



Mid-Term Evaluation Report

For the
Conflict and Climatic Livestock Emergency Response Project (CCLERP)
Greater Upper Nile (Jonglei, Upper Nile and Unity States)
South Sudan

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List of Abbreviations and Acronyms

BHA	Bureau of Humanitarian Assistance
CAHWs	Community Animal Health Workers
CCLERP	Conflict and Climatic Emergency Livestock Response Program
CPA	Comprehensive Peace Agreement
FGD	Focussed Group Discussion
FMD	Foot and Mouth Disease
GUN	Greater Upper Nile States
IDPs	Internally Displaced Persons
IPC	Integrated Food Security Phase Classification
LERP V	Livestock Emergency Response Program V
NGOs	Non-Governmental Organizations
OFDA	Office of Foreign Disaster Assistance of the United States of America
PPR	Peste des petits ruminants
RVF	Rift Valley Fever
Shoats	Sheep and Goats
SSI	Semi structured interview
UNHCR	United Nations Humanitarian Commission for Refugee
USAID	United States Agency for International Development
VSF-G	Veterinaires Sans Frontieres Germany
VSF-S	Veterinaires Sans Frontieres Suisse

Executive Summary

Cattle and revenge related violence are a persistent problem in regions of South Sudan despite peace initiatives and cessation of armed conflict, establishment of The Ministry of Peace and Revitalized Agreement on Conflict Resolution in South Sudan. This is further complicated by the devastating effects of the 2019 floods that destroyed crops and submerged farmlands. It is estimated that following the floods, livestock mortality rates stood at 26% for cattle, 23% for sheep and goats and 9% for poultry populations. The flood waters persisted into February 2020 in most affected areas, further impacting negatively on livestock health, leading to continued losses and reduction in production. Livestock disease patterns, incidences, and effects changed with the floods and posed a significant threat to the livelihoods of livestock dependent populations of The Greater Upper Nile (GUN) with heightened public health risks as well as neglected tropical diseases such as Rabies, Rift Valley Fever (RVF), Brucellosis, Anthrax, Tuberculosis and Avian Influenza. This scenario called for interventions, hence the Conflict & Climate Livestock Emergency Response Program (CCLERP).

The CCLERP program set out activities that will be measured through indicators 1.1 that seeks to have 1,400,000 people benefit from livestock activities, 1.2 that will see 692,360 animals benefit from livestock activities, 1.3 that aims at each individual owning at least two animals, 1.4 that seeks to train 415 people in livestock management, 2.1 that seeks to have no veterinary facility being out of stock with requisite medical commodity tracer products, for longer than one week, 2.2 that sets out to treat or vaccinate 1,692,360 animals, 2.3 which hopes to have no animal disease outbreaks, 2.4 which targets to train 30 people in veterinary medical commodity supply chain management and 2.5 which seeks to have 60% of the beneficiaries reporting sustained or increased milk production.

The objectives of the mid-term evaluation were to (a) determine the appropriateness, relevance, efficiency, and effectiveness of the veterinary program, (b) assess the quality and comprehensiveness of the program design and implementation, (c) inform the implementation of the second phase (second year) of the program, (d) document lessons learned, success stories, case studies, and perceived and real as well as unmet needs and (e) generate baseline data and information for subsequent interventions.

The scope of the program targeted 1,400,000 individuals of which 343,686 were internally displaced (IDP's) and 1,056,314 host communities in (a) Jonglei State (Twic East, Duk, Ayod, Akobo, Nyiror, Fangak, Pibor, Pigi, Bor and Uror); (b) Unity State (Panyinjar, Leer, Koch, Mayendit, Rubkhona, Pariang, Abiemnhom, Mayom, Guit Counties); and (c) Upper Nile State (Ulang and Nassir Counties).

The evaluation used a mixed methods research design holding Focus Group Discussions (FGDs) with adult men and women as well as the youth in the Payams and In-Depth Interviews (IDIs) with Community Animal Health Workers (CAHWs), veterinary officers and program staff. The quantitative component fielded a standard questionnaire at household level (1,108 households) capturing the key components in the Terms of Reference for this evaluation. The evaluation covered eight Payams in four Counties selected in consultation with VSF CCLERP Program Staff. Fangak in Jonglei State, Rubkhona and Mayom in Unity State and Nassir in Upper Nile State were purposively sampled for accessibility reasons as well as to balance the implementation sites between the two VSFs (Germany and Suisse). The earlier random sample had Akobo and Nyiror in Jonglei, Leer in Unity and Nassir in Upper Nile. But accessibility and rains at the time of data collection in Nyiror for instance necessitated the purposive sampling. Of the 1,108 households, 753 (67.96%) were programme beneficiaries while 355 (32.04%) were not and were used for comparative

analysis. Four team leaders, one in each County were deployed to oversee the data collection teams in the eight Payams. The VSF-Germany country office managed transportation logistics.

The evaluation measured progress on the indicators using univariate (means, frequencies, percentages), bivariate statistics at the 5% significance level (pairwise comparison of means, standard error, t-statistic) and qualitative data. While only the univariate statistics are presented in this executive summary, statistically significant differences (reported in detail under section 4) exist between states, counties and payams on all indicators. The univariate statistics are now presented hereunder:

Indicator 1.1 Number of people benefiting from livestock activities: 1,400,000

The mid-term evaluation data suggests that up to 753 (67.96%) households had benefitted from livestock activities rolled out by VSF CCLERP programme. The number of people resident in these 753 households was 7,237 which is 68.86% of the total sample population of 10,510. Our sample suggests that up to 964,040 people could already be benefitting from livestock activities as of this evaluation, $(68.86/100)*1400000=964040$.

Indicator 1.2 Number of animals benefiting from livestock activities: 1,692,360

The mid-term data suggests that the number of animals benefitting from livestock activities from the 753 households are (a) 8,741 cattle, (b) 4,970 goats, (c) 2,614 sheep, (d) 42 donkeys, (e) 1,554 poultry, and (f) 49 other livestock, totalling to 17,970 out of a total household ownership of 37,913. Considering these 753 households only, we can estimate that 47.39%, $((17970/37913)*100)$, of the animals are benefitting from livestock activities. Extrapolating this to the target of 1,692,360, we can estimate that up to 802,009, $((47.39/100)*1692360)$, animals in the population (target areas) are benefitting from CCLERP's livestock activities.

Indicator 1.3 Number of animals owned per individual: 2

With 10,510 residents in the 1,108 households visited jointly owning 49,782 animals, an individual is estimated to be owning $(49,782/10,510) = 4.7366318$ rounded off to 4.74 animals. Broken down into the subgroups, an individual owns $(21,463/10510) = 2.04$ cattle, $(13,605/10510) = 1.29$ goats, $(7,247/10,510) = 0.69$ sheep, $(292/10,510) = 0.08$ donkeys, $(6,886/10510) = 0.66$ poultry, and $(289/10,510) = 0.08$ other livestock. We compare this overall ownership with that of the 753 households in the programme. With 7,237 residents in the 753 households, an individual is estimated to be owning $(37,913/7,247) = 5.2315441$ animals rounded off to 5.23 compared with 3.6263365 ($11868.999/3272.9999$) rounded off to 3.63 among non-programme households. By species, an individual in the 753 households owns 2.43 cattle, $(21,463/7,237)$, 1.44 goats $(10428.997/7247)$, 0.77 sheep $(5566.9998/7,237)$, 0.03 donkeys $(224.00003/7,237)$ 0.54 poultry, $(3905/7247)$ and 0.02 other livestock $(147.99997/7,237)$ compared with an individual in the non-programme households who owns 1.71 cattle, $(3822.9985/3,263)$, 0.97 goats $(3176/3,263)$, 0.51 sheep $(1679.9999/3,263)$, 0.02 donkeys $(68.000001/3,263)$, 0.91 poultry $(2981/3263)$, and 0.04 other livestock $(141/3263)$.

Indicator 1.4 Number of people trained in livestock: 415

The CCLERP biannual narrative report of March 2021 reported that 392 people (337 male and 55 female) had been trained in livestock activities. Data from the 753 households in the program suggests that up to 347 people have been trained in livestock as of the mid-term evaluation.

Indicator 2.1 Number of veterinary facilities out of stock of any of the veterinary medical commodity tracer products, for longer than one week: 0

The CCLERP programme dropped this indicator since it would be difficult to measure and instead provides emergency drugs to the Counties once a year as well as support the CAHWs with veterinary drugs. A recurring theme in the FGDs and IDIs pointed at drug shortages.

Indicator 2.2 Number of animals treated or vaccinated: 1,692,360

From our mid-term data, a total of 22,830 animals owned by the 753 households in the programme were treated or vaccinated for the period running up from August 2020. With these households' total livestock ownership of 37,913, the data suggest that more than 60.22% of the animals have been vaccinated or treated. Extrapolating this percentage to the target population of 1,692,360, we can estimate that up to 1,019,139 livestock could have been treated or vaccinated since August 2020 ($(60.22/100) * 1692360$).

Indicator 2.3 Number of animal disease outbreaks: 0

Data from the households suggest there were four disease outbreaks among cattle ($M=3.686823$), three among goats ($M=2.530686$), one among sheep ($M=1.491877$) and poultry ($M=1.094765$), zero (rounded off) among donkeys ($M=0.1001805$) and other livestock ($M=.0406137$). In-depth interviews with CAHWs corroborated these data.

Indicator 2.4 Number of people trained in veterinary medical commodity supply chain management: 30

Mid-term evaluation data from the 753 households in the program indicates that up to 643 people had been trained since August 2020. Upper Nile's mean of 1.406015 is the highest compared with Unity's 0.6675063 and Jonglei's 0.0444444. The differences between these means are statistically significant with 1.361571 ($t=8.04$, $p<.001$) between Upper Nile and Jonglei being the largest suggesting that more people were trained in veterinary medical commodity supply chain management in Upper Nile than in Jonglei for instance.

Other Indicators and Themes

(a) Proportion of beneficiaries reporting sustained/increased milk production: 60%

A total of 6,803 litres of milk were realized on the morning of the interview with 4,834.5 (71.06%) from cows and 1,968.5 (28.94%) from goats. We then asked the households to compare what they milked that morning with what they got about 30 days ago. Table 7 presents their response.

Table 7. Cattle milk litres 30 days ago

	Freq.	Percent	Cum.
1=More cattle milk than 30 days ago	581	52.44	52.44
2=Less cattle milk than 30 days ago	387	34.93	87.36
3=Same as 30 days ago	140	12.64	100
Total	1,108	100	

Note. Freq.=Frequency; Cum.=Cumulative

Up to 721 (65.08%) households indicated that what they milked on the morning of the interview was same or more compared with what they had milked about 30 days ago. Table 5 presents the rates for goat milk which suggest a decline with 642 (57.94%) households reporting they realized less goat milk on the morning of the interview compared with about 30 days ago. The difference, 466 (42.06%) households reported increased or similar milk compared with the rate 30 days ago. Up to 1,538 litres out of 4,834.5 milked from cows on the morning of interview were sold, translating to 31.81%. From goats, 1,108 litres were sold translating to 56.29%. Overall, 65.08% (52.44+12.64) of the households reported sustained or increased milk production since August 2020. This percentage meets in full the target of 60%. More milk was realized from the 753 households in the CCLERP programme (Mean = 7.187915 litres) compared with that from 355 households not in the programme (Mean = 4.105634 litres). The contrast is significantly different, statistically (3.082281, $t=7.88$, $p<.001$).

(b) Training of CAHWs

The mid-term evaluation data from the 753 households in the program suggests that up to 540 people had been trained as CAHWs. An IDI in Kuerengeke indicated that "...VSFG has trained 4 CAHWs in the Payam, and one refresher training was done..." (IDI1, CAHW, Nassir). Of the 540 people trained as CAHWs, 180 (33.33%) were female.

(c) Livestock Slaughtered for Household Consumption

Almost one third of the households (325) reported having slaughtered 533 cattle for household consumption or for celebrations, and functions since August 2020. This is compared with 1,073 goats (489 households), 494 sheep (261 households), and 1489 poultry (339 households) over the same period.

(d) Livestock Sales and Expenditure

Households reported selling livestock for the period since August 2020. The households sold 1,658 cattle and got SSP 98,296,939, 1,440 goats (SSP 13,281,130), 771 sheep (SSP 5,759,540), 26 donkeys (SSP 507,000), and 1,108 poultry (SSP 1,303,390). Table 8 presents the expenditure items after the sales. Expenditure on school fees and food appear to be the main expenditure items. Surprisingly, re-investment into livestock well-being such as purchase of veterinary items appears to have received less attention.

(e) Organizations that help with Livestock Production Services

Out of the 1,108 households, 805 (72.65%) mentioned VSF as the organization they know that helps with livestock production services in their respective Payam.

(f) Public Health Awareness Campaigns by VSF's CCLERP Programme

The 1,108 households reported up to 1,476 public health awareness campaigns by VSF's CCLERP programme since August 2020.

(g) Messaging on Appropriate Nutrition

More than half of the households, 634, 57.22%, reported having received messaging on appropriate nutrition from VSF's CCLERP programme with the remainder saying they had not.

(h) Livestock Losses to Adverse Climatic Conditions, Rustling and Disease

Most households (937, 84.57%) reported experiencing adverse climatic conditions for the period between August 2020 and the interview date that caused livestock deaths. These households reported losing 5,313 cattle, 3,755 goats, 2,144 sheep, 92 donkeys, 1,549 poultry and 41 other livestock. A total of 12,894 livestock were lost to climatic conditions of which 41.21% were cattle and 45.75% shoats. The 1,108 households reported losing 1,964 cattle to cattle rustlers or thieves, 1,411 goats, 697 sheep, 54 donkeys, 878 poultry and 70 other livestock. On average, a household lost 1.77 cattle to rustlers or thieves over the reference period, 1.27 goats, 0.63 sheep, 0.05 donkeys, 0.79 poultry and 0.06 other livestock. Livestock diseases also claimed some livestock from the 1,108 households. The data suggest that 5,352 cattle were lost to these diseases, 3,623 goats, 2,235 sheep, 68 donkeys, 1,592 poultry and 16 other livestock. Up to 12,886 livestock were lost to diseases between August 2020 and the interview date. On average, a household lost 4.83 cattle to diseases over the reference period, 3.27 goats, 2.02 sheep, 0.06 donkeys, 1.44 poultry and 0.01 other livestock.

(i) Youth/ Gender/ Women Empowerment

As of March 2021, the CCLERP narrative report indicates that 97 female CAHWs were trained in Akobo, Ayod, Bor South, Duk, Juba, Nyirol, Pibor, Panyinjar, Koch, Leer, Mayiendit, Abiemnhom and Ulang specifically to target livestock of vulnerable female headed households in the program locations. This should benefit small ruminants and chicken which are mainly kept by the female households in the community. About 539,029 livestock were protected through the vaccination of 246,910 sheep/ goats and 305 chicken as well as treatment of 289,878 goats/ sheep and 1936 chicken in the program locations which are mainly benefitting the female headed households and women who are the main owners of the small ruminants and chicken in the community.

(j) Nutrition

Respondent voices on nutrition from FGDs with women are mixed.

“...There are cattle at home, but I am not able to process ghee, cream or butter, because the amount of milk has reduced lately, the few litres we milk is consumed as sour milk or fresh milk straight away, ghee and butter is processed only if there is plenty milk, but because cattle are not able to go far for grazing, because of insecurity, the milk produced is little, it only cater for the family...” (FGD, Women, Ding Ding).

“...Last year, I was able to processed ghee and cream, I even sold some out, and I used money to buy some house stuff, but since the beginning of this year, there is a drop in milk, the little is now use only for house consumption which is still not enough even, this is because animals are all sick, goats have remain very few...there are no poultry now, this is because, chickens have died, you wake up in the morning when opening a chicken house you find sometimes about 5 chickens dead, I tried to clean

their house, but what I need now is pesticide, or powder to pour in the house to kill parasites like mites and lice...for livestock to produce more of their products, we need peace in this community, in other words, if government can disarm those civilians who are holding guns to raid cattle and kill the cattle keepers who are taking their animals for grazing.” (FGD, Women, Rubkhona).

(k) One Health/ Climate change adaptation & Public Health

By March 2021, four training sessions on gender and vulnerability, conflict mitigation, climate change and food hygiene had been conducted in Ulang and Rubkhona Counties for program beneficiaries. The trainings were attended by 68 participants (15 male & 53 female). The trainees acquired knowledge and skills on how to handle issues of protection and gender inclusion in the program and how to mitigate against conflict and climate change.

(l) Peace/ Conflict De-escalation

The CCLERP biannual narrative for March 2021 reports that up to 56 community dialogue and conflict mitigation meetings were conducted in Akobo, Ayod, Fangak, Juba, Nyirol, Pibor, Pigi, Ulang, Abiemnhom, Guit, Koch, Leer, Mayiendit, Mayom, Panyinjar and Rubkhona Counties and were attended by 1,357 participants (786 male & 571 female). As a result of the above meetings, the communities were able to map conflict spots, sharing of common resources, access to common grazing areas, formed conflict management committees that are to monitor and resolve common conflicts, livestock markets and peaceful co-existent. The conflict management committees are using traditional conflict resolution mechanism for returning raided cattle and abducted children.

Assessment Based on the Objectives and Performance of the Indicators

The voices of respondents in FGDs and IDIs were used to buttress quantitative data in addressing the objectives and performance indicators for this evaluation. Available evidence gathered in this mid-term evaluation suggests that the veterinary programme is appropriate, relevant, and effective. Its efficiency provides room for improvement especially in provision of livestock drugs. The programme is appropriate and relevant because it is addressing real needs in the community that deal with livestock diseases and vaccination. It is effective because the right drugs are being applied for dealing with the livestock diseases.

Available evidence from the quantitative and qualitative components of this evaluation also suggests that the CCLERP program is of good quality, is comprehensive, was designed well and is on course to achieving most, if not all outcomes it set out to accomplish. The results on the programme indicators support this assessment. Suggestions for consideration in the implementation of the second phase include, but are not limited to, (a) expanding the programme to other Payams not covered in the target areas, (b) employ more veterinary officers and CAHWs for enhanced effectiveness of treatment and vaccinations, (c) ensure adequate supply of drugs for treatment and vaccination, (d) supply working uniforms and T-shirts for project promotion as without these, CAHWs are held in suspicion in the community especially when there is animal theft, (e) consider carrying out vaccinations twice a year, probably every six months, (f) continue to find solutions to cattle rustling and theft, (g) make grazelands safe, especially in the forests where armed people harass pastoralists, (h) include or enhance the health and nutrition component of the programme and staff it appropriately.

Lessons learned, success stories, case studies, and perceived and real as well as unmet needs are aptly captured in the voices from FGDs and IDIs. For example,

“...There are many success cases in livestock management as I once was called at night to go and assist a cow with obstructed delivery, where I found the calf had died in the womb and based on skills, I managed to remove the calf using an instrument and my hand and the owner of that cow became happy and praised VSF-G...” (IDI, CAHW, Kuerengeke).

“...R3- what I witnessed that VSF has done and I benefited from it, not only me but this community of Dingding, is the vaccination of livestock and there are people (CAHWs) who opened small drug shops in market who said they were trained and given drugs by organization called VSF, which is very helpful to us now, we are able to call them to check or treat our livestock, what I am requesting from VSF is to train more people who will treat our animals, people who will be near our animals...” (FGD, Female, Ding Ding).

“...R1: The challenges usually faced in rearing livestock are many; during the rainy season, flooding happens and there is no place dry for the cattle to stay. This usually creates a lot of diseases and conditions to the cattle, and they die due to the scarcity of medicines that VSF-G provides. And in the dry season, there is also issue arising over the grazing land where many people compete for the green pasture and sometime this leads to fighting and someone may lose some of the cattle and even one can be injured or killed...Goats may not go far for grazing but end up eating papers, cartons, garbage and nylons, and these nylons are harmful to their health...I usually get milk from the cattle and goats, but sometimes when 2 to 3 of them deliver, then there will be more milk for the market. I DO NOT sell cows, except for serious issue of sickness, but the goat can be sold to buy sorghum and other family essentials. I produce ghee and sour milk whenever there is plenty of milk produced...This production can be improved when there is medicine provided for the animals, in addition to the shelters where they can sleep to avoid rain. Training about animal management and how to improve breeding is good...VSF-G do carry out vaccination campaigns and this is where I see animals get vaccinated and dewormed. Trainings are done prior to the vaccination activities but only few people are selected from the Payam and this is not done for other...(FGD, Female, Ding Ding)

This mid-term evaluation has put together a rich quantitative dataset from 1,108 households on 146 variables across three States, four Counties and eight Payams. This is augmented by 24 Focussed Group Discussions and In-Depth Interviews. These datasets have informed this mid-term evaluation and hold important statistics for subsequent programming and interventions.

1. Background to the Conflict & Climate Livestock Emergency Response Program (CCLERP)

Cattle and revenge related violence are a persistent problem in regions of South Sudan despite peace initiatives and cessation of armed conflict, establishment of The Ministry of Peace and Revitalized Agreement on Conflict Resolution in South Sudan. This is further complicated by the devastating effects of the 2019 floods that destroyed crops and submerged farmlands. It is estimated that following the floods, livestock mortality rates stood at 26% for cattle, 23% for sheep and goats and 9% for poultry populations. The flood waters persisted into February 2020 in most affected areas, further impacting negatively on livestock health leading to continued losses and reduction in production. Livestock disease patterns, incidences and effects changed with the floods and posed a significant threat to the livelihoods of livestock dependent populations of The Greater Upper Nile (GUN) with heightened public health risks as well as neglected tropical diseases such as Rabies, Rift Valley Fever (RVF), Brucellosis, Anthrax, Tuberculosis and Avian Influenza.

The crisis that kindled in December 2013 impacted negatively on the lives and livelihoods of populations of The Greater Upper Nile (GUN). This resulted in 968,000 internally displaced persons (IDPs) and 852,080 refugees in Sudan, 422,240 refugees in Ethiopia, 861,950 in Uganda, 121,414 in Kenya and 88,717 in the Democratic Republic of Congo. Unfortunately, the conflict had an overbearing gender dimension. For instance, of the 1.47 million internally displaced persons (IDPs) in the country, up to 80% of the households are female-headed and among the 2,216,652 refugees in neighbouring countries, 86% are women and children (The United Nations High Commission for Refugees). There has been a desire to return home among IDPs and refugees with 235,802 having returned from November 2017 to December 2019. About 85% have expressed their intention to stay permanently and 87% to settle in their former locations of residence. Uncertainty about security has been cited as a major reason for reluctance to return. Increasing livelihood challenges in Sudan and Ethiopia and the improving security context in South Sudan is likely to result in more returnees.

The resident population that stood the crisis suffered food insecurity of up to 47% with 10% under Integrated Food Security Phase Classification (IPC) level 4 emergency and 37% under IPC 3 crisis stage. Respectively, acute malnutrition levels continued above the World Health Organization (WHO) emergency threshold of 15% and The GUN remains the most affected region. Overall, the South Sudan Humanitarian Response Plan for 2020 estimated that 7.5m people needed humanitarian assistance. The plan targeted 5.6m people with a requisite budget of \$ 1.5 billion. The drawn-out conflict impacted negatively on the main livelihoods of the populations of The GUN, reducing cereal self-sufficiency from an average of 52% to 22%. The cereal deficit is made up from food aid 37%, market 34% and kinship support.

Despite significant losses of livestock through raiding, looting and theft, access to livestock has remained relatively high with livestock derived foods directly contributing 30% of household diet (milk and meat) and 50% of the sorghum sourced from the markets. Livestock derived foods, income from sale of products and livestock have played a key role in sustaining lives and nutrition of the conflict affected populations of The GUN when in refuge and in very hard to reach hideouts or during gaps in relief pipelines and health emergencies/crises. Income from livestock sales have also been invaluable in sustaining family members in refugee camps across the borders including access to education for children. That notwithstanding, refugees in the camps who have managed to acquire and rear livestock have reported improvement in their nutrition, diet, general livelihood, and resilience to shocks.

2. The CCLERP Program

2.1 Introduction

The Conflict and Climate Livestock Emergency Response Program (CCLERP) is a project implemented by Vétérinaires sans Frontières Germany (VSF-G) and Vétérinaires sans Frontières Suisse (VSF-S) and have been supporting pastoral livelihoods in South Sudan for over two decades working with communities in GUN among other regions/ states in the country.

Vétérinaires sans Frontières (Germany and Suisse) got funding from the U.S. Agency for International Development's Office of the Bureau for Humanitarian Assistance (USAID/BHA) to implement a two-year program. The program objective is to improve or sustain access to animal source food and related income for crisis-affected individuals at risk of malnutrition particularly children and women. The program is targeting people in The Greater Upper Nile, comprised of internally displaced persons (IDPs), host and returnee groups with support to local institutions and mechanisms for delivery of animal health and public health services while mainstreaming conflict sensitivity, protection, and Do No Harm approaches

2.2 The CCLERP Approach

The program designed to respond to protracted conflict, endemic livestock diseases and climatic extremes such as floods that undermine agro-pastoralists food security and livelihoods. The VSF Strategy recognizes that livestock are invaluable assets during emergency since they are able to move with people providing access to immediate food like milk, meat and blood, as well as other foods and essential family needs through cash from sale of livestock and products. The strategy aims to continue to support provision of emergency climate sensitive animal health services through CAHWs, support behavioural change for improved nutrition while empowering women and youth through livestock based initiatives and promotion of sustainable peace among conflict affected groups and populations. Together, livestock raiding, insecurity, livestock diseases and pests, and lack/ inadequate access to veterinary services and inputs, lack of access to markets coupled with climatic extremes (flooding) constitute key challenges in animal health and production. Additionally, emergencies among pastoralists have always heightened public health risks. To this end, The VSF (Germany and Suisse) will continue to provide public health education to the affected groups and populations. The outbreak of cholera in cattle camps in 2017 and confirmation of Rift Valley Fever in 2018 in addition to flood induced RVF risks in 2021 are cases in point; including escalating number of confirmed Covid-19 cases in the country. In this regard, the program will forge a functional cooperation with the departments of Public Health at County level and the Health Cluster at National Level.

2.3 The CCLERP Program Indicators

Indicator 1.1	Number of people benefiting from livestock activities: 1,400,000
Indicator 1.2	Number of animals benefiting from livestock activities: 1,692,360
Indicator 1.3	Number of animals owned per individual: 2
Indicator 1.4	Number of people trained in livestock: 415
Indicator 2.1	Number of veterinary facilities out of stock of any of the veterinary medical commodity tracer products, for longer than one week: 0
Indicator 2.2	Number of animals treated or vaccinated: 1,692,360
Indicator 2.3	Number of animal disease outbreaks: 0

Indicator 2.4 Number of people trained in veterinary medical commodity supply chain management:
30

2.4 The Objectives of the Mid-Term Evaluation

This Mid-Term evaluation set out to examine the program performance against the planned indicators and results, and specifically:

- a) To determine the appropriateness, relevance, efficiency, and effectiveness of the veterinary program.
- b) To assess the quality and comprehensiveness of the program design and implementation
- c) To inform the implementation of the second phase (second year) of the program
- d) To document lessons learned, success stories, case studies, and perceived and real as well as unmet needs
- e) Generate baseline data and information for subsequent interventions.

2.5 The Scope of the Mid-Term Evaluation

The evaluation targeted 1,400,000 individuals of which 343,686 were internally displaced (IDP's) and 1,056,314 host communities in (a) Jonglei State (Twic East, Duk, Ayod, Akobo, Nyiror, Fangak, Pibor, Pigi, Bor and Uror county); (b) Unity State (Panyinjar, Leer, Koch, Mayendit, Rubkhona, Pariang, Abiemnhom, Mayom, Guit Counties); and (c) Upper Nile State (Ulang and Nassir Counties). The evaluation covered eight Payams in four Counties selected in consultation with VSF CCLERP Program Staff. Fangak in Jonglei State, Rubkhona and Mayom in Unity State and Nassir in Upper Nile State were purposively sampled for accessibility reasons as well as to balance the implementation sites between the two VSFs (Suisse and Germany). The earlier random sample had Akobo and Nyiror in Jonglei, Leer in Unity and Nassir in Upper Nile. But accessibility and rains at the time of data collection in Nyiror for instance necessitated the purposive sampling.

3. Methodology

3.1 Introduction

We used a mixed methods research design for this evaluation. The qualitative component fielded Focus Group Discussions (FGDs) with adult men and women as well as the youth in the Payams as well as In-Depth Interviews (IDIs) with Community Animal Health Workers (CAHWs), veterinary officers and program staff. The quantitative component fielded a standard household questionnaire at household level capturing the key components in the Terms of Reference for this evaluation. The project proposal and the baseline evaluation report informed this mid-term evaluation.

3.2 The Quantitative Component

Since individual households are the owners of much of the livestock around which the main objective of the evaluation revolved (to improve or sustain access to animal source food and related income for crisis affected individuals at risk of malnutrition particularly children and women), we sampled 1,100 households in the three States (Jonglei, Unity and Upper Nile) using Probability Proportion to Size (PPS). This sample size was informed by a formula suggested by (Meier & Brudney, 1993¹) for calculating an effective sample size (Chuan, 2006²; Nachmias-Frankfort & Nachmias, 2008³; Welch & Comer, 1988⁴) as

$$n = \left(\frac{z \times \sigma}{E} \right)^2$$

Where;

n = the sample size;

z = z score associated with the desired confidence level (1.96 for 95%);

σ = the population standard deviation (0.5);

E = the percentage of error that the evaluation is willing to tolerate ($\pm 3\%$).

Substituting the figures into this formula, we got

$$n = \left(\frac{1.96 \times 0.5}{0.03} \right)^2 = (32.666667)^2 = 1067.1111$$

With a 95% confidence level for the results and a $\pm 3\%$ sampling error which is widely accepted in social science research (Welch & Comer, 1988), we rounded off this sample to 1,100 cases as recommended by

¹ Meier, K. J., & Brudney, J. L. (1993). Applied statistics for public administration (3rd ed.). Belmont, California: Wadsworth Publishing Company.

² Chuan, C. L. (2006). Sample size estimation using Krejcie and Morgan and Cohen statistical power analysis: A comparison. *Jurnal Penyelidikan IPBL*, 7, 78-86.

³ Nachmias-Frankfort, C., & Nachmias, D. (2008). Research methods in social sciences (7th ed.). New York, NY: Worth Publishers.

⁴ Welch, S., & Comer, J. (1988). Quantitative methods for public administration: Techniques and applications (2nd ed.). Pacific Grove, California: Brooks/Cole Publishing Company.

Israel (2009)⁵. A total of 1,108 households were visited and questionnaires administered. Table 1 breaks down the sample by State, County, and Payam.

Table 1. Sample Distribution

State	Households	County	Households	Payam	Households
1=Jonglei	283				
		11=Fangak	283	111=Manajang	149
				112=Phom	134
2=Unity	524				
		21=Rubkhona	244		
				211=Ding Ding	113
				212=Rubkhona	131
		22=Mayom	280		
				221=Routh Nyibol	142
				222=Riak	138
3=Upper Nile	301	31=Nassir	301		
				311=Jikmir	150
				312=Kuerengeke	151
Total	1,108		1,108		1,108

Of the 1,108 households, 753 (67.96%) were programme beneficiaries while 355 (32.04%) were not and were used for comparative analysis. Four team leaders, one in each County were deployed to oversee the data collection teams in the eight Payams. The VSF-Germany country office managed transportation logistics.

3.3 The Qualitative Component

Three Focus Group Discussions (FGDs) were held in each of the eight Payams, one for adult males, and another for adult females and the last for youth (mixed male and female). A maximum of seven participants were in each FGD. There is convergence in the literature suggesting that more than 80% of all themes are discoverable within two to three FGDs and 90% of themes could be discovered within three to six FGDs so long as these are relatively drawn from a homogeneous population⁶. Three In-Depth Interviews (IDIs) in each County were held with a Veterinary Doctor, a CAHW and a Public Health Officer. The VSF-G CCLERP Programme Officer was also interviewed for insights into the implementation of the Programme.

⁵ Israel, G. D. (2009). Determining sample size. Gainesville, FL: University of Florida.

⁶ Guest, G., Namey, E., & McKenna, K. (2017). How Many Focus Groups Are Enough? Building an Evidence Base for Nonprobability Sample Sizes. *Field Methods*, 29(1), 3-22. <https://doi.org/10.1177/1525822X16639015>

4. Results

4.1 Introduction

Data from the questionnaires were entered into a Microsoft Access database through an Epi Info (version 7.2.2.6) data entry screen before exporting the same into Stata version 15.1 for data cleaning, coding, and analysis. Our analysis used univariate and bivariate statistics which helped us generate means, frequencies, percentages etc. for comparison between groups (States, Counties, Payams and beneficiary/non beneficiary households). If these statistics were different between these groups on our outcome variables, then we moved to bivariate statistics for the statistical significance of the difference between the groups using pairwise comparison of means. We will pursue significant relationships with appropriate regression models to understand the drivers of those differences if there will be need.

Qualitative data analysis involved writing out transcripts for each FGD and KII before keying these into Nvivo version 12 software. Analysis was anchored on grounded theory by finding repeating themes, thoroughly reviewing the data, coding the emergent themes with keywords and phrases, grouping the codes into concepts hierarchically, and then categorizing the concepts through relationship identification. Finally, the categories created through this process, as well as the links found between them, were applied against the key questions and indicators of evaluation for triangulation with quantitative statistics. We have reported our results using standard tables disaggregated by the group variables mentioned.

4.2 Household Characteristics

Out of the 1,108 respondents, 468 (42.24%) and 640 (57.76%) were female and male respectively. The mean respondent age was 41.45 years with 21 as the minimum age and 80 as the maximum. Of these, 1,024 (92.42%) were household heads of which 414 (40.43%) and 640 (59.57) were female and male respectively. The mean female household composition was 4.79 with 3 households reporting 0 as the minimum and 2 reporting 21 as the maximum. This is compared with 4.70 for male occupants with 3 households reporting 0 (minimum) and 8 reporting 15 (maximum).

Up to 685 (61.82%) households reported having children who were out of school with 399 (58.25%) citing lack of fees as the main reason for this followed by 142 (20.73%) saying long distance to school was responsible. Household formal schooling completion rates were lower for household female members compared with males at primary, secondary and tertiary levels. Tables in Appendix B and C help us calculate the statistics. There were 10,510 residents in the 1,108 households visited with 5,305 (50.48%) of those being female, suggesting gender parity between females and males. The values in Appendix B were used in measuring our indicators such as livestock ownership at household level, among others while those in Appendix C were used in calculating school completion rates.

Only 1,138 (21.45%) females have completed primary school compared with 1,505 (28.91%) males. For females, we arrive at this figure as follows: $(1138/5305)*100=21.45146$ rounded off as 21.45%. For males, $(1505/5205)*100=28.914505$ rounded off as 28.91%. The completion rates at secondary school level are $(602/5305)*100=11.35\%$ and $(953/5205)*100=18.31\%$ for female and male household members respectively. This pattern persists and probably widens at tertiary level with female completion rate at $(253/5305)*100=4.77\%$ compared with $(486/5205)*100=9.34\%$.

4.3 Performance of the Indicators in the Mid-Term Evaluation

Indicator 1.1 Number of people benefiting from livestock activities: 1,400,000

As of March 2021, the CCLERP biannual narrative report indicated that up to 616,294 (320,473 male and 295,821 female) were benefitting from livestock activities.

The mid-term evaluation data suggests that up to 753 (67.96%) households had benefitted from livestock activities rolled out by VSF CCLERP programme. The number of people resident in these 753 households was 7,237 which is 68.86% of the total sample population of 10,510. Our sample suggests that up to 964,040 people could already be benefitting from livestock activities as of this evaluation, $(68.86/100) * 1400000 = 964040$.

We now answer the question of whether there is a significant difference between the mean estimates for beneficiaries per household across the three States, four Counties and eight Payams. The appropriate method for this is a pairwise comparison of means (pw mean) which performs pairwise comparisons (differences) of means, assuming a common variance among groups. It adjusts the p-values and confidence intervals for the differences to account for the elevated type I error rate due to multiple comparisons. Of the available adjustments for multiple comparisons, Tukey's honestly significant difference, Student-Newman-Keuls's method, and Duncan's method are most often used when performing all pairwise comparisons of means. Of these, Tukey's method is the most conservative and Duncan's method is the least conservative. We therefore used Tukey's method in our comparisons. We explored the effect of a nominal explanatory variable with more than two categories (States, Counties and Payams) on the outcome variable measured on the interval scale (number of people benefitting from livestock activities). Table 2 presents the mean number of residents in households who benefit from CCLERP's livestock activities across the three states.

Table 2. Household beneficiaries of CCLERP's livestock activities

States	Mean	Std. Err.	[95% Conf.	Interval]
1=Jonglei	9.97	0.23	9.51	10.42
2=Unity	9.30	0.17	8.97	9.64
3=Upper Nile	9.35	0.23	8.91	9.79

Note. CCLERP = Conflict & Climate Livestock Emergency Response Program; Std. Err. = Standard Error

Jonglei state appears to have a marginally higher mean number of residents in households who benefit from CCLERP's livestock activities compared with Unity and Upper Nile. We now run a pairwise comparison of these means to test whether the differences we see are statistically significant. Table 3. Presents the results.

Table 3. Household beneficiaries of CCLERP's livestock activities across the states

States	Contrast	Std. Err.	t	P> t	[95% Conf. Interval]
Unity vs Jonglei	-0.66	0.29	-2.3	0.056	-1.34 0.01
Upper Nile vs Jonglei	-0.62	0.32	-1.91	0.136	-1.38 0.14
Upper Nile vs Unity	0.05	0.28	0.16	0.986	-0.62 0.71

Note. CCLERP = Conflict & Climate Livestock Emergency Response Program; Std.Err. = Standard Error

The contrast in the row labelled (Unity vs Jonglei) is the difference in the mean number of residents in households who benefit from CCLERP's livestock activities between the two states. At a 5% significance level ($p < .05$), we conclude that there is no difference in the means for these two states ($p = .056$). The rest of the comparisons are equally not significantly different at the 5% significance level. From now hence, we will only report statistically significant results in our pairwise mean comparisons.

The -0.90 contrast between Mayom ($M = 9.064286$) and Fangak ($M = 9.968198$), ($9.064286 - 9.968198 = -0.9039122$), is statistically significant at the $p < .05$ level meaning that there are more household residents in households who benefit from CCLERP's livestock activities in Fangak compared with those in Mayom and that this difference is beyond chance, it is a real difference.

There are statistically significant differences between some of the eight Payams. Table 4 presents only statistically significant differences between those Payams with relation to the mean number of residents in households who benefit from CCLERP's livestock activities.

Table 4. Household beneficiaries of CCLERP's livestock activities across the payams

States	Contrast	Std. Err.	t	P> t	[95% Conf. Interval]
Kuerengeke vs Jikmir	-3.15	0.44	-7.16	<.001	-4.48 -1.81
Kuerengeke vs Rubkhona	-2.58	0.45	-5.69	<.001	-3.97 -1.20
Kuerengeke vs Manajang	-2.55	0.44	-5.79	<.001	-3.88 -1.21
Kuerengeke vs Phom	-1.79	0.45	-3.95	0.002	-3.16 -0.41
Ding Din vs Manajang	-1.67	0.48	-3.51	0.011	-3.11 -0.22

Note. CCLERP = Conflict & Climate Livestock Emergency Response Program; Std.Err. = Standard Error

The means between Kuerengeke ($M = 7.781457$) vs Jikmir ($M = 10.92667$), Kuerengeke ($M = 7.781457$) vs Rubkhona ($M = 10.36641$), Kuerengeke ($M = 7.781457$) vs Manajang ($M = 10.32886$), Kuerengeke ($M = 7.781457$) vs Phom ($M = 9.567164$), Ding Ding ($M = 8.663717$) vs Manajang ($M = 10.32886$) resulting in the contrasts in Table 6 are significantly different statistically.

Indicator 1.2 Number of animals benefiting from livestock activities: 1,692,360

As of March 2021, the CCLERP biannual narrative report indicated that up to 615,918 cattle were benefitting from livestock activities compared with 536,788 shoats, and 2,241 poultry.

The mid-term data suggests that the number of animals benefitting from livestock activities from the 753 households are (a) 8,741 cattle, (b) 4,970 goats, (c) 2,614 sheep, (d) 42 donkeys, (e) 1,554 poultry, and (f) 49 other livestock, totalling to 17,970 out of a total household ownership of 37,913. Considering these

753 households only, we can estimate that 47.39%, $((17970/37913)*100)$, of the animals are benefitting from livestock activities. Extrapolating this to the target of 1,692,360, we can estimate that up to 802,009, $((47.39/100)*1692360)$, animals in the population (target areas) are benefitting from CCLERP's livestock activities.

There appear to be substantial differences between the mean number of livestock per household that benefit from CCLERP's livestock activities across the three states: Jonglei (10.68551), Unity (16.75382) and Upper Nile (20.70764). These are aggregate values for all species and can easily mask individual species differences. Doing individual species analysis would lengthen the reporting under this section by six times. But individual species analysis can be done if there is need.

The contrasts from the pairwise comparison of means between the three states suggests that these are substantial with Upper Nile vs Unity's contrast of 3.953824 being statistically significant ($p=0.041$). The other two contrasts are also statistically significant: Unity vs Jonglei (6.068304, $p=0.001$) and Upper Nile vs Jonglei (10.02213, $p<.001$).

There are statistically significant differences at county level as well, given Fangak's mean of 10.68551, Rubkhona's 14.27869, Mayom's 18.91071 and Nassir's 20.70764. Pairwise comparison of their means suggests statistically significant differences between Nassir vs Rubkhona (6.428953, $p=0.005$), Mayom vs Fangak (8.225202, $p<.001$) and Nassir vs Fangak (10.02213, $p<.001$).

There are 16 out of the 28 pairwise comparisons at Payam level that are significantly different statistically. Table 5 presents these results.

Table 5. Number of animals per household benefiting from CCLERP's livestock activities across the payams

Payams, Means in parentheses ()	Contrast	Std. Err.	t	P> t	[95% Conf. Interval]
Phom (0.76) vs Manajang (19.61)	-18.85	2.57	-7.35	<.001	-26.64 -11.06
Kuerengeke (13.67) vs Jikmir (27.79)	-14.12	2.48	-5.68	<.001	-21.67 -6.58
Kuerengeke (13.67) vs Routh Nyibol (23.32)	-9.65	2.52	-3.83	0.003	-17.30 -2.00
Riak (14.38) vs Routh Nyibol (23.32)	-8.94	2.58	-3.47	0.013	-16.76 -1.12
Rubkhona (11.06) vs Manajang (19.61)	-8.55	2.58	-3.31	0.021	-16.39 -0.71
Jikmir (27.79) vs Manajang (19.61)	8.18	2.49	3.28	0.024	0.61 15.75
Jikmir (27.79) vs Ding Ding (18.01)	9.78	2.68	3.64	0.007	1.63 17.94
Rubkhona (11.06) vs Phom (0.76)	10.30	2.65	3.89	0.003	2.26 18.34
Routh Nyibol (23.32) vs Rubkhona (11.06)	12.26	2.61	4.69	<.001	4.33 20.19
Kuerengeke (13.67) vs Phom (0.76)	12.91	2.56	5.05	<.001	5.14 20.68
Jikmir (27.79) vs Riak (14.38)	13.42	2.54	5.28	<.001	5.70 21.14
Riak (14.38) vs Phom (0.76)	13.62	2.61	5.21	<.001	5.68 21.55
Jikmir (27.79) vs Rubkhona (11.06)	16.73	2.58	6.49	<.001	8.90 24.56
Ding Ding (18.01) vs Phom (0.76)	17.25	2.75	6.27	<.001	8.89 25.61
Routh Nyibol (23.32) vs Phom (0.76)	22.56	2.60	8.69	<.001	14.67 30.44
Jikmir (27.79) vs Phom (0.76)	27.03	2.56	10.6	<.001	19.25 34.81

Note. CCLERP = Conflict & Climate Livestock Emergency Response Program; Std.Err. = Standard Error

The largest contrast is between Jikmir and Phom suggesting that there are more animals per household in Jikmir that are benefitting from CCLERP's livestock activities compared with those in Phom and that this is a real difference that cannot be attributed to chance.

On average, the 753 households in the programme own 50.34927 animals compared with 33.4338 among non-programme households. The contrast of 16.91547 is statistically significant at the 5% level ($t=6.99$, $p<.001$).

Indicator 1.3 Number of animals owned per individual: 2

With 10,510 residents in the 1,108 households visited jointly owning 49,782 animals, an individual is estimated to be owning $(49,782/10,510) = 4.7366318$ rounded off to 4.74 animals. Broken down into the subgroups, an individual owns $(21,463/10,510) = 2.04$ cattle, $(13,605/10,510) = 1.29$ goats, $(7,247/10,510) = 0.69$ sheep, $(292/10,510) = 0.08$ donkeys, $(6,886/10,510) = 0.66$ poultry, and $(289/10,510) = 0.08$ other livestock.

We compare this overall ownership with that of the 753 households in the programme. With 7,237 residents in the 753 households, an individual is estimated to be owning $(37,913/7,247) = 5.2315441$ animals rounded off to 5.23 compared with 3.6263365 ($11868.999/3272.9999$) rounded off to 3.63 among non-programme households.

By species, an individual in the 753 households owns 2.43 cattle, $(21,463/7,237)$, 1.44 goats $(10428.997/7247)$, 0.77 sheep $(5566.9998/7,237)$, 0.03 donkeys $(224.00003/7,237)$ 0.54 poultry, $(3905/7247)$ and 0.02 other livestock $(147.99997/7,237)$ compared with an individual in the non-programme households who owns 1.71 cattle, $(3822.9985/3,263)$, 0.97 goats $(3176/3,263)$, 0.51 sheep $(1679.9999/3,263)$, 0.02 donkeys $(68.000001/3,263)$, 0.91 poultry $(2981/3263)$, and 0.04 other livestock $(141/3263)$.

We also asked the respondents about livestock ownership by female and youth members of the households. The data suggest that the female sample of 5,305 owned 2,305 cattle translating to $(2,305/5,305) = 0.43$ cattle per female. The numbers per female for the other species are $(2,598/5,305) = 0.49$ goats, $(1,470/5,305) = 0.28$ sheep, $(64/5,305) = 0.01$ donkeys, $(2,745/5,305) = 0.52$ poultry, and $(78/5,305) = 0.01$ other livestock.

We do not know how many youths make up that sample population of 10,510 and can therefore not work out individual statistics. Since we asked the respondents for livestock ownership by the youth, we worked out their percentage ownership of the different species. The data suggest they owned $(5,596/21,463)*100 = 26.07\%$ cattle, $(3,574/13,605)*100 = 26.27\%$ goats, $(1,604/7,247) = 22.13\%$ sheep, $(52/292)*100 = 17.81\%$ donkeys, $(2,276/6,886) = 33.05\%$ poultry, and $(45/289) = 15.57\%$ other livestock.

Individual ownership of livestock in households that in the CCLERP programme is more than that in households not in the programme. The means are 5.746232 and 4.144364 for individuals in programme households and for those not in the programme respectively. Pairwise comparison of these means returned a contrast of 1.601868 which is statistically significant ($t=3.95$, $p<.001$), meaning that this difference is not attributable to chance.

State wise, individuals in Jonglei owned 5.112423 livestock (mean of all species) compared with 5.853417 in Unity and 4.2663 in Upper Nile. It is however only the Upper Nile vs Unity pairwise mean comparison

that is statistically significant with a contrast of -1.587117, ($t=-3.48$, $p=0.002$) meaning that individuals in Unity own 1.587117 (rounded off to 2) more livestock than individuals Upper Nile.

There are three pairs of means that are significantly different statistically from one another at county level. Nassir's mean of 4.2663 is significantly different statistically from Mayom's 6.98022 yielding a contrast of -2.71392 ($t=-5.22$, $p<.001$). The other pairs are Mayom ($M=6.98022$) vs Fangak ($M=5.112423$) yielding a contrast of 1.867797 ($t=3.54$, $p=0.002$), Mayom ($M=6.98022$) vs Rubkhona ($M=4.560363$) with a contrast of 2.419857 ($t=4.41$, $p<.001$).

These differences continue into the Payams as well. Table 6 presents the results. The largest contrast is 4.51 between Routh Nyibol (7.69) and Rubkhona (3.18) suggesting that Routh Nyibol is the Payam with the highest and statistically significant individual livestock ownership rate.

Table 6. Individual livestock ownership across the payams

Payams, Means in parentheses ()	Contrast	Std. Err.	t	P> t	[95% Conf.	Interval]
Kuerengeke (3.90) vs Routh Nyibol (7.69)	-3.79	0.72	-5.24	<.001	-5.99	-1.59
Rubkhona (3.18) vs Manajang (6.33)	-3.15	0.74	-4.25	0.001	-5.40	-0.90
Jikmir (4.64) vs Routh Nyibol (7.69)	-3.05	0.72	-4.22	0.001	-5.25	-0.86
Rubkhona (3.18) vs Ding Ding (6.16)	-2.98	0.79	-3.76	0.004	-5.40	-0.57
Phom (3.76) vs Manajang (6.33)	-2.57	0.74	-3.49	0.012	-4.81	-0.34
Kuerengeke (3.90) vs Manajang (6.33)	-2.43	0.71	-3.4	0.016	-4.60	-0.26
Kuerengeke (3.90) vs Riak (6.25)	-2.35	0.73	-3.23	0.028	-4.56	-0.14
Kuerengeke (3.90) vs Ding Ding (6.16)	-2.26	0.77	-2.94	0.066	-4.60	0.07
Ding Ding (6.16) vs Phom (3.76)	2.40	0.79	3.04	0.049	0.01	4.80
Riak (6.25) vs Phom (3.76)	2.49	0.75	3.32	0.021	0.21	4.77
Riak (6.25) vs Rubkhona (3.18)	3.07	0.75	4.07	0.001	0.78	5.36
Routh Nyibol (7.69) vs Phom (3.76)	3.93	0.75	5.28	<.001	1.67	6.19
Routh Nyibol (7.69) vs Rubkhona (3.18)	4.51	0.75	6.02	<.001	2.24	6.79

Note. CCLERP = Conflict & Climate Livestock Emergency Response Program; Std.Err. = Standard Error

Indicator 1.4 Number of people trained in livestock: 415

The CCLERP biannual narrative report of March 2021 reported that 392 people (337 male and 55 female) had been trained in livestock activities. Data from the 753 households in the program suggests that up to 347 people have been trained in livestock as of the mid-term evaluation.

State wise, Upper Nile's mean of 1.289037 suggests it has more people trained in livestock compared with Unity's 0.6564885 and Jonglei's 0.0212014. All three pairwise mean comparisons are statistically significant: Upper Nile vs Unity (contrast=0.632548, $t=7.27$, $p<.001$); Unity vs Jonglei (contrast=0.6352871, $t=7.16$, $p<.001$) and Upper Nile vs Jonglei (contrast=1.267835, $t=12.75$, $p<.001$).

All the six pairs of means are significantly different statistically from one another at county level. The largest contrast (1.267835) is between Nassir ($M=1.289037$) and Fangak ($M=0.0212014$) and the smallest (-0.282377) is between Mayom ($M=0.525$) and Rubkhona ($M=0.807377$).

Nineteen of the 28 pairwise comparison of means at Payam level are statistically significant at the 5% level. The pair with largest the contrast (1.619866) is between Jikmir (M=1.64) and Manajang (M=0.0201342). The pair with the smallest contrast (-0.8862393) is between Rubkhona (M=0.3969466) and Ding Ding (M=1.283186). This means more people have been trained in Jikmir on livestock than say in Rubkhona, and that these numbers are real and no attributable to chance.

Indicator 2.1 Number of veterinary facilities out of stock of any of the veterinary medical commodity tracer products, for longer than one week: 0

The CCLERP programme dropped this indicator since it would be difficult to measure and instead provides emergency drugs to the Counties once a year as well as support the CAHWs with veterinary drugs. A recurring theme in the FGDs and IDIs pointed at drug shortages. The voice of a CAHW in Rubkhona captures this aptly.

“...One of the success is that I have done a lot in controlling animal diseases in this area, because of the training I received. The challenges I am facing is that sometimes, veterinary drugs are not available, and when the cattle owners come to my drug shop and ask me, and I tell them I don't have drugs, I really feel upset. The other challenge is moving far place to go get veterinary drugs, because my shop is far away from town... during training or after training, VSF gives us CAHWs Kite and support us with veterinary drugs for our drugs shops...” (IDI, CAHW, Rubkhona).

Indicator 2.2 Number of animals treated or vaccinated: 1,692,360

The March 2021 CCLERP narrative report indicated that 654,995 livestock (407,780 cattle and 246,910 sheep and goats and 305 chicken) had been protected through vaccination and 499,952 livestock (208138 cattle; 289878 sheep/goats; 1936 chicken) treated against common livestock diseases. The VSFs got livestock vaccines from Food and Agriculture Organization of the United Nations (FAO) for this program through an in-kind letter of agreement between the VSFs and FAO. Procurement of the Program veterinary pharmaceuticals was done and drugs sent to the field to support treatment intervention in the program locations. In Pibor County, VSF Germany did a joint livestock vaccination intervention with FAO as well as a joint livestock assessment in Gumuruk payam of Pibor with UNMISS.

From our mid-term data, a total of 22,830 animals owned by the 753 households in the programme were treated or vaccinated for the period running up from August 2020. With these households' total livestock ownership of 37,913, the data suggest that more than 60.22% of the animals have been vaccinated or treated. Extrapolating this percentage to the target population of 1,692,360, we can estimate that up to 1,019,139 livestock could have been treated or vaccinated since August 2020 ($(60.22/100)*1692360$).

We now present the vaccination rates disaggregated by animal species for the 753 households. Up to 65.65% of the cattle have been vaccinated ($(11580.997/17639.996)*100$), 60.14% of the goats ($(6271.9998/10428.997)*100$), 59.40% of the sheep ($(3306.9998/5566.9998)*100$), 33.04% of the donkeys ($(74.000021/224.00003)*100$), 39.56% of the poultry ($(1545.0001/3905)*100$), and 34.46% of other livestock ($(51.000012/147.99997)*100$).

There are differences at states level for the 1,108 households. The contrast (-10.4576) between Unity (M=18.5) and Jonglei (M=28.9576) is statistically significant as is 13.08472 between Upper Nile (M=31.58472) and Unity (M=18.5). The statistics suggest that Upper Nile has the most vaccinated livestock

compared with the other two states while Unity has the least. The contrast between Upper Nile and Jonglei is not statistically significant.

The difference at state level is replicated at county level with the two counties of Unity state having significant differences with Fangak in Jonglei and Upper Nile's Nassir.

There are 12 pairs of means at the Payam level whose contrasts are statistically different with the largest (28.58076, $p < .001$) being between Jikmir (M=43.68) and Rubkhona (M=15.09924) and the smallest (-15.78694, $p < .001$) being Routh Nyibol (M=25.53521) and Manajang (M=41.32215). This suggests that Jikmir has the highest number of livestock vaccinations compared with Rubkhona which has the least.

Indicator 2.3 Number of animal disease outbreaks: 0

Data from the households suggest there were four disease outbreaks among cattle (M=3.686823), three among goats (M=2.530686), one among sheep (M=1.491877) and poultry (M=1.094765), zero (rounded off) among donkeys (M=0.1001805) and other livestock (M=.0406137). In-depth interviews with CAHWs corroborated these data with some saying,

"...Since August 2020, Trypanosomiasis, Liver flukes, Brucellosis and FMD are the most disturbing diseases in this community of Mandeng Kurengke Payam...Most commonly diseases/ conditions are Liver flukes, Trypanosomiasis, Brucellosis, Black Quarter, Foot and Mouth disease, Snake bites etc. We are managing these diseases/ conditions with anthelmintics, trypanocides, antibiotics and the vaccines are just meant for prevention. But there is usually no drug for Brucellosis...Drugs and vaccines supplied are very few and end up consumed in the centre without reaching remote areas..." (IDI, CAHW, Nassir). "...CBPP, HS, Trypanosomiasis and foot rot, river fluke, internal parasites and skin diseases...are managed through ox tetracycline, tylosine and Ethidium and vaccination (IDI, Vet/CAHW, Fangak). "...Since the start of the vaccine, there is a delay in of drugs like Antibiotics, Antiprotozoal, and Helminthic since the start of 2021. There is only availability of vaccine but not enough to the livestock owners..." (IDI, Vet, Manajang).

"...We have diseases like foot and mouth, foot rot, Newcastle for poultry, mastitis, PPR, and the way we have managed them, is through vaccination that is offered by VSF... Normally we receive a package of drugs, from VSF-G after training, and when we have such drugs, the cattle owners always come for their animals to be treated, but these drugs are not always available, so the uptake of services is there but drugs are not available [enough]. The animal diseases that broke out since last year, 2020, screwworms, worms because of a lot of water (flooding)..." (IDI2, CAHW, Rubkhona).

"...R3- In my house, I have 10 chickens, last week about 3 were found dead, there is a disease that makes them drop watery drops, lowering their wings, I clean chicken house every day, but I think I need this organization to help me with some spray or powder to spray in chicken house, because the number of chicken is dropping, the remaining are only laying few eggs, we are not able to eat chicken or sell them in the market now, because they remain very few..." (FGD, Female, Ding Ding).

At 12.71429, Upper Nile's mean for disease outbreaks across all livestock species is the highest compared with Unity's 9.162214 and Jonglei's 4.533569. There are 11 pairs of means at Payam level whose contrast

are statistically significant at the 5% with the largest (16.59839) being that between Jikmir (M=20.84) and Manajang (M=4.241611) suggesting that Jikmir had a lot more livestock disease incidents compared with Manajang for the period running from August 2020 till the interview date.

Worryingly, more animals succumbed to diseases from the 753 households in the CCLERP programme (Mean = 13.62019) compared with those from 355 households not in the programme (Mean = 7.408451). The contrast is significantly different, statistically (6.211735, $t=5.92$, $p<.001$).

The March 2021 CCLERP narrative report indicated that only one cattle disease, East Coast Fever (ECF), had been reported in areas around Juba especially among the Jonglei cattle that were displaced by floods into the ECF zone. Most of these displaced livestock were not exposed to ECF before and this was the reason why there was this outbreak.

Indicator 2.4 Number of people trained in veterinary medical commodity supply chain management: 30

The CCLERP narrative report for March 2021 indicated that up to 434 people had been trained in veterinary medical commodity supply chain management (337 male and 97 female).

Mid-term evaluation data from the 753 households in the program reported that up to 643 people had been trained since August 2020. Upper Nile's mean of 1.406015 is the highest compared with Unity's 0.6675063 and Jonglei's 0.0444444. The differences between these means are statistically significant with 1.361571 ($t=8.04$, $p<.001$) between Upper Nile and Jonglei being the largest suggesting that more people were trained in veterinary medical commodity supply chain management in Upper Nile than in Jonglei for instance.

Other Indicators and Themes

(a) Proportion of beneficiaries reporting improved and or sustained access to animal source food and related income.

A total of 6,803 litres of milk were realized on the morning of the interview with 4,834.5 (71.06%) from cows and 1,968.5 (28.94%) from goats. We then asked the households to compare what they milked that morning with what they got about 30 days ago. Table 7 presents their response.

Table 7. Cattle milk litres 30 days ago

	Freq.	Percent	Cum.
1=More cattle milk than 30 days ago	581	52.44	52.44
2=Less cattle milk than 30 days ago	387	34.93	87.36
3=Same as 30 days ago	140	12.64	100
Total	1,108	100	

Note. Freq.=Frequency; Cum.=Cumulative

Up to 721 (65.08%) households indicated that what they milked on the morning of the interview was same or more compared with what they had milked about 30 days ago. Table 5 presents the rates for goat milk which suggest a decline with 642 (57.94%) households reporting they realized less goat milk on the morning of the interview compared with about 30 days ago. The difference, 466 (42.06%) households reported increased or similar milk compared with the rate 30 days ago. Up to 1,538 litres out of 4,834.5

milked from cows on the morning of interview were sold, translating to 31.81%. From goats, 1,108 litres were sold translating to 56.29%. Overall, 65.08% (52.44+12.64) of the households reported sustained or increased milk production since August 2020. This percentage meets in full the target of 60%.

More milk was realized from the 753 households in the CCLERP programme (Mean = 7.187915 litres) compared with that from 355 households not in the programme (Mean = 4.105634 litres). The contrast is significantly different, statistically (3.082281, $t=7.88$, $p<.001$).

The average litres of milk per household on the morning of the interviewer in Upper Nile were 6.96345 compared with 6.883588 in Unity and 4.123675 in Jonglei. The difference of 2.83978 between Upper Nile and Jonglei is the largest and is statistically significant ($t=5.60$, $p<.001$) just as is that between Unity and Jonglei (2.759913, $t=6.11$, $p<.001$). These statistics suggest that households in Upper Nile and Unity milked more litres than those in Jonglei.

At Payam level, households in Ding Ding milked more litres ($M= 9.362832$) compared with any of the other seven. Fourteen pairs of means at this level are statistically significant with the contrast of 5.342698 ($t=7.05$, $p<.001$) between Ding Ding and Manajang being the largest suggesting that more milk was realized by households in Ding Ding compared with those in Manajang.

“...Before this communal conflict started, our cattle used to produce a lot of milk both for consumption and commercial, but now they can hardly produce enough even for consumption, this is because the cattle just graze within the compound, they are not taken to the forest for grazing, because we fear they might be raided or even us the cattle owners might be killed...” (FGD, Men, Ding Ding)

“...R3- Most of the people around this payam, their lives depend on livestock and poultry for their products like beef, milk, eggs, however, because of this communal conflict, cows no longer produce enough milk, those days, one can find ghee cream in any cattle camp, but now, you can get only sour milk, and would have nothing to sell even...” (FGD, Men, Rubkhona).

“...R4- there are cattle at home, but I am not able to process ghee, cream or butter, because the amount of milk has reduced lately, the few litres we milk is consumed as sour milk or fresh milk straight away, ghee and butter is processed only if there is plenty milk, but because cattle are not able to go far for grazing, because of insecurity, the milk produced is little, it only caters for the family...” (FGD, Female, Ding Ding)

Of the 753 households in the programme, up to 504 (66.93%) had processed ghee since August 2020, 188 (24.97%) had processed cream, 255 (33.86%) had processed butter, and 350 (46.48%) had processed sour milk.

Up to 351 cattle out 20,127 (1.74%) owned by the 753 households for in Augusts 2020 were slaughtered for household food and during celebrations. Over the same period and for the same reasons, 680 goats out of 11,011 (6.18%), 366 sheep out of 7,302.9999 (5.01%), and 802 poultry out of 4,798 (16.72%) were slaughtered respectively.

The 753 households also reported income from livestock sales for the period from August 2020. Up to SSP 84,787,951 was realized from the sale of 1,292 cattle, SSP 10,657,631 from the sale of 1,081 goats, SSP

4,608,540 from the sale of 599 sheep, SSP 363,000 from the sale of six donkeys, and SSP 920,670 from the sale of 703 poultry.

Table 8 presents the expenditure items after the sales. Expenditure on school fees and food appear to be the main expenditure items. Surprisingly, re-investment into livestock well-being such as purchase of veterinary items appears to have received less attention.

Table 8. Expenditure Items from Sale of Livestock

Items	Cattle		Goats		Sheep		Donkeys		Poultry	
	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
1=On School Fees	161	31.51	119	33.24	64	31.07	ne	ne	25	17.12
2=On Food Purchases	242	47.36	116	32.40	39	18.93	ne	ne	20	13.70
3=On Household Shopping	58	11.35	67	18.72	46	22.33	1	25	37	25.34
4=On Medication	46	9.00	52	14.53	50	24.27	2	50	49	33.56
5=On Livestock	3	0.59	4	1.12	7	3.40	1	25	15	10.27
96=Other	1	0.20	ne	ne	ne	ne	ne	ne	ne	ne

Note. HHs=Households; ne=Not Expended

“...the livestock help the family with milk, butter and sour milk. They are used for paying dowries and during the hunger gap, one can be sold, and the money used for purchasing of household essential stuff...” (FGD, Female, Kuerengeke).

(b) Training of CAHWs

The CCLERP biannual narrative report for March 2021 reports that up to 392 CAHWs were trained (337 males & 55 females). The mid-term evaluation data from the 753 households in the program suggests that up to 540 people had been trained as CAHWs. An IDI in Kuerengeke indicated that “...VSFG has trained 4 CAHWs in the Payam, and one refresher training was done...” (IDI1, CAHW, Nassir). Of the 540 people trained as CAHWs, 180 (33.33%) were female.

“...As we attend training for CAHWs, we are also told how to live peacefully with the livestock owners and spread the message of peace, so when we are going for treatment or vaccination we first conduct a community dialogue, calling upon chiefs, leaders, women and give them peace message...” (IDI, CAHW, Rubkhona)

“...CAHWS were trained and then assigned to carry out their task and at least there was annual refresher training to inculcate new ideas to them in the project process...” (IDI, CCLERP Staff, Nassir)

(c) Organizations that help with Livestock Production Services

Out of the 1,108 households, 805 (72.65%) mentioned VSF as the organization they know that helps with livestock production services in their respective Payam. Table 9 presents the data.

Table 9. Name of Organization for livestock
Production Services

Organization	HHS	%	Cum%
1=ICRC	1	0.09	0.09
2=Nile Hope	1	0.09	0.18
3=VSF-G	383	34.57	34.75
4=VSF-S	127	11.46	46.21
5=VSF	295	26.62	72.83
6=WFP	1	0.09	72.92
96=Other unnamed	43	3.88	76.81
98=Don't know	257	23.19	100
Total	1,108	100	

Note. HHS=Households; Cum=Cumulative

Almost two thirds of the households (702, 63.36%) indicated livestock health as the dominant livestock production service followed by livestock marketing (95, 8.57%) and livestock production (39, 3.52%). The other services, fodder and feeds, meat products, milk products and hides and skins scored less than one percent except for the 257 (23.19%) households that indicated no knowledge of any organization offering livestock production services being.

(d) Public Health Awareness Campaigns by VSF's CCLERP Programme

The 1,108 households reported up to 1,476 public health awareness campaigns by VSF's CCLERP programme since August 2020.

(e) Messaging on Appropriate Nutrition

More than half of the households, 634, 57.22%, reported having received messaging on appropriate nutrition from VSF's CCLERP programme with the remainder saying they had not.

"...In nutrition program I don't like to talk on it because it does not exist but I encourage the VSF to introduce it to rescue our children that now are suffering with malnutrition...our extension officer trains about food hygiene but our communities are not taking it serious due to illiteracy because if you inform him/ her today then tomorrow will be opposite...because if hygiene practice is not, you could get more people affected with disease like diarrhoea. And those zoonotic infections need to be put in consideration because it is common here specially cattle keepers, so we need VSF-S to provide with the treatment for those disease...the zoonotic disease affecting our community are brucellosis, tuberculosis, anthrax and rabies from the dog and worms...We are continue to dialog with the community to avoid those practices to happen by following the hygienic method of food handling..." (IDI, Public Health Officer).

(f) Livestock Losses to Adverse Climatic Conditions, Rustling and Disease

Most households (937, 84.57%) reported experiencing adverse climatic conditions for the period between August 2020 and the interview date that caused livestock deaths. These households reported losing 5,313

cattle, 3,755 goats, 2,144 sheep, 92 donkeys, 1,549 poultry and 41 other livestock. A total of 12,894 livestock were lost to climatic conditions of which 41.21% were cattle and 45.75% shoats.

The 1,108 households reported losing 1,964 cattle to cattle rustlers or thieves, 1,411 goats, 697 sheep, 54 donkeys, 878 poultry and 70 other livestock. On average, a household lost 1.77 cattle to rustlers or thieves over the reference period, 1.27 goats, 0.63 sheep, 0.05 donkeys, 0.79 poultry and 0.06 other livestock.

Livestock diseases also claimed some livestock from the 1,108 households. The data suggest that 5,352 cattle were lost to these diseases, 3,623 goats, 2,235 sheep, 68 donkeys, 1,592 poultry and 16 other livestock. Up to 12,886 livestock were lost to diseases between August 2020 and the interview date. On average, a household lost 4.83 cattle diseases over the reference period, 3.27 goats, 2.02 sheep, 0.06 donkeys, 1.44 poultry and 0.01 other livestock.

“...with this communal conflict, [insecurity] we are moving from one place to another to look for peaceful place for us and our animals, and that affects the livestock, because the new place may not have enough pasture and water for these animals, which later reduce their production. Cattle raiders also are disturbing us in this area...” (FGD, Men, Ding Ding). “...-Diseases like FMD and Diarrhoea caused by worms...Predators, no enough pasture because everywhere is flooded...Luck of shelter for the cattle to be kept in...” (FGD, Men, Manajang).

“...R4- There are people in the forest who are carrying guns, when we take our cattle to forest for grazing they threaten, sometimes they (cattle raiders) start firing guns and take the cattle forcefully, when you resist, they will shot, cattle thefts also in the cattle camp at night, they come in the middle of night and steal cows, sheep and goats... R2- There are diseases like lambskin disease, foot and mouth, foot rot and Newcastle in poultry, all these diseases are attacking our animals and poultry but we are lacking veterinary drugs, the livestock were vaccinated only once since last year, we want this the same organization (VSF) to bring for us veterinary drugs to save our animals...” (FGD, Men, Rubkhona)

(g) Youth/ Gender/ Women Empowerment

As of March 2021, the CCLERP narrative report indicates that 97 female CAHWs were trained in Akobo, Ayod, Bor South, Duk, Juba, Nyirol, Pibor, Panyinjar, Koch, Leer, Mayiendit, Abiemnhom and Ulang specifically to target livestock of vulnerable female headed households in the program locations. This should benefit small ruminants and chicken which are mainly kept by the female households in the community. About 539,029 livestock were protected through the vaccination of 246,910 sheep/ goats and 305 chicken as well as treatment of 289,878 goats/ sheep and 1936 chicken in the program locations which are mainly benefitting the female headed households and women who are the main owners of the small ruminants and chicken in the community.

(h) Nutrition

Respondent voices on nutrition from FGDs with women are mixed.

“...There are cattle at home, but I am not able to process ghee, cream or butter, because the amount of milk has reduced lately, the few litres we milk is consumed as sour milk or fresh milk straight away, ghee and butter is processed only if there is plenty milk, but because cattle are not able to go far for grazing, because of insecurity, the milk produced is little, it only cater for the family...” (FGD, Women, Ding Ding).

“...I usually get milk from the cattle and goats, but sometimes no milk if the livestock don’t deliver off springs. I do not sell cows for food, except for serious issue of sickness, but the goat can be sold to buy sorghum and other family essentials with the consent of my husband or my elder son. I produce ghee and sour milk whenever there is plenty of milk produced...” (FGD, Women, Kuerengeke).

“...We have no enough food to feed our children so we asking any NGO to help this community...we have two type of problem livestock and human, now we have no enough food to feed our family and also lack of medicine to vaccinate our cattle so we need VSF to provide us with more drugs every 6 months...my household is gaining from the cattle by producing milk but some time it causes diarrhoea to our children meaning it is not hygienic milk so we need VSF to support women with training about food handling...we need VSF to provide us with plastic sheet and food to our family...some of the NGO coming here and do interview but no any outcome but we hope VSF can do more to the community so that our cows produce more milk...we also depend on fishing so we need VSF to introduces fishing material to the community to help us in food...if we have no food just provide us with plastic sheet to help our children...we need vaccination to our cattle so that they provide food and good meat” (FGD, Women, Riak).

“...Last year, I was able to processed ghee and cream, I even sold some out, and I used money to buy some house stuff, but since the beginning of this year, there is a drop in milk, the little is now use only for house consumption which is still not enough even, this is because animals are all sick, goats have remain very few...there are no poultry now, this is because, chickens have died, you wake up in the morning when opening a chicken house you find sometimes about 5 chickens dead, I tried to clean their house, but what I need now is pesticide, or powder to pour in the house to kill parasites like mites and lice...for livestock to produce more of their products, we need peace in this community, in other words, if government can disarm those civilians who are holding guns to raid cattle and kill the cattle keepers who are taking their animals for grazing.” (FGD, Women, Rubkhona).

(i) One Health/ Climate change adaptation & Public Health

By March 2021, four training sessions on gender and vulnerability, conflict mitigation, climate change and food hygiene had been conducted in Ulang and Rubkhona Counties for program beneficiaries. The trainings were attended by 68 participants (15 male & 53 female). The trainees acquired knowledge and skills on how to handle issues of protection and gender inclusion in the program and how to mitigate against conflict and climate change.

(j) Peace/ Conflict De-escalation

The CCLERP biannual narrative for March 2021 reports that up to 56 community dialogue and conflict mitigation meetings were conducted in Akobo, Ayod, Fangak, Juba, Nyirol, Pibor, Pigi, Ulang, Abiemnhom, Guit, Koch, Leer, Mayiendit, Mayom, Panyinjar and Rubkona Counties and were attended by 1,357 participants (786 male & 571 female). As a result of the above meetings, the communities were able to map conflict spots, sharing of common resources, access to common grazing areas, formed conflict management committees that are to monitor and resolve common conflicts, livestock markets and peaceful co-existent. The conflict management committees are using traditional conflict resolution mechanism for returning raided cattle and abducted children.

5. Assessment Based on the Objectives and Performance of the Indicators

5.1 Introduction

The voices of respondents in FGDs and IDIs were used to buttress quantitative data in assessing the objectives and performance indicators for this evaluation.

5.2 Determine the appropriateness, relevance, efficiency, and effectiveness of the veterinary program

Available evidence gathered in this mid-term evaluation suggests that the veterinary programme is appropriate, relevant, and effective. Its efficiency provides room for improvement especially in provision of livestock drugs. The programme is appropriate and relevant because it is addressing real needs in the community that deal with livestock diseases and vaccination. It is effective because the right drugs are being applied in dealing with the livestock diseases. The voices from the FGDs and IDIs buttress this assessment.

“...R6- VSF has trained some people (CAHWs) and gave [given] them some veterinary drugs to treat our animals, and these people have now opened drug shops near us, which made [makes] it very easier to access veterinary services unlike those days when we could move, footing from cattle camp to county headquarter...we also have experts on animal diseases, unlike those days where we just assume, go buy drugs and inject the cow, it is now the work of CAHWs who are trained by VSF to help community...” (FGD, Men, Rubkhona).

“...I consider the veterinary programme a success because the community now accepts their cattle to be vaccinated and treated and also most of the CAHWs get their capacity built through training and VSF-S has opened more centres for the vaccination and now almost all the payams has freezes...” (IDI, Public Health Officer)

“...VSF carried out massive vaccination in Rubkhona County and a lot of livestock benefited, during the vaccination campaign, they also held some community dialogue, spreading message of peace, and how we should live in harmony among ourselves...” (FGD, Men, Rubkhona).

“...The challenges usually faced in rearing livestock are many. During the rainy season, flooding happens and there is no place dry for the cattle to stay. This usually creates a lot of diseases and conditions to the cattle, and they die due to the scarcity of medicines VSFG provide. And in the dry season, there is also issue arising over the grazing land where many people compete for the green pasture and sometime this leads to fighting and someone may lose some of the cattle and even one can be injured or killed...VSFG do carry out vaccination campaigns and this is where I see animals get vaccinated and dewormed. Trainings are done prior to the vaccination activities but only few people are selected from the Payam and this is not done for other” (FGD, Men, Jikmir).

“...R1 our challenges here are bacterial infection and wounds by tick and also our cattle are dying we don't know the cause...R2 our livestock are dying due to flooding specially in this season and no vaccination now taking place VSF stop vaccination...R4 the challenge is when our cattle die we are advice not to eat and we see it as loss. So, we need the program to come back so that our family gets good food...R3 we have some challenges like cattle rustling as well as a lot of ticks, flu and other disease disturbing our cattle...R5 we cattle keepers must be aware of diseases killing our livestock and VSF to do more for vaccination improving...R3 VSF needs to bring vaccine and deworming...R4 training is important to know the type of disease you're treating...R2 we need VSF to put in practice all we say so that our cattle can be healthy...R7 small calves are dying due to flood and disease that make no production of milk to the house hold and some years back if the three cows can produce more milk but now due to climate change it not enough...R2 Now cattle are dying we are not eating because of infection...R5 if cattle are sick we cannot gain from them but if heathy, their contribution is a lot to the community by producing more milk...R6 if we vaccinate our livestock it contribute more but now we are in rain season and lack of vaccination...R4 we need the vaccination to continue more specially raining season to reduce the infection and also increase food like milk and meat...R6 if the previous team is not working well, we need VSF to train other so that the vaccination should be effective in all the location...R2 the cattle need to be vaccinated regularly...R7 the VSF need to know the timeframe for vaccination because June and July are more important...R1 we need VSF to introduce deworming and can be handle by train cattle keepers...R2 we need other drugs to be available for treatment so government need to monitor drugs in the country... (FGD, Men Routh Nyibol).

“...There are problems of cattle raiders and thieves from the neighbouring communities of Jonglei. Scarcity of drugs and medicines is another issue. Flooding and mud are really there and this affect our livestock...” (FGD, Female, Kuerengeke) “...R3 regular vaccination should be done to minimize the infection more specially rainy season...” (FGD, Youth, Riak)

“...R1- I don't know about this organization, but last year, there was a vaccination campaign done in Rubkhona County here by international organization, maybe it is VSF but I don't know the name, there are people now who opened animal drug shops in the markets, sometimes, we call them to treat our livestock...” (FGD, Youth, Rubkhona).

“...There is reduction of poultry mortality or death due to NCD vaccination for the first time in Fangak...” (IDI, CCLERP Staff, Nassir)

5.3 Assess the quality and comprehensiveness of the program design and implementation

Available evidence from the quantitative and qualitative components of this evaluation suggests that the CCLERP program is of good quality, is comprehensive, was designed well and is on course to achieving most, if not all outcomes it set out to accomplish.

Indicator 1.1 targets to have 1,400,000 people benefit from livestock activities. At mid-term, up to 7,237 (68.86%) of the total sample population of 10,510 were benefitting. Inferring this to the target population

suggests that up to 964,040 people could already be benefitting from livestock activities as of this evaluation, $(68.86/100) * 1400000 = 964040$.

Indicator 1.2 targets to have 1,692,360 animals benefit from livestock activities. Our results suggest that up to 17,970 out of a total household ownership of 37,913 (47.39%) from the 753 households. Extrapolating this to the target of 1,692,360, we can estimate that up to 802,009, $((47.39/100) * 1692360)$, animals in the population (target areas) are benefitting from CCLERP's livestock activities.

Indicator 1.3 targets that everyone owns two animals. The 10,510 residents in the 1,108 households visited jointly own 49,782 animals with an individual estimated to be 4.74 animals (2.04 cattle, 1.29 goats, 0.69 sheep, 0.08 donkeys, 0.66 poultry, and 0.08 other livestock). We compare this overall ownership with that of the 753 households in the programme. With 7,237 residents in the 753 households, an individual is estimated to be owning 5.2315441 animals rounded off to 5.23 compared with 3.6263365 $(11868.999/3272.9999)$ rounded off to 3.63 among non-programme households. By species, an individual in the 753 households owns 2.43 cattle, 1.44 goats, 0.77 sheep, 0.03 donkeys, 0.54 poultry, and 0.02 other livestock compared with an individual in the non-programme households who owns 1.71 cattle, 0.97 goats, 0.51 sheep, 0.02 donkeys, 0.91 poultry, and 0.04 other livestock.

Indicator 1.4 seeks to train 415 people in livestock. The CCLERP biannual narrative report of March 2021 reported that 392 people (337 male and 55 female) had been trained in livestock activities. Data from the 753 households in the program suggests that up to 347 people have been trained in livestock as of the mid-term evaluation..

Indicator 2.1 The CCLERP programme dropped this indicator since it would be difficult to measure and instead provides emergency drugs to the Counties once a year as well as support the CAHWs with veterinary drugs. A recurring theme in the FGDs and IDIs pointed at drug shortages.

Indicator 2.2 targets to treated or vaccinate 1,692,360 animals. Our mid-term data from the 753 households in the programme suggests that 22,830 (60.22%) animals were treated or vaccinated for the period running up from August 2020. Extrapolating this percentage to the target population of 1,692,360, we can estimate that up to 1,019,139 livestock could have been treated or vaccinated since August 2020 $((60.22/100) * 1692360)$.

Indicator 2.3 targets to have no animal disease outbreaks. The results suggest that there were four disease outbreaks among cattle (M=3.686823), three among goats (M=2.530686), one among sheep (M=1.491877) and poultry (M=1.094765), zero (rounded off) among donkeys (M=0.1001805) and other livestock (M=.0406137). In-depth interviews with CAHWs corroborated these data.

Indicator 2.4 targets to have 30 people trained in veterinary medical commodity supply chain management. The CCLERP narrative report for March 2021 indicated that up to 434 people had been trained in veterinary medical commodity supply chain management (337 male and 97 female). Our mid-term evaluation data from the 753 households in the program indicates that up to 643 people had been trained since August 2020.

5.4 Inform the implementation of the second phase (second year) of the program

The following are areas that data from the FGDs and IDIs suggest should be improved in the second phase of the programme.

“...Nasir county is so big with 15 Payams and I hope that donors should be flexible to accept expanding the project so as each Payam of Nasir county is reached and the livestock health services are improved...” (IDI, CCLERP Staff, Nassir).

“...Nasir is such a big county with 15 Payams and VSF-G is only operating in 3 Payams along the river Sobat corridor, and so Payams far from here are not covered in the project...VSF-G has employed few veterinary officers as such there is no effectiveness and efficiency in the implementation of the activities on animal health because of scarcity of CAHWs in other 9 Payams.....Drugs and vaccines supplied are very few and end up being consumed in the centre without reaching remote areas...Mading and Keikon Payams are larger ones than Kuerengeke and so need separate VSF-G bases there...Since 2016, VSF-G has not supplied any working uniforms and T-shirts for project promotion...VSF-G should plan to employ additional more CAHWs and especially for the other Payams...” (IDI, CAHW, Kuerengeke).

The Quantitative results have also pointed areas where the targets have not been met fully and that these should be areas of focus in the second phase. These results are not reported here to avoid repetition.

5.5 Document lessons learned, success stories, case studies, and perceived and real as well as unmet needs

The FGDs and IDIs shade some light on the lessons learned, success stories, case studies, and perceived and real as well as unmet needs.

“...There are many success cases in livestock management as I once was called at night to go and assist a cow with obstructed delivery, where I found the calf had died in the womb and based on skills, I managed to remove the calf using an instrument and my hand and the owner of that cow became happy and praised VSF-G...” (IDI, CAHW, Kuerengeke).

“...R3- what I witnessed that VSF has done and I benefited from it, not only me but this community of Dingding, is the vaccination of livestock and there are people (CAHWs) who opened small drug shops in market who said they were trained and given drugs by organization called VSF, which is very helpful to us now, we are able to call them to check or treat our livestock, what I am requesting from VSF is to train more people who will treat our animals, people who will be near our animals...” (FGD, Female, Ding Ding).

“...R1: The challenges usually faced in rearing livestock are many; during the rainy season, flooding happens and there is no place dry for the cattle to stay. This usually creates a lot of diseases and conditions to the cattle, and they die due to the scarcity of medicines that VSF-G provides. And in the dry season, there is also issue arising over the grazing land where many people compete for

the green pasture and sometime this leads to fighting and someone may lose some of the cattle and even one can be injured or killed...Goats may not go far for grazing but end up eating papers, cartons, garbage and nylons, and these nylons are harmful to their health...I usually get milk from the cattle and goats, but sometimes when 2 to 3 of them deliver, then there will be more milk for the market. I DO NOT sell cows, except for serious issue of sickness, but the goat can be sold to buy sorghum and other family essentials. I produce ghee and sour milk whenever there is plenty of milk produced...This production can be improved when there is medicine provided for the animals, in addition to the shelters where they can sleep to avoid rain. Training about animal management and how to improve breeding is good...VSF-G do carry out vaccination campaigns and this is where I see animals get vaccinated and dewormed. Trainings are done prior to the vaccination activities but only few people are selected from the Payam and this is not done for other...

“R2...The challenges I face in animals rearing especially the cattle is the issue of flooding happening throughout the Payam due to the downpour. When the land is swampy and the water is full, animals stay tied down at home and one must go get soft grass for the cattle to graze on. Due to lack of shelter, these cows are exposed to rainy, and they develop diseases and due to lack of medicine they die. There are so many mosquitoes and flies that keep biting the cows. Flu and wound in the mouths and feet disturb them...With the poultry, there are mite or small insects disturbing them and the family members and these insects are concentrating on the eyes of the chickens and chicks letting them to become blind and cannot find food for themselves and they die in big numbers. Hawk, falcons and wild cats are also dangerous during the dry seasons for the chickens and the chicks...I usually sell milk and the sour milk produced to buy flour and other food stuff. When someone is sick, one can sell a goat or a chicken and look for medicines. When an in-law come to the house, I usually slaughter one chicken for him/her is s/he is one, but when they are many, then I can send for one goat...I rarely sell or slaughter a cow, only when there is marriage ceremony or blood compensation...[animal health] can be improved when there is medicine provided to keep the cattle healthy. Training on cattle rearing and milking and how to produce ghee and sour milk is important. Poultry usually provide eggs and these eggs can be consumed by children and some can be sold to get money for other things. But the small insects are the challenge and even to family and this is why some family do not like them at home...VSF-G is the only organization providing medicine and conducting campaign on animals' issue, but only small portion of drugs come and cannot reach all people owning animals. I have never seen any medicine for the poultry provided by VSF-G in this Payam.....” (FGD, Men, Jikmir). Respondent 4-7 raised similar themes and are not reported to avoid repetition.

“R3...One of the challenge is that we don't have enough boreholes around here, we only have one borehole and this is what we are using to get water for drinking, cooking, washing and it is the same borehole used by livestock to drink, so there is water shortage in this area, which makes it the main challenge we are facing here, with the return of some people from POCs, there are a lot of people in one area using only one borehole and sharing it with animals.

“R5...Since the conflict erupted, we have never stayed calm with our livestock, we move to peaceful place, for a while and again we are displaced, when we take our cattle for grazing, the cattle raiders come with guns and threaten to take cows if you resist you are shot and cows taken, now we don’t take our cattle to the forest, they just graze near the houses where they can be seen. There is also a new disease affecting sheep, they move in cycle and later maybe in the evening dies, poultry in the other hand, are found dead in the morning...” (FGD, Female, Ding Ding)

5.6 Generate baseline data and information for subsequent interventions.

We put together a rich quantitative dataset from 1,108 households on 146 variables across three States, four Counties and eight Payams. This is augmented by 24 Focussed Group Discussions and In-Depth Interviews. These datasets have informed this mid-term evaluation and hold important statistics for subsequent programming and interventions.

6. Recommendations

Some recommendations have already been captured under sub-sections 5.1-5.5 and will not be repeated here for avoidance of repetition. The respondents, who are the stakeholders, recommended the following:

[6.1] R2 "...The only solution to the challenges we mentioned is for international organizations like VSF to help us with veterinary drugs,

[6.2] "...and am also asking them that, they should carryout vaccination twice a year, maybe at the beginning of the year and the end of the year [*meant every six months*], to prevent animals from being attacked by diseases, other organizations should also help distribute for us raincoat, tents.

[6.3] R7...Government also has to make sure these cattle rustlers who are carrying guns in the bushes, and killing innocent people should be capture and taken to jail to pay for their sins, guns in the hands of civilians is not also good, for us the cattle keepers to stay peaceful and move freely to take our cattle to grazing sides, government of this State must disarm all those who are carrying guns..." (FGD, Men, Rubkhona)

[6.4] "...According to myself I recommend the project to continue helping our community with vaccination and treatment also,

[6.5] ...to include health and nutrition to the program by recruiting public health officer to hand any outbreak among the cattle keepers.

[6.6] ...the CCLERP project needs to focus mostly on training and to introduce twice vaccination campaigns yearly and also make assessment to know from the cattle keepers the types of disease affecting them and their livestock..." (IDI, Public Health Officer).

7. Appendices

Appendix A: Terms of Reference

CONSULTANCY ADVERTISEMENT - TERMS OF REFERENCE FOR MID TERM EVALUATION FOR USAID/BHA PROJECT: VSF Germany

Terms of Reference for Midterm Evaluation

USAID / BHA Funded Conflict and Climatic Emergency Livestock Response Program in
Greater Upper Nile states, South Sudan

Background

VSF Germany is an International Non Governmental Organization, providing humanitarian aid and development assistance to pastoralists and vulnerable communities in areas where livestock is of importance. VSF Germany supports in animal health, livestock related agriculture, marketing, food safety, drought responses and mitigation, capacity development of communities and governmental institutions, peace and conflict resolution with the ultimate aim of food security and strengthened livelihoods of pastoralist communities. In the region VSF Germany implements activities in the Republic of South Sudan, Kenya, Sudan, Somalia, Uganda and Ethiopia. VSF Germany has been supporting pastoral livelihoods in South Sudan since 1998 working with communities in Upper Nile, Jonglei, Warrap, Eastern Equatoria, Western Bar el Ghazal and Lakes States through times of emergency and recovery to sustain, protect and restore livelihoods by direct provision; and capacity building for improved production and productivity, diversified production as well as local peace mechanisms and governance.

VSF-Germany partnering with VSF Suisse with funding from the U.S. Agency for International Development's Office of the Bureau for Humanitarian Assistance (USAID/BHA) is implementing a two-year program entitled "Conflict and Climatic Emergency Livestock Response Program (CCLERP) in Greater Upper Nile States". This program covers 10 Counties in Jonglei, 2 counties in Upper Nile, and 9 Counties in Unity states plus the Jonglei migrating cattle from Equatoria to Jonglei. The program objective is to improve or sustain access to animal source food and related income for crisis-affected individuals at risk of malnutrition particularly children and women. The program is targeting people in Greater Upper Nile, comprised of internally displaced persons (IDPs), host and returnee groups with support to local institutions and mechanisms for delivery of animal health and public health services while mainstreaming conflict sensitivity, protection, and Do

No Harm approaches.

VSF Germany and its partners intend to evaluate the performance of the Conflict and Climatic Livestock Emergency Response Program (CCLERP) at midterm and are seeking the services of qualified and experienced project evaluators.

Purpose

The purpose of this midterm evaluation is to examine the program performance against the planned indicators and results, and specifically:

- a) To determine the appropriateness, relevance, efficiency and effectiveness of the veterinary program;
- b) To assess the quality and comprehensiveness of the program design and implementation;
- c) To inform the implementation of the second phase (second year) of the program
- d) To document lessons learned, success stories, case studies, and perceived and real as well as unmet needs;
- d) Generate baseline data and information for subsequent interventions.

Scope

Provisionally, the evaluation will cover 8 payams (2 per county) in four randomly selected counties (one from each state and one additional from any one of the states depending on the existing situation) where feasible. It will be conducted in the project areas and will include both beneficiaries and non-beneficiaries. Key evaluation questions will be formulated using the project objectives and indicators, and project quality parameters.

Methodology

The midterm evaluation design will include participatory evaluation methods and employ a mixed approach with both qualitative and quantitative methods. The consultants will be required to submit a detailed draft evaluation design and methodology which will be reviewed and finalized with the effort of the program personnel.

Outputs

- a) A detailed study design, including methodology, work plan and timeframe;
- b) Inception report;
- c) A draft report incorporating feedback from the debriefing sessions;
- d) A final report incorporating feedback on the draft report (one bound hard copy & electronic copy).

Timeframe

This midterm evaluation is expected to be completed in 25 working days including inception report, desk review, field assessment and report writing. The first draft report will be expected within 10 days after the field exercise is completed. A final version should be submitted within five days of receiving feedback on the first draft.

Management

- a) The consultancy will be guided, managed, and technically advised by the Country Program Manager of VSF Germany;
- b) The consultancy is technically and administratively fully accountable to VSF Germany;
- c) Specific areas for the study will be selected in consultation with VSF's field staff;
- d) Field travel arrangements and immediate supervision will be carried out by VSF Germany & VSF Suisse in their respective areas of operation.

Qualification

The two-person evaluation team will consist of a team leader who will be a veterinarian and a supporting researcher who will preferably be an anthropologist or social scientist. Prospective evaluation teams are encouraged to include a mix of gender.

The team should collectively demonstrate the following set of qualities:

- a) Experience in carrying out two or more major humanitarian evaluations for a major donor, international NGO, or international organization.

Country

City

Organization

Type

Career Category

- b) General familiarity with the political and humanitarian context in South Sudan, particularly over the past 3 years
- c) Experience in developing or applying protection measures;
- d) Extensive practical experience in implementing activities aimed at pastoral livelihood;
- e) National consultants are encouraged to apply.

How to apply

Interested candidates should submit their profile and or curriculum vitae, a technical and a financial proposal. The financial proposal should comprise comprehensive professional fees; travel and

accommodation will be covered by VSF Germany.

Applications should be sent to the following Email addresses: recruitment@vsfg.org and copy juba@vsfg.org strictly indicating on the subject line "CCLERP MIDTERM EVAL 2021". Only short-listed candidates will be contacted for interviews. The deadline for submission of applications is 23rd May 2021.

Note: Due to the urgency of the assignment, the proposals will be reviewed on a rolling basis as received and the advert shall close automatically as soon as a suitable candidate is found.

Appendix B: Households' Population Disaggregated by Gender

Number of household members disaggregated by gender

# Females	Households	Total Females	# Males	Households	Total Males
0	3	0	0	3	0
1	17	17	1	26	26
2	113	226	2	127	254
3	187	561	3	229	687
4	311	1244	4	189	756
5	152	760	5	195	975
6	122	732	6	132	792
7	88	616	7	99	693
8	34	272	8	45	360
9	31	279	9	26	234
10	25	250	10	17	170
11	8	88	11	5	55
12	3	36	12	5	60
13	3	39	14	7	98
14	4	56	15	3	45
15	1	15			
16	2	32			
20	2	40			
21	2	42			
		5305			5205

Appendix C: Households' Primary School Completion Rates

Number of household members who have completed primary school					
# Females	Households	Total Females	# Males	Households	Total Males
0	519	0	0	385	0
1	293	293	1	266	266
2	173	346	2	283	566
3	54	162	3	96	288
4	32	128	4	42	168
5	20	100	5	16	80
6	10	60	6	10	60
7	7	49	7	3	21
			8	7	56
		1138			1505

Only 1,138 (21.45%) females have completed primary school compared with 1,505 (28.91%) males. For females, we arrive at this figure as follows: $(1138/5305) \times 100 = 21.45146$ rounded off as 21.45%. For males, $(1505/5205) \times 100 = 28.914505$ rounded off as 28.91%. The completion rates at secondary school level are $(602/5305) \times 100 = 11.35\%$ and $(953/5205) \times 100 = 18.31\%$ for female and male household members respectively. This pattern persists and probably widens at tertiary level with female completion rate at $(253/5305) \times 100 = 4.77\%$ compared with $(486/5205) \times 100 = 9.34\%$.