Crop Monitoring and Yield Estimation Tools For Pilot Counties

Data Collection and Reporting Format

Planted Area, Yield and Production Estimates of Main Crops for 2016 Cropping Season

March 2016

Date:_____

Crop Monitoring Tools for Pilot Counties

Data collection and Reporting Format

Planted Area, Yield and Production Estimates of Main Crops for the 2016 Cropping Season

Name of pilot County _____ (State _____)

Total number of Payams in the County ____, Total no. of Bomas _____

Number of Payams visited in the month____, up to this month _____

Number of Bomas visited in the month____, up to this month _____

Reporting period _____ to _____ (reflect cumulative data up to the reporting month)

1. General agricultural information (to be filled only once at the beginning)

1.1 Rainfall

- Rainfall pattern (put √), Bimodal _____, Unimodal _____* Irrigation _____
- Average annual rainfall of the area (long term average) ____ mm
- Normal starting time of 1st season rain _____, Cessation time _____
- Normal starting time of 2nd season rains _____, Cessation time _____

1.2 Livelihood zones and systems

Table 1. Main Livelihood zones of the county according to the country's classification, in %

Livelihood zone	Percent	Remark
Total	**100**	

Table 2. Main livelihood systems of the county's rural population:

Livelihood systems / types	Percent	Remark
Crop dependant population		
Agropastoral population (livestock and crop)		
Fishing		
Hunting		
Pure pastoralism		
Others/ specify		
Total	**100**	

1.3 Cropping patterns

- **Main crops**
  - Main crops in the county by area coverage in % _____(%) , _____ (%), _____ (%), _____ (%), _____ ___ (%), _____ (%)
  - Main cereal crops (area coverage) in %: Maize ____, Sorghum, ____ Rice ____, F/ millet ____, P/ millet ____
- Intercropping/ mixed crops and proportions of area in (%): ____, Sole crop area (%) _____

- Example crops: Maize (60%) vs Groundnut (40%) = 100%
- Main crop 1 _____ (____%) vs Minor crop _____ (____%) = 100%
- Main crop 2 _____ (____%) vs Minor crop _____ (____%) = 100%

- Main crop 3 _____ (____%) vs Minor crop _____ (____%) = 100%
- Main crop 4 _____ (____%) vs Minor crop _____ (____%) = 100%

➢ **Other crops:**

Table 3. Area planted to crops as pure stand and intercropped (mixed crop) with others

Crop type	Area planted (feddan)		Remark
	As Pure stand	Intercropped/ mixed	
Cassava			
F/ millet			
Pearl millet			
Groundnut			
Beans			
Sesame			
Rice			

Table 4. Main cash crops of the area (how much of the production sold and consumed?)

Name of cash crop	Proportion of product utilization (%)			Remark
	For HH consumption	Sold as cash crop	Total	
Example crop	40	60	100	
Groundnut				
Sesame				
Others/ specify				

Table 5. Average total planted area per HH by gender

Description	Simple farmers	Progressive farmers	Cooperatives members	Remark
Avg area planted per HH				
• *Male headed HHs*				
• *Female headed HHs*				
Total # of farmers				
• *Male (%)*				
• *Female (%)*				

2. Rainfall situation in 2016 cropping season (to be filled and updated each month)

- Actual starting time of 1st season rain this year (fill at the beginning)__/___/____, Cessation time __/__/____ (fill at the end)
- Actual starting time of 2nd season rain this year (fill at the beginning) ___/___/___, Cessation time __/___/___(fill at the end)

Table 6. Average monthly rainfall (mm) from local rain gauges and meteorological stations in mm, 2016

Station Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average												

3. Planted area estimations – 2016 (to be filled and updated each month)

3.1 Population and number of farming households - 2016

Table 7. Population and farming HHs of the county (total, rural and farming HHs) by Payam

Name of Payam	Payam population (mid-2016)	Returnees in 2016 (in coming)	Refugees/ IDPs in 2016 (outgoing)	Total No. of HHs mid-2016	% of Rural HHs, mid-2016	No. of Farming HHs, mid-2016	No. of farming HHs in 2015
P1_____							
P2_____							
P3_____							
P4_____							
P5_____							
P6_____							
P7_____							
P8_____							
P9_____							
P10_____							
Total							

P = Payam name

3.2 First season crops (2016)

- Average total area planted per household = _____ feddans (all crops)

Table 8. Area planted to main crops and proportion of farmers growing the crops in 2016 (first season)

Crop type	Average area planted /HH, feddan	% of farmers growing the crop	Total # of farmers in the county	# of farmers growing the crop	Total area planted with the crop, feddans	Total area planted with the crop, ha
	A	B	C	D = B x C	E = A x D	F = E x 0.42
Example crop	**2**	**90**	**5000**	**90% x 5000 =4500**	**2x4500=9000**	**9000 x 0.42= 3780**
Maize						
Sorghum						
F/ millet						
P/ millet						
Rice						
Sub-total Cereals						
Groundnuts						
Cassava						
Beans						
Sub-total, other crops						
Total (all crops)						

Note: 1 feddan = 0.42 hectares. This form should be completed at Payam and compiled at County level.

3.3 Second season crops in 2016 (if applicable)

- Estimated % of double cropped area (planted again) during the second season, _____ %
- Area of ratoon crop/ sorghum as percent of the main season sorghum field _____%

Table 9. Area planted to main crops and proportion of farmers growing the crops in 2016 (2nd season)

Crop type	Average area planted /HH, feddan	% of farmers growing the crop	Total no. of farmers in the county	Number of farmers growing the crop	Total area planted with the crop, feddans	Total area planted with the crop, ha
	A	B	C	D = B x C	E = A x D	F = E X 0.42
Example crop	**2**	**90**	**5000**	**90/100x500=4500**	**2x4500=9000**	**9000x0.42=3780**
Maize						
Sorghum						
Rice						

F/ millet						
P/ millet						
Groundnuts						
Cassava						
Beans						

Note: 1 feddan = 0.42 hectares. This form should be completed at Payam and compiled at County level.

3.4 Actual planting and harvesting dates of 1st and 2nd season crops (as applicable)

Table 10. Planting and harvesting times of first and second season crops – 2016

Crop	First season				Second season			
	Planting time (dd/mm/year)		Harvesting time (dd/mm/year)		Planting time (dd/mm/year)		Harvesting time(dd/mm/year)	
	Started	Completed	Started	Completed	Started	Completed	Started	Completed
Maize	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..
Sorghum	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..
Rice	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..
Groundnuts	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..
Cassava	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..
Sesame	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..
Beans	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..
Others/specify	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..
	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..	…./…./…..

3.6 Were there Extreme events which caused loss/ abandoning of planted areas due to factors such as conflict, flooding and drought? Explain the situations and provide figures as much as possible. Compare with that of last year.

- Names of affected Payams, _____, _____, _____, _____
- Reasons for under cultivation _____
- Number of affected population _____, Number of affected farming HHs _____
- Time of displacement _____
- Amount of land (feddans) uncultivated/ abandoned due to problem of access to land_____ feddans
- Provide details on the above situations:

  _____

  _____

  _____

3.7 Are there new settlements or other reasons (eg. returnees) that led to expansion of cultivated area during the season, compared to last year? Explain the situation and provide figures.

_____

_____

_____

4. Crop growth stage and performance at the time of reporting (to be filled and updated each month)

4.1 Indicate the growth stage and conditions of crops in the field

Table 11. Crop growth stage and condition in the field (put √) at the time of reporting month

Crop	Growth stage *(please tick only one box per crop)*						Crop condition *(please tick only one box per crop)*				
	Germination/ Emergence	Vegetative	Flowering	Maturing	Harvesting	Harvested	Very poor	Poor	Fair	Good	Very good
Maize											
Sorghum											
Millet											
Rice											
Groundnut											
Cassava											
Sesame											

Others/ Specify											

***/ Note: Fair =** Expected yields close to normal year or average +/- 10%; **good/poor =** +/- 10 to 25%; **very good/very poor =** +/- more than 25% of normal.

4.2 Describe the performance of individual crops against the prevailing rainfall and other factors (positively or negatively) during the current season.

Table 12. Performance of each crop during the month and up to the reporting month of current cropping season

Crop type	Description of performance
Maize	
Sorghum	
Millet	
Groundnuts	
Cassava	
Others/ specify	

NB: Describe performance in terms of vegetative growth (vigour), plant population, symptoms of moisture deficiency and production potential

Comment on any diseases, pests, climatic factors or anything that is affecting the development of the crop. If the development of the plant is "very poor" or "poor", specify whether the damages are reversible or not and also on any other crops:

4.3 Effect of the rainfall on growing crops

- Date of beginning of the planting rains (indicate day/month/year):……/……../…..… (To be filled in only once)
- Date of end of effective rains (indicate week/month/year):……./……../……..(To be filled in only once later in the season)
- Have the rains been excessive, adequate or insufficient this month in terms of amount?

  Insufficient ☐ Adequate ☐ Excessive ☐

- How has rainfall distribution of this month been compared to a normal year?

  Very poor ☐ Poor ☐ Fair ☐ Good ☐ Very good ☐

- Compare the suitability of rain to crops compared to last year?

  Very poor ☐ Poor ☐ Fair ☐ Good ☐ Very good ☐

- Dates of consecutive days without rain (Dry spells of 10 days and above) (indicate day/month/year): (To be filled in each month)

  From……../……../…… to ……../……../…… From ……../……../…… to……./……./……

- Are there areas in the county where there is **unusual** crop failure? Yes ☐ No ☐

- Was there replanting of seeds? Yes ☐ No ☐. Which crops were replanted? Give reasons for replanting

Table-13. Effect of hazards on crops and number of farmers affected

Type of hazard	Crops Affected	Crop Area affected (feddan)	% Crop Area affected	% of crop loss at present	How many households ** are affected currently	Name(s) of affected payams/	What other things have been affected by hazard- (Livestock, Gardens, Fish ponds or Others/specify)

						Bomas	
Total Number of Households Affected**							

**/ Agricultural and non-agricultural households.
Note: Hazards could be flood, pest/ diseases, drought, etc

5. Yield and production estimations of main crops – 2016 (to be filled from first harvest and updated each month)

5.1 Crop cutting/ sampling of main crops at Payam level

Table 14. Maize - Sampling results recording format (to be completed at harvest time)

Name of Payam	Sample size (4 sq. meter)	# of plants in the sample	# of cobs counted in the sample	Dry weight of grain in the sample (g/ 4 sq. meter)	Dry weight of grain (g/ sq. meter)	Yield, kg/ sq. meter	Yield, tons/ha
		A	B	C	D = C ÷ 4	E=D ÷ 1000	F= (E ÷ 1000) x 10000
Example		12	16	600	150	0.15	1.5
Sample-1							
Sample-2							
Sample-3							
Sample-4							
Sample-5							
Total/ Average							

Note: repeat recording results for each Payam using the same format

Table 15. Sorghum - Sampling results recording format

Name of Payam	Sample size (4 m2)	# of plants in the 4 m2 sample	# of heads counted in the sample	Weight of grain in the sample (g/ 4 m2)	Weight of grain (g/ m2)	Yield, kg/ sq. meter	Yield, tons/ha
		A	B	C	D = C ÷ 4	E = D ÷ 1000	F= (E ÷ 1000) x 10000
Example		20	20	700	175	0.175	1.75
Sample-1							
Sample-2							
Sample-3							
Sample-4							
Sample-5							
Average							

Note: repeat recording results for each Payam using the same format

Table 16. Summary of sampling results

Crop type	Number of Payams visited	Total # of samples taken	Average yield, tons/ ha	Remark
Example crop	10	50	= (S1+S2…..+S50) ÷ 50	Average yield of samples = sum total of average yield, divided by the number of samples
Maize				
Sorghum				
F/ millet				

P/ millet				
Others/				
Total				

Table 17. PET Score for Yield Estimations of main cereals – Walking transect by extension workers

Crop	Number of Payams	Red high	Red medium	Red low	Yellow high	Yellow medium	Yellow low	Blue high	Blue medium	Blue low	Total score
Maize											
Sorghum *short cycle*											
Sorghum, *long cycle*											
F/ millet											
P/ millet											
Others/											

Note: This should be collected at Payam level and then compiled at county level

Table 18. Final crop yield estimation at county level

Crop type	Yield estimation (kg/ feddan)		Yield (tons/ha)		Remark
	From crop cutting	From PET score	From crop cutting	From PET score	
	A	**B**	**D=A÷0.42/ 1000**	**E=B÷0.42/ 1000**	
Example crop	**600**	**400**	**1.43**	**0.952**	
Maize					
Sorghum					
F/ millet					
P/ millet					
Rice					
Others/ specify					

Note: Final crop yield estimation should be agreed by the County Crop Monitoring Committee (CMC)

Table 19. Yield estimations of other crops – based on Farmers & key informant interviews and close observations

Crop type	Yield (kg/ feddan)	Remark (higher or lower than last year)
Cassava		
Groundnuts		
Beans		
Sesame		
Others/ specify		

Note: Information should be collected at Payam level and then compiled at county level

Table 20. Total production (2016) at county level

Crop type	First season			Second season			Total		
	Area (ha)	Yield (tons/ ha)	Production (tones)	Area (ha)	Yield (tons/ ha)	Production (tones)	Area (ha)	Yield (tons/ha)	Production (tones)
	A	**B**	**C**	**D**	**E**	**F**	**G ≤ A**	**H = I ÷ G**	**I = C + F**
Example crop	**50**	**1.5**	**75**	**40**	**1.0**	**40**	**50**	**2.3**	**115**
Maize									
Sorghum									
Rice									
F/ millet									
P/ millet									
Groundnut									
Cassava									

Note: The total Area from two seasons will remain the same due to double cropping, to avoid double counting (same land used twice).

Table 21. Comparison of production between 2015 and 2016

Crop type	2015	2016	% change

	Area (ha)	Yield (tons/ha)	Production (tones)	Area (ha)	Yield (tons/ha)	Production (tones)	
	A	B	C = A x B	D	E	F = D x E	G = (F-C) ÷ Cx100
Example crop	**60**	**2**	**120**	**50**	**2.2**	**110**	**(110-120)/120 x 100 = -8.33**
Maize							
Sorghum							
Rice							
F/ millet							
P/ millet							
Subtotal cereals							
Groundnut							
Cassava							
Others/ specify							
Total							

5.2. Provide general comments on yield and production prospects of the season

- Has area planted to crops increased or decreased compared to last year? By how much %? ____
- Give reasons for the changes (give separate comments for the 1st and 2nd season)

  _____
  _____
  _____
- Is the total expected production better than the same season of last year?

  _____
  _____
- Which crops will show improvement and which ones will decline in production? Give reasons for each of the main crops.

  _____
  _____
  _____

6. Input availability and utilization at county level (to be filled and updated each month)

6.1 Provide comments on input utilization during the current cropping season compared to last year; include seed use, manure, chemical fertilizers, oxen / draft animals utilization, tractor availability, human labour availability

Table 22. Agricultural inputs distributed and used during the 2016 cropping season

Type of input distributed	Unit	Total amount distributed	Source/ supplied by (Agency)	Number of beneficiary HHs	Time delivered (actual)	Remark
Improved Seeds						
• Maize						
• Sorghum						
• Rice						
• Sesame						
• Cowpeas						
• Groundnuts						
• Assorted vegetables						
Local Seeds						

• Maize						
• Sorghum						
• Rice						
• Sesame						
• Cowpeas						
• Groundnuts						
Hand tools						
• Panga						
• Axe						
• Hoe						
• Sickle						
• Maloda						
Tractor & draft power						
• Tractors						
• Ox-ploughs						
• Donkey-ploughs						

Table 23. Total number of available tractors and draft power

Type of farm power	2015		2016		Remark
# of tractors in the county	Gov't	Private	Gov't	Private	
• Functional					
• Non-functional					
# of draft animals (pairs)					
• Pair of ox-ploughs					
• Pair of donkey ploughs					
# of manual tractors					

Comment on the quality, affordability and adequacy of the above inputs including timeliness of distribution to farmers.

6.2 Describe the availability of labour during the cropping season in comparison with last year, (↑ed or ↓ed) and reasons for changes. Was there labour movement to/ or from other areas? _____

_____

_____

Table 24. Prices of inputs (monthly) – 2016 compared to 2015

Input type	Unit	Unit cost		Remark (indicate the month)
		2015	2016	
Labor cost				
• Ploughing	SSP/feddan			
• Weeding	SSP/feddan			
• Harvesting	SSP/feddan			
Cost of ox-ploughing	SSP/feddan			
Cost of tractor ploughing	SSP/feddan			
Seed prices at planting time				
• Maize, improved variety	SSP/ kg			
• Maize, local variety	SSP/ kg			
• Sorghum, improved	SSP/ kg			
• Sorghum, local	SSP/ kg			
• Groundnuts	SSP/ kg			

• Cassava cuttings	SSP/ 100kg bag			
• Others/specify				
Prices of hand tools (local market)				
• Pangas	SSP/ piece			
• Maloda	SSP/ piece			
• Sickle	SSP/ piece			
• Hoe	SSP/ piece			
• Axe	SSP/ piece			

6.3. Manure and fertilizer utilization

- % of farmers deliberately applying manure in their crop fields _____
- % of farmers applying fertilizers in their crop fields_____
- Types and amount of fertilizers used in 2016 cropping season compared to last year_____, _____
- Describe method of manuring their crop fields _____
- Provide additional information, if any _____
  _____
  _____

7. Pests, diseases and weeds (to be filled and updated each month)

- What are the main pests and diseases in the area and the crops they affected during the cropping season? _____
  _____
  _____
- Indicate pests which have caused serious damage, average damage and minor damage? _____
  _____
  _____
- What control measures were taken through traditional and improved methods? _____
  _____
  _____
- Was the weed infestation normal, better or worse than last year? Provide comments? _____
  _____
  _____
- Indicate frequency of weeding for each main crop (1x, 2x or 3x) _____
  _____

8. Livestock conditions, pasture and water availability (to filled and updated each month)

- Provide livestock numbers of the main species (cattle, sheep and goats). Is the livestock population increasing or decreasing? Why?
- How are the pasture and grazing conditions compared to last year? Normal, better or lower? Give reasons for changes. Is there conflict over pasture?
- How is the livestock water condition compared to last year? Normal, better or lower? Give reasons for changes. Is there conflict over water?
- How is the body condition of Livestock (cattle, shoats) compared to last year? Provide scores of 1 – 5, from the worst to best condition.

- Which livestock diseases were prevalent during the season? Were they more serious or less serious than last year?
- Mortality rate: Adult ____ , Neonatal ____
- Kidding, lambing calving rate
- Any intervention (vaccination program/ treatment) by whom and against what diseases, where, when and how many?
- Cases of cattle raiding: # raided, by whom and when
- Cattle movement: transhumant/Sedentary and where are the cattle currently (indicate the month)
- Are there any intruding cattle?

9. Prices of main crops and livestock (to be filled and updated each month)

Table 25. Retail prices of main crops and livestock – 2016 (local measurement units should be converted to kg)

Commodity	Unit	Average monthly price (SSP)									Remark (# of markets)
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Maize	Kg										
Sorghum	Kg										
Cassava chips/ flour	Kg										
Male goat	Head										
Breeding goat	Head										
Breeding cow	Head										
Bull	Head										

Source: _____

10. Constraints and recommendations (to be filled and updated each month)

10.1 What are the main constraints to crop production in the county during the current season, in the order of importance?

1.
2.
3.
4.
5.

10.2 Give recommendations for improving crop production in the future (to be updated each month, as necessary)

1.
2.
3.
4.
5.

Name of Reporter _____, Title _____, Signature _____, Date _____

Name of Responsible Officer _____ Title_____, Signature _____, Date _____