfall of own crop production and produce a marketable surplus to cover other basic needs expenditures. In addition, the provision of storage material such (containers / bags) will reduce post-harvest losses and ensure a better conservation of the already decimated crop harvest. The provision of vegetable seeds and hand tools should mainly target those affected communities having access to water for irrigation purposes (river / lake shore). Whereas the provision of storage material can target also other "El Niño's" affected vulnerable population, who were able to harvest some of their field crops.

Activities

FAO will distribute off-season vegetables seeds varieties, in addition to hand tools and storage material to most vulnerable "El Niño's" affected households, with the aim of supporting their food security and conservation, as well as enable generation of additional income. The inputs will vary according to the agro-ecological conditions of the targeted region and local preferences. Tools and storage materials will be procured nationally according to their availability in the market, and distributed following defined targeting criteria.

Financial Summary	
Budget items	**US$**
Staff (international, national and support)	50'000
Contract (implementation)	25'000
Travel costs, DSA, etc.	10'000
Inputs	308'000
Operational and administrative costs	12'000
Technical Support Service	7'650
Overhead	28'350
Total	**441'000**

Appealing Agency:	**FOOD AND AGRICULTURE ORGANIZATION (FAO)**
Project title:	Provision of high value crops and short cycle improved staple crops seeds and trainings to the most vulnerable households in "El Niño's" affected region of Tanzania.
Sector:	Agriculture
Overall Objective:	To support the diversification of crop production for the "El Niño's" affected most vulnerable farming population and enhance their household's resilience.
Specific Objective:	To enable the affected households to diversify their production and improve their agricultural techniques, through the promotion of high value crops (i.e. sesame and green gram) as well as improved short cycle staple crops, in addition to the provision of trainings.
Expected Outputs:	- 43'500 number of affected households have received improved field crop seed package. - 10'000 number of affected household attended trainings on crops diversification and management.
Target Beneficiaries:	Most vulnerable small scale farming households in all 13 region of Tanzania affected by "El Niño's".
Stakeholders:	MALF, NGOs, FAO, district and local authorities.
Project Duration:	June 2016 - February 2017
Funds Requested	**US$ 1'511'000**

Summary

Due to the effects of "El Niño" a good share of the rural farming population in the affected region of the country, will get either a reduced or no harvest from the crop cultivated during the 2015/16 agriculture season. As such, they will not be able to cover their food needs and most likely face different degrees of food insecurity later in the year. At the same time, farmers will store a reduced quantity or poor quality seeds for the next planting season (2016/17). In order to support the most vulnerable affected farming households in diversifying their production system and improving their resilience, FAO will promote the use of high value crops and short cycle staple food crops as well as provide training on crops diversification.

This will allow enhancing crop production for both own consumption and generation of income, as well as improving the capacity of the farmers to conduct efficient and sustainable agricultural production.

Activities

FAO will provide a package of the aforementioned seeds together with training programmes to selected farming vulnerable households, considered more affected by "El Niño". The final aim of the intervention is to ensure higher food security and improve farmer's production techniques. The selection of crop seeds will vary according to the agro-ecological zones of the targeted region and local preferences.

Financial Summary	
Budget items	**US$**
Staff (international, national and support)	70'000
Contract (implementation & training)	100'000
Travel costs, DSA, etc.	20'000
Inputs	1'158'000
Operational and administrative costs	50'000
Technical Support Service	15'140
Overhead	97'860
Total	**1'398'000**

Appealing Agency:	**FOOD AND AGRICULTURE ORGANIZATION (FAO)**
Project title:	Distribution of vaccines and restocking of poultry to affected households, who have lost their animals due to the effects of "El Niño" and other recurrent animal diseases.
Sector:	Agriculture / Livestock
Overall Objective:	To support the poultry production for the "El Niño's" affected most vulnerable population who have lost their animals in order to restock or maintain their flocks.
Specific Objective:	To enable the affected households to restock their flocks and reduce their mortality due to diseases (i.e. Newcastle) thus ensuring adequate animal protein production and intake (i.e. eggs and meat) as well as generation of income through selling of surplus.
Expected Outputs:	5'000 number of households have received support (both animals and vaccine) to restore and enhance their poultry production.
Target Beneficiaries:	Most vulnerable households, especially female headed, in the Region Mara, Mwanza, Arusha, Shinyanga, Dodoma, Kagera and Lindi of Tanzania who lost their animals due to the effects of "El Nino" in addition to other animal diseases.
Stakeholders:	MALF, NGOs, FAO, district and local authorities.
Project Duration:	March - December 2016
Funds Requested	**US$ 269'000**

Summary

A good share of the small scale poultry owning households in the "El Niño's" affected region have lost their poultry production, mainly chicken and ducks, due to heavy rains, hail incidences and floods. In addition to that, in the last years, poultry production has been drastically reduced in the country due to widespread outbreak of the Newcastle disease coupled with lack of vaccines. Production of animal products such as eggs and meat constitute an important and only source of protein for many vulnerable households in the rural areas. As such, it is important to guarantee the restocking of the poultry sector together with the provision of vaccine and trainings to avoid further losses and eventually boost this backyard animal keeping practice. FAO will improve beneficiaries' poultry keeping activities through provision of trainings which will mainly focus on improved production techniques and marketing.

Activities

FAO will provide a combination of poultry package and vaccines to the most affected households, especially those female headed, which have lost their animals. In addition, training on improved rearing practices and marketing will allow beneficiaries implement the acquired knowledge and increase their production for own consumption and generation additional income.

Financial Summary	
Budget items	**US$**
Staff (international, national and support)	30'000
Contracts (implementation and training)	25'000
Travel costs, DSA, etc.	10'000
Inputs	173'000
Operational and administrative costs	10'000
Technical Support Service	3'640
Overhead	17'360
Total	**269'000**

Appealing Agency:	**FOOD AND AGRICULTURE ORGANIZATION (FAO)**
Project title:	Implement Cash For Work (CFW) activities for the rehabilitation of affected local rural infrastructures (irrigation scheme and feeder roads) in "El Niño's" affected region.
Sector:	Agriculture / Livestock
Overall Objective:	To generate a temporary source of income for the most affected households, which mainly depended on agriculture casual labour, and rehabilitate at the same time the damaged local rural infrastructures.
Specific Objective:	Rehabilitate rural infrastructures in the most "El Niño's" affected region through CFW activities.
Expected Outputs:	4'500 most vulnerable households have benefited from CFW activities by repairing irrigation channels and feed roads.
Target Beneficiaries:	Most vulnerable and affected households, relying mainly on agriculture labour as a source of income in Region Mwanza, Dodoma, Morogoro, Lindi and Irnga of Tanzania.
Stakeholders:	MALF, FAO, NGOs', district and local authorities.
Project Duration:	March - December 2016
Funds Requested	**US$ 702'000**

Summary

Due to the effects of "El Niño's" event, a significant share of the agriculture land has been damaged or destroyed, and farmers will not be either in a need or a position to employ casual labourers to conduct agricultural activities (wedding, harvestings, etc.). At the same time different local rural infrastructures were damaged due to the floods, mainly traditional irrigation schemes (silted, filled with debris, canals interrupted) or rural feeder roads (potholes and sidewalk washed away). Hence, there is a need to ensure alternative income generating activities such as CFW, to provide a temporary income source for casual labourer and rehabilitate some of the damaged local rural infrastructures.

Activities

FAO will provide the required means and knowledge in order to set up a Cash For Work scheme envisaging the need to generate an alternative but temporary income source for the needy casual labourers through rehabilitation activities of damaged local rural infrastructures.

Financial Summary	
Budget items	**US$**
Staff (international, national and support)	80'000
Contract (implementation & supervision)	85'000
Travel costs, DSA, etc.	20'000
Inputs (cash allocation, rehabilitation material and tools)	450'000
Operational and administrative costs	12'000
Technical Support Service	9'710
Overhead	45'290
Total	**702'000**

Appealing Agency:	**FOOD AND AGRICULTURE ORGANIZATION (FAO)**
Project title:	Support the animal vaccination efforts of the government in order to strengthening the livestock affected directly or indirectly from the effects of "El Niño".
Sector:	Agriculture / Livestock
Overall Objective:	To support the livestock production in the "El Niño's" affected region, and improve the livestock health, through the implementation of a vaccination campaign.
Specific Objective:	Vaccinate large or small ruminants in order to protect them from recurrent diseases which treat their life and capacity of production in these areas affected by "El Niño".
Expected Outputs	At least 50'000 large ruminants have been vaccinated against the most common diseases.
Target Beneficiaries:	Most vulnerable livestock owning households in Region Mara, Mwanza, Shinyanga, Dodoma, Mbeya, Iringa of Tanzania whose animals are affected directly or indirectly by the effects of "El Niño".
Stakeholders:	MALF, FAO, district and local authorities.
Project Duration:	April - December 2016
Funds Requested	**US$ 866'000**

Summary

Due to the direct and indirect "El Niño's" effects, a significant proportion of grazing land and pastures have been lost or resulted in a poor quality reducing the fodder availability. In addition the stagnant water became the breeding grounds for mosquitos transmitting various diseases, especially the Rift Valley Fever. In order to strengthening the animal health and reduce the low productivity of local breeds as well as enhance their reproduction capacity, large and small ruminants will be vaccinated against various diseases. This vaccination campaign will strengthen the animal's health and ensure higher production of animal products (i.e. milk and meat), which will guarantee a diversified nutritional base for the affected households, in addition to the generation of additional income.

Activities

FAO will provide the required inputs for a vaccination campaign which will be implemented through the existing governmental structures.

Financial Summary	
Budget items	**US$**
Staff (international, national and support)	55'000
Contract (implementation)	120'000
Travel costs, DSA, etc.	25'000
Support to governmental structures	60'000
Inputs	513'000
Operational and administrative costs	25'000
Technical Support Service	12'140
Overhead	55'860
Total	**866'000**

C) Region specific dataset

Table 12: Frequency of natural hazards by region

Hazards	Arusha	Dodoma	Mara	Morogoro	Mwanza	Shinyanga
Flood	20.0	20.0	16.7	13.3	20.0	0.0
Drought	16.7	13.3	20.0	3.3	20.0	6.7
Pest/diseases	10.0	3.3	20.0	6.7	20.0	6.7
Storm	6.7	10.0	3.3	3.3	10.0	6.7
Hail	6.7	3.3	0.0	3.3	3.3	0.0
Frost	0.0	3.3	0.0	0.0	3.3	0.0

Table 13: Cultivated areas affected, destroyed and with reduced yield by region

region	Crop	maize	rice	sorghum	cassava	sorghum	groundnuts	vegetables	sesame	beans	sweetpotatoes	greengram
Arusha	area cultivated affected (%)	50.0					15.0	5.0		13.0	17.5	30.0
	destroyed (%)	35.0					100.0	60.0		100.0	100.0	0.0
	with reduced yield (%)	63.3					0.0	30.0		0.0	0.0	100.0
Dodoma	area cultivated affected (%)	31.7		35.0		70.0	12.5					
	destroyed (%)	68.3		50.0		72.5	2.5					
	with reduced yield (%)	6.7		18.3		25.0	65.0					
Mara	area cultivated affected (%)	53.4		18.3	50.0				12.5	20.0	25.0	
	destroyed (%)	94.2		100.0	100.0				100.0	100.0	100.0	
	with reduced yield (%)	5.8		0.0	0.0				0.0	0.0	0.0	
Morogoro	area cultivated affected (%)	55.0	87.5		10.0							
	destroyed (%)	60.0	51.3		100.0							
	with reduced yield (%)	15.0	46.3		0.0							
Mwanza	area cultivated affected (%)	44.5	18.5	10.0	21.0			14.0		22.5		21.7
	destroyed (%)	85.0	5.0	90.0	53.3			100.0		97.5		93.3
	with reduced yield (%)	15.0	95.0	10.0	26.7			0.0		2.5		6.7
Shinyanga	area cultivated affected (%)	10.0										
	destroyed (%)	2.5										
	with reduced yield (%)	12.5										

Table 14: Average yield reduction of the affected crops by region

Region	Arusha	Dodoma	Mara	Morogoro	Mwanza	Shinyanga
maize	68.3	37.5	90.0	100.0	40.0	25.0
Rice		100.0		27.5	10.0	
Sorghum	5.0	90.0	52.5			
Green gram	75.0		70.0			
Cassava			40.0		20.0	
Bulrush millet	70.0			5.0		
Beans						90.0
Groundnuts						60.0
Vegetables						100.0

Table 15: Animal ownership, percentage of death and sick animals by region

Region	Type of animal	cattle	goat	sheep	chicken	ducks	pigs
Arusha	owning houshold (%)	42.0	37.0	20.0	17.0	0.0	0.0
	death (%)	0.2	4.2	0.0	21.4	0.0	0.0
	sick (%)	0.0	0.0	0.0	0.0	0.0	0.0
Dodoma	owning houshold (%)	6.7	13.0	5.9	55.0	0.8	9.5
	death (%)	0.0	15.0	4.5	73.8	7.5	5.0
	sick (%)	0.0	8.3	0.0	1.7	0.0	0.0
Mara	owning houshold (%)	50.0	18.8	11.3	12.5	5.0	1.3
	death (%)	0.0	0.0	0.0	16.8	16.8	0.0
	sick (%)	0.0	0.0	0.0	0.0	0.0	0.0
Morogoro	owning houshold (%)	45.0	5.0	0.0	42.5	42.5	0.0
	death (%)	0.0	0.0	0.0	0.0	0.0	0.0
	sick (%)	0.0	0.0	0.0	0.0	0.0	0.0
Mwanza	owning houshold (%)	35.8	14.8	7.7	35.0	5.8	0.8
	death (%)	0.3	0.8	0.8	26.7	8.3	0.0
	sick (%)	0.8	2.0	1.7	0.8	0.0	0.0
Shinyanga	owning houshold (%)	38.0	20.0	15.0	12.0	5.0	10.0
	death (%)	0.0	0.0	0.0	0.0	0.0	0.0
	sick (%)	0.0	0.0	0.0	0.0	0.0	0.0

Table 16: Type of asset lost or damaged in percentage by region

Type of asset	Arusha	Dodoma	Mara	Morogoro	Mwanza	Shinyanga
Seeds lost (%)	43.3	88.3	49.2	76.3	45.8	25.0
Seeds damaged (%)	3.3	11.7	0.0	0.0	3.3	0.0
Fertilizer lost (%)	33.3	50.0	0.0	31.3	31.7	0.0
Fertilizer damaged (%)	0.0	0.0	0.0	0.0	0.0	0.0
Tools lost (%)	16.7	6.7	1.3	43.8	2.5	16.5
Tools damaged (%)	13.3	27.5	0.0	0.0	0.0	0.0
Agro machinery lost (%)	6.7	3.3	0.0	0.0	2.0	0.0
Agro machinery damaged (%)	5.7	13.3	0.0	0.0	0.0	0.0
Processing equipment lost (%)	0.0	1.7	0.0	0.0	0.0	0.0
Processing equipment damaged (%)	0.0	16.7	0.0	1.3	0.0	0.0

Table 17: Ranking of income source by region

Ranking of income sources	Arusha	Dodoma	Mara	Morogoro	Mwanza	Shinyanga
Crop production	2.8	3.0	2.8	3.0	3.0	3.0
Animal production	2.5	1.7	1.8	2.0	1.5	2.0
Fishing			1.0		1.0	
Selling natural resources	2.0					
Stones / brigs	1.0					
Daily labourer agriculture	1.0	1.3	1.0	1.0	1.5	1.0
Daily labourer non agriculture	1.0			2.0		
Petty trade	1.0		3.0	1.0	2.0	

(3=most important, 1=least important)

D) The assessment tools: Focus Group Discussions

FAO-Flood Agriculture & Livelihood Needs Assessment (Tanzania)

Focus Group Discussion (FGD) checklist: (Woman / Men)

Villages
Ward
District
Region:

N.B. Each FGD should comprise 12-15 persons mainly crop and fish farmers, livestock holders, fisherman and others involved in businesses related to agriculture/animal production and fishery. ***One FGD should be female and another FGD male.*** *Before starting FGD introduce the team members. Thanks the interviewee for their time. Explain the purpose of the assessment which is to obtain a realistic picture of the impact/effects of the flood on the agricultural sector and its sub-sectors including crop production, livestock, fisheries/aquaculture as well as irrigation in order to support the recovery process. Avoid raising expectations as far as possible.*

Impact/Effect on Crops

1. Which are the main disasters/hazards experienced by the community?

List of hazards	Yes/No	Recurrence	List of disaster	Yes/ No	Recurrence
Pest and disease			Flood		
Frost			Drought		
Hail			Storm		
Other (specify)			Other (specify)		

2. What are the main crops grown in the village?

Main crops grown in the village (list them)	Percentage (the sum of all crops should be 100%)	Indicate months of sowing	Indicate months of transplanting	Indicate months of wedding	Indicate months of harvesting

3. Which are the main affected crops by the flood?

Main affected crops by the flood (list them)	% of cultivated acre or ha under cultivation	% of acre or ha affected (expected loss of production)	% of acre or ha destroyed (no production)

4. In this affected areas how much will the production decrease (please indicate a percentage)?

Main affected crops by the flood (list them)	Percentage reduction of production

5. Are you expecting to have a reduce yield this year? If yes, why?

Reason:

6. Please indicate the price before and after flood and during same period last year?

Crops (list them)	Unit of measure (butter cup, pie, bags etc.)	Price before the flood (September/October 2015)	Price now (February 2016)	Price same time last year (February 2016)

7. How many people have access to irrigation in the community (indicate %)?

8. Were the irrigation system affected by the flood? If yes, which are the main problems experienced?

9. What is the average size of agricultural land owned by household?

Male headed:
Women headed:

10. Did the flood result in the loss and/or damage of seeds, fertilizers, pesticide, agricultural tools/machineries? If yes, please list the one which have been affected and indicates the proportion owned by the households.

Assets	% Lost	% Damaged
Seeds		
Fertilizers (manure)		
Hand tools (hand hoes and machetes)		
Agricultural machineries		
Processing machineries		
Household utensils		
Furniture		
Others (specify)		

11. Where any storage facilities (food or fertilizers) or animal shelters destroyed by the flood? If yes list them.

Infrastructures	% Lost	% Damaged
Seed store		
Fertilizers store		
Food store		
Machineries store		
Goat shelter		
Chicken shelter		
Others (specify)		

12. Which are the main constrains in regards to crop production?

13. What are the main needs to restore crop production (please fill the table below)? (i.e. Agricultural inputs, irrigation, tools/machineries, access to land, technical support form extension office,

infrastructure, trainings, etc.). Please do not list these options, allow respondent to give their opinion and at the end list the 5 main needs.

Main needs to restore crop production			
Priorities	**Short term (Feb-Jun 2016)**	**Medium term (Jun- Dec 2016)**	**Long term (>Dec 2016)**
1st			
2nd			
3rd			
4th			
5th			

Impact/effect on livestock:

14. Did people in this community lost animals due to the flood? If yes, please indicate below.

Animal lost (list Them)	**Percentage of animal owned before flood (the sum of all animal should be 100%)**	**% dead due to flood**	**% injured / sick due to flood**
Cow			
Goat			
Sheep			
Chicken			
Duck			
Other			

15. Can you please indicate the price of live animal?

Animal	**Price before the flood (September/October 2015)**	**Price now (February 2016)**	**Price same time last year (February 2015)**
Cow			
Goat			
Sheep			
Chicken			
Duck			
Others (specify)			

16. Do the people usually vaccine animals?
    Yes:
    No:

17. If yes, who provide the vaccine? Please tick the one that apply.

People buy it:
Government:
International organization:
Others (specify):
If no, why you don’t vaccine animals?

18. Which are the main constrains in livestock production?

19. What are the main needs to restore livestock production (please fill the table below)? (i.e. Animal restocking, provision of vaccine and vet services, water, shelter, feed, etc.). Please do not list these options, allow respondent to give their opinion and at the end list the 5 main needs.

Main needs to restore livestock production			
Priorities	**Short term (Feb-Jun 2016)**	**Medium term (Jun- Dec 2016)**	**Long term (>Dec 2016)**
1st			
2nd			
3rd			
4th			
5th			

Impact/effect on fishery and aquaculture

20. Which is the proportion (%) of people (men and women) involved in fisheries or aquaculture activities?

Fishery		**Aquaculture**	
Man	**Women**	**Man**	**Women**

21. Did the flood cause damaged or losses to equipment, tools, hatcheries, infrastructures, fish ponds, etc.? If yes indicate below.

List of equipment, infrastructure, etc.	**% totally destroyed**	**% damaged**
Nets		
Boats		
Hooks		
Hatchery(fish breeding areas)		
Other (specify)		

22. What is the average fish catch a day by different fish species (inland fishing)?

Fish species	**Production per season**	**Unit of season (day, season, etc.)**	**Duration of season**	**Price in the market (kg)**

23. What is the average production in fish ponds? (please indicate size of pond and amount of fish produced by fish species)

Fish species	**Measure of ponds**	**Amount produced per season**	**Duration of season**	**Price in the market (kg)**

24. Which are the main constrains to conduct in-land fishery and aquaculture production?

25. What are the main needs to restore fishery/aquaculture activities (please fill the table below)? (i.e. Provision of equipment, boats, fish, hatchery, etc. rehabilitation of fish pond, etc.). Please do not list these options, allow respondent to give their opinion and at the end list the 5 main needs.

Main needs to restore fishery / aquaculture production			
Priorities	**Short term (Feb-Jun 2016)**	**Medium term (Jun- Dec 2016)**	**Long term (>Dec 2016)**
1st			
2nd			
3rd			
4th			
5th			

Impact/effect on livelihoods and food security

26. What are the main sources of income for the households in this community? (Please tick the one that apply below).

Sources of income	**Importance**		
	1st	**2nd**	**3rd**
Selling of cash crop			
Sale of livestock or animal products			
Fishing			
Aquaculture			
Selling of firewood / grass/ other natural resources			
Sand stones mining / making brigs			
Employment			
Daily labour (agriculture)			
Daily labour (non-agriculture)			
Petty trade			
Other (specify)			

27. Do people usually engage in agricultural casual labour? If yes which period of the year, at which price and to do what? Please list below:

Casual labour activities	**Man %**	**Women %**	**Month**	**Price a day**
Weeding				
Harvesting				
Transplanting				
Other (specify)				

28. Did the people engaged in any negative coping mechanism since the flood? If yes, please list them below

List of copying mechanisms	Percentage of people
Rely on less preferred food (indicate which types)	
Reduce number of meal a day	
Borrowing money	
Purchase food on credit	
Begging	
Other (specify)	

29. Do you normally have access to market? If not which are the main limitation?
    Yes:
    No (explain main limitation):

30. Have you received any food assistance before and after the flood?

Before:
After:
If yes, from whom?

31. Have you received any other support after the flood? If yes, what and from whom?

Type of support received	From whom

32. What are the main needs to restore your livelihood and guarantee food security (i.e. access to credit, food assistance, employment opportunity, increase access to market, etc.)? Please fill the table below).

Main needs to restore livelihoods			
Priorities			
1st			
2nd			
3rd			
4th			
5th			

E) The assessment tools: Key Informant Interviews

Check list 2
FAO- Flood Agriculture & Livelihood Needs Assessment (Tanzania)

Name of Region:
Name of district:

Crop:

List crops cultivated before flood	Hectares cultivated	Yield per ha	Unit of measurement (bags, kg, tons, etc.)	Farm gate price (kg) before flood	List crop affected by flood	Hectares destroyed (yield=0%)	Hectares damaged (yield=reduced) indicate ha + % reduction of yield	Hectares not affected (yield=100%)	Farm gate price after flood (kg)

Additional comments:

Agricultural Inputs:

List the agriculture inputs (fertilizers, pesticides, etc.) used before the flood	Type	Quantity (Kg)	Price/kg before flood	List the agriculture inputs lost due the flood	Type	Quantity (Kg)	Replacement Cost after flood (kg)

Additional comments:

Livestock:

Type of Livestock	Number of animals before flood	Unit alive cost before flood	Type of product (milk, meat, etc.)	Price (kg, litre, etc.)	Number animals dead	Alive cost of replacement	Number animals injured	Unit treatment cost	Vaccine type	Unit Cost

Additional comments:

Animal feed:

Main feed used (type)	Price/kg	Feed lost due to flood (type)	Specify measure (kg, etc.)	Specify amount lost (kg)	Cost of replacement (kg)

Additional comments:

Fishery:

Number of people engaging in fishery	Type of equipment used	Quantity (number)	Unit cost before flood	Species of fish caught	Average catch per day	Selling price kg	Equipment lost	Quantity (number)	Unit cost for replacement	Equipment damaged	Quantity (number)	Repairing unit cost

Additional comments:

Aquaculture

Number of fish ponds	Size of ponds	Fish Specie farmed	Production per pond (kg)	Selling price of fish (Kg)	Number of ponds destroyed	Size of ponds	Fish Specie farmed	Reconstruction cost	Number of ponds damaged	Size of ponds	Fish Specie farmed	Rehabilitation cost

Additional comments:

Assets:

List of assets own before the flood (tools, machineries, etc.)	Quantity (number)	Unit cost before flood	List of assets entirely lost	Quantity (number)	Unit cost after flood	List of assets damaged requiring reparation	Quantity (number)	Unit Cost after flood

Additional comments:

Infrastructure:

List of storage and processing facilities (tools, inputs, food, etc.), as well as other animal and fishery related shelter, before the flood	Quantity (number)	Unit cost	List the facilities entirely lost	Quantity (number)	Replacement cost (after flood)	List the facilitates damaged requiring reparation	Quantity (number)	Cost for reparation (after flood)

Additional comments:

Irrigation:

Hectares of land under irrigation	Type of irrigation system	Cost per Hectares	Type of damage (pipe destroyed, channels blocked, sprinklers destroyed, etc.)	Hectares of irrigation land affected by flood	Cost for rehabilitation per Hectares

Additional comments