Annex 1: Differential equations for mathematical model

Equations in Cattle

Compartment Diseased
Initial value=30
Rate of change=+ infected +enter2+treated-selfcure –die-d

Compartment Protected
Initial value =90
Rate of change= +prophylaxis + treated- lapse_of _prophylaxis- die-p

Compartment Susceptible
Initial value = 970
Rate of change = +lapse_of _prophylaxis + selfcure+ born + enter- prophylaxis-infected-die-s

Flow→ born
Born = sum((susceptible+diseased+protected))*0.15/365 – crossbreeds*sum(susceptible+diseased+protected)*0.2/(365*10)

Flow→ die d
Die d=0.2*diseased/(duration illnes=100)

Flow→ die p
Die p=0.05* protected/(protection period of TC=120)

Flow→ enter
Enter = if sum(protected+diseased+susceptible)<900 then rand_const(50-125)/365 else rand-const (5-20)/365

Flow→ enter2
Enter 2 = rand-const(10-50)/365

Flow→ infected
Infected=infected_fly* susceptible_cow*0.01/cross-breeds/365
Transmission coefficient st to 0.02, literature estimates 0.008 to 0.29

Flow→ lapse of prophylaxis
Lapse of prophylaxis=protected * diseased/(treated+diseased+susceptible)/15 + protected*susceptible/(o.25*susceptible +diseased+treated)/90

Flow→ prophylaxis
Prophylaxix = 0.25*susceptible/365 -0.25*susceptible*resistance/365 – 0.25*susceptible*cross-breeds*0.1/365

Flow→ selfcure
Selfcure=0.8*diseased*cross-breeds*crossbreeds*crossbreeds/7

Flow→ treated
Treated = diseased*0.4/49*1/crossbreeds*0.5*resistance/49

Variable Resistance
Resistance= 0.001+ 0.0001*diseased+0.001*crossbreeds
Comment 1=fully resistance, 0.001=minimal resistance

Variable Crossbreeds
Crossbreeds=0.05
Comment 1= trypanotolerance, 0.5 =trypanosusceptible

Equations in tsetse

Compartment Infected fly
Initial value = 50
Rate of change = + infection of fly + extra – death

Compartment Susceptible fly
Initial value = 4851
Rate of change = +growth – death - infection of fly – extra death from VC

Flow → extra death
Extra death = vector control * susceptible fly

Flow → death
Death = if susceptible fly< 4851 the susceptible fly/6000 else)
Comment density dependent death

Flow → extra death
Extra death= vector control * infected fly

Flow → infection of fly
Infection of fly = susceptible fly * diseased host* 0.02*0.0005/365 + susceptible fly * infected host* 0.02*0.0005/365
Comments transmission from infected host to vector estimates 0.025 to 0,177

Variable Vector Control
Vector control =0

Equations in alternative hosts

Compartment Infected
Initial value = 1000
Rate of change = + infection – exit

Compartment Susceptible
Initial value=1000
Rate of change = + entry – infection
Comments assumes steady state population of alternative hosts

Flow → entry
Entry = Susceptible host * infected fly *0.02/365
Comments transmission from infected host to vector estimates 0.025 to 0,177

Flow → exit
Exit = Infected alt host * infected fly* 2/100/365

Flow → infection
Infection = Susceptible infected host * infected fly *0.02/365

Annex 2: Cost benefit analyses

All strategies are based on the average village of 26 farmers and 426 cattle. Assumptions and costs are as follows:

Intervention one: Participatory vector control

Table 1: Year one costs for participatory vector control in four villages

	Unit	Cost per unit $	No. units	Total cost	
Costs of running project	village	1038	1	1038	
Cost of screens	screen	2	60	120	
Insecticide to treat screens	litre	18	3	54	
Additional sprays for cattle	cow treated	0.08	1922	154	
Time needed by farmers	farmer day	2	364	728	2094

- The costs of running the project are the actual costs of the vector control project in Burkina Faso. The costs of screens and insecticides are market prices.
- The cost of insecticide treatment of cattle is based on the findings of the project. Farmers give six additional treatments per cow, and treat 75% of the village herd (427 cattle, the average herd size for the three study sites).
- There are 26 households per village (average for the 3 study sites) and each household spends ten days on project set-up activities, two days on additional spraying of cattle and two days on placing, checking and removing screens of two weeks in total per household. The price is that of a days labour in the study area

Table 2: Running costs for Participatory Vector Control in four villages

	Unit	Cost per unit ($)	No. units	Total cost ($)	
Insecticide	litre	18	3	54	
Replace screens	screen	2	6	12	
Additional sprays	cow treated	0.08	1922	154	
Time	farmer day	2	104	208	428

- It is assumed that 10% of screens need replacement each year
- Each household gives 4 days per year for spraying and screen placement.

Year 1- 10: Benefits
The average value of a bovine was calculated from the population structure available for Burkina Faso and Sikasso and price data from Burkina Faso.

Table 3; Herd structure for villages in Burkina Faso and Mali

Category	Number	Range of prices	Assumed Value	Value cattle
Adult M	1035	70 000-125 000	70 000	72 450 000
Adult F	816	50 000- 80 000	50 000	40 800 000
<4 years	1268	20 000- 40 000	20 000	2 536 000

The lowest value was taken as a conservative value because prices in Burkina Faso are higher than in Mali and Guinea From this the average value of a bovine was 37122.8 CFCA, or $74 using the exchange rate of 2002.

The annual mortality rate in the three study sites is 0.06%. The average village has 427 cattle. In villages with vector control in Burkina Faso the mortality was 0.293 of that without vector control. It is assumed that this level of benefit can be extrapolated to the rest of the study area.

This is reasonable as this level of benefit was reported from other vector control projects in other areas.

Annual losses for a village without VC

= price bovine X mortality rate X number of cattle in village

=$74 X 0.06 x 427 = $1896

Annual losses for a village with VC

=$74 X 0.06 X 0.293 X 427 = $555

Difference = 1340 = Annual benefits of vector control

It is assumed that in the first year benefits are 50% of in the other years; vector control usually takes 6-9 months to be effective.

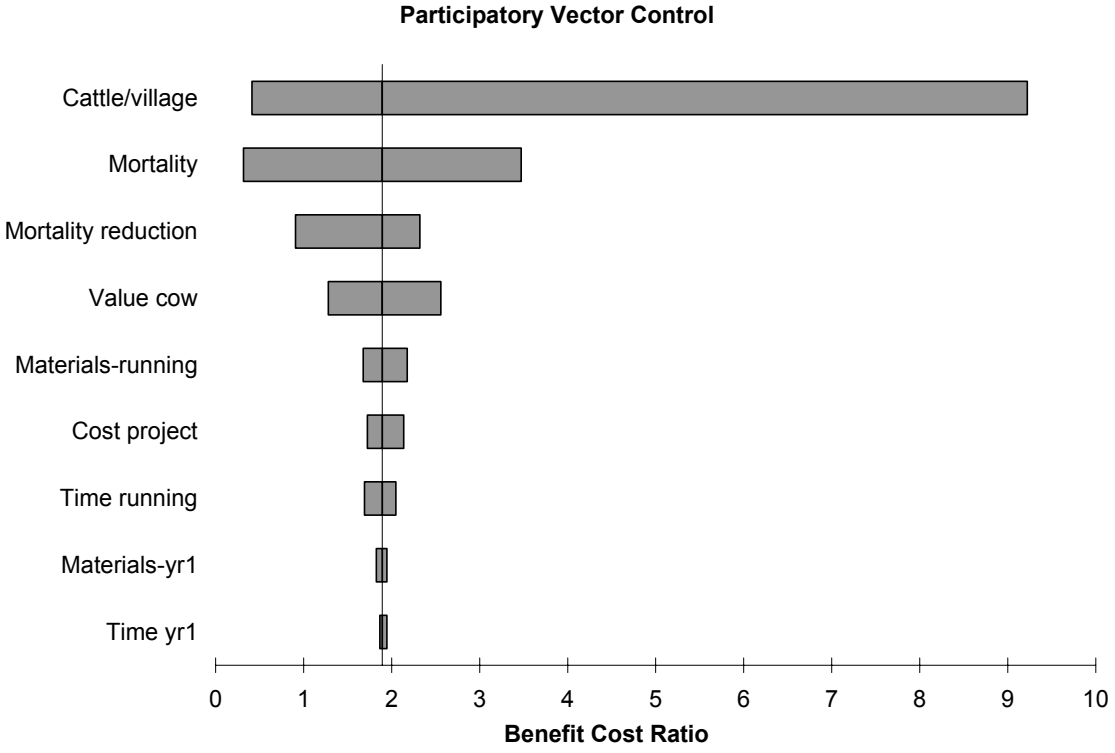
Sensitivity analysis was used to take into account a) the range of different scenarios in the study area, b) the accuracy of estimates (based on upper and lower confidence limits) and c) possible variations in prices of important inputs and outputs.

Table 4: Range of values for sensitivity analysis of participatory vector control

	Best estimate	**Low estimate**	**High estimate**	**Source of uncertainty**
Cost project	1038	500	1500	Possible change in price
Materials-year 1	328	200	500	Possible change in price
Time costs – year 1	728	600	800	Possible change in price
Materials-running	220	120	320	Possible change in price
Time costs- running	208	150	300	Possible change in price
Value cow	74	50	100	Range in project area
Mortality	0.06	0.01	0.11	Range in project area
Mortality reduction	0.29	0.13	0.66	Confidence interval
Cattle/village	427	93	2080	Range in project area

At low levels of mortality, or cattle per village participatory vector control did not break even. The estimates of the effectiveness of VC were sufficiently precise to be confident that VC would have a Benefit to cost ratio greater than one.

Figure 1 Sensitivity analysis for Participatory vector control



Intervention two: Trypanotolerant cattle

Year one losses: Start up
Decline in value of herd
= number of cattle in village X price of bovine X differential in price when trypanotolerant
= 427 X $74 X 0.2 = 6320 USD
The price differential between trypanotolerant and trypanosusceptible cattle is10-30% (Kamuanga et al, 2001).

Year 1-10 costs: None

Year 1- 10 benefits
In herds with only trypanosusceptible the annual mortality was 0.109 while in herds with only trypanotolerant cattle the mortality was 0.024.

Annual losses assuming that all village cattle are trypanosusceptible
= price trypanotolerant X mortality rate X number of cattle in village
= $74 X 0.109 X 427 = $3444
Annual losses assuming all the village herd is trypanotolerant
=$74 X 0.8 X 0.024 X 427 = $607
Difference = 3444 - 607 = 2838 = annual benefits of trypanotolerant cattle

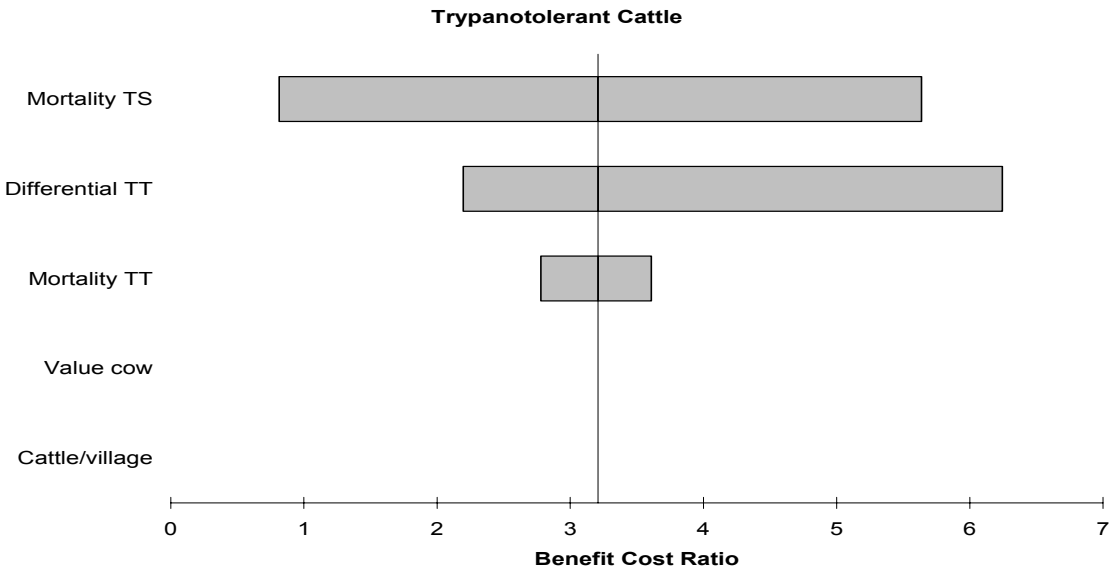
Table 5: Range of values for sensitivity analysis of the strategy of keeping trypanotolerant cattle

	Best Estimate	Low Estimate	High Estimate	Source of Estimates
Value cow	$74	$50	$100	Range in study area
Mortality TS	0.109	0.042	0.177	Confidence interval
Mortality TT	0.024	0.01	0.039	Confidence interval
Cattle/village	427	93	2080	Range in study area
Differential TT	0.2	0.1	0.3	Range

* Percentage difference in price between trypanotolerant and trypanosusceptible cattle

When the mortality rate in trypanosusceptible cattle was low, the intervention was not cost effective.

Figure 2 Sensitivity analysis for strategy of trypanotolerant cattle



Intervention three : a) Provision of Rational Drug Use information to farmers

Year 0: Start up costs
Development of information 5000 USD for 50 villages = 100 USD per village

Year 1- 10: Running costs
(Cost of brochure + cost of distribution) x number of farmers = 0.22X 26 = 6

Year 0 to 10: Benefits
In the three study areas the loss from AAT is on average 0.9 animals per herd.
Farmers who get RDU information have a 20% less chance of experiencing mortality.

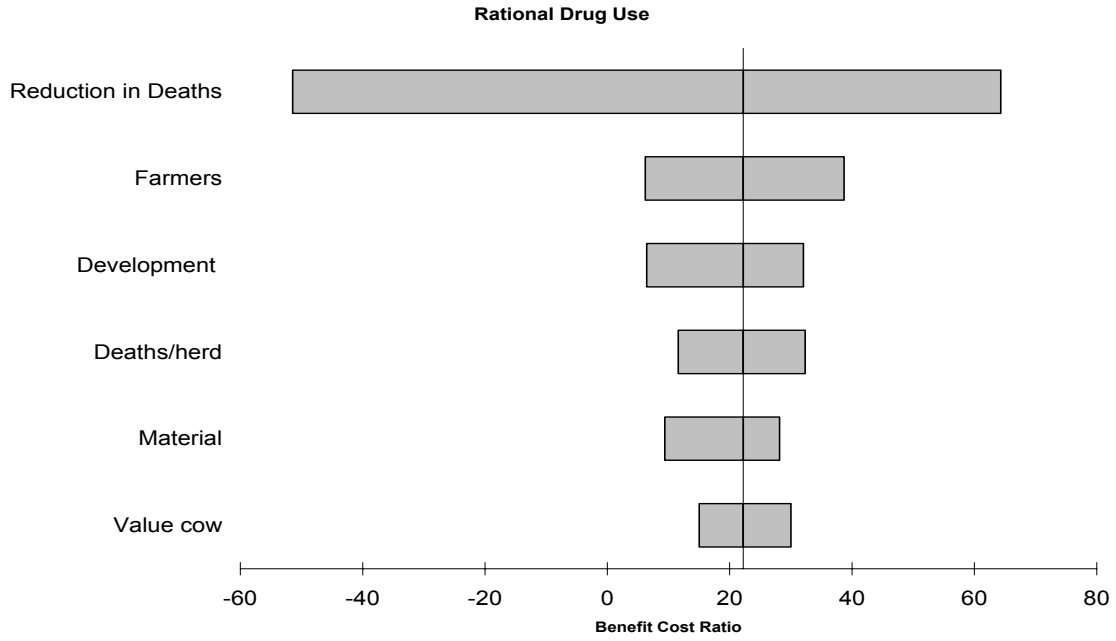
Annual losses without RDU
=farmers X average deaths per herd X value bovine
= 26 X 0.9 X 74 = 1732
Annual losses with RDU
= farmers X reduction in chance of mortality X average deaths/herd X value bovine
=26 X 0.81 X 0.9 X 74 = 1402
Difference = 329 = annual benefits of RDU

Table 6 Range of values for sensitivity analysis of RDU provision

	Best estimate	**Low estimate**	**High estimate**	**Source of Estimates**
Development	$100	$50	$500	Possible range in price
Material	0.22	0.1	1	Possible range
Farmers	26	5	85	Range in study area
Deaths/herd	0.9	0.47	1.31	Confidence interval
Reduction Deaths	0.81	0.45	1.44	Confidence interval
Value cow	74	50	100	Range in study area

The intervention had an attractive benefit to cost ratio over all the conditions in the study area. However, because of the short follow-up period, the estimates of the impact of the intervention on mortality were very imprecise.

Figure 3 Sensitivity analysis for RDU provision



Intervention three : b) Establishing primary animal health care

Year 0: Start up costs

Table 7 Costs of training paravets (one week) for four villages

Item	Units	Unit cost FCFA	Total cost FCFA	Total cost USD
Staff per diems	12	5,000	60,000	100
Room for class	3	1,000	3,000	5
Day lodging and food	192	2,000	439,000	631
Material	24	900	21,600	36
Kit	24	2,500	60,000	100
		Total	583,600	973

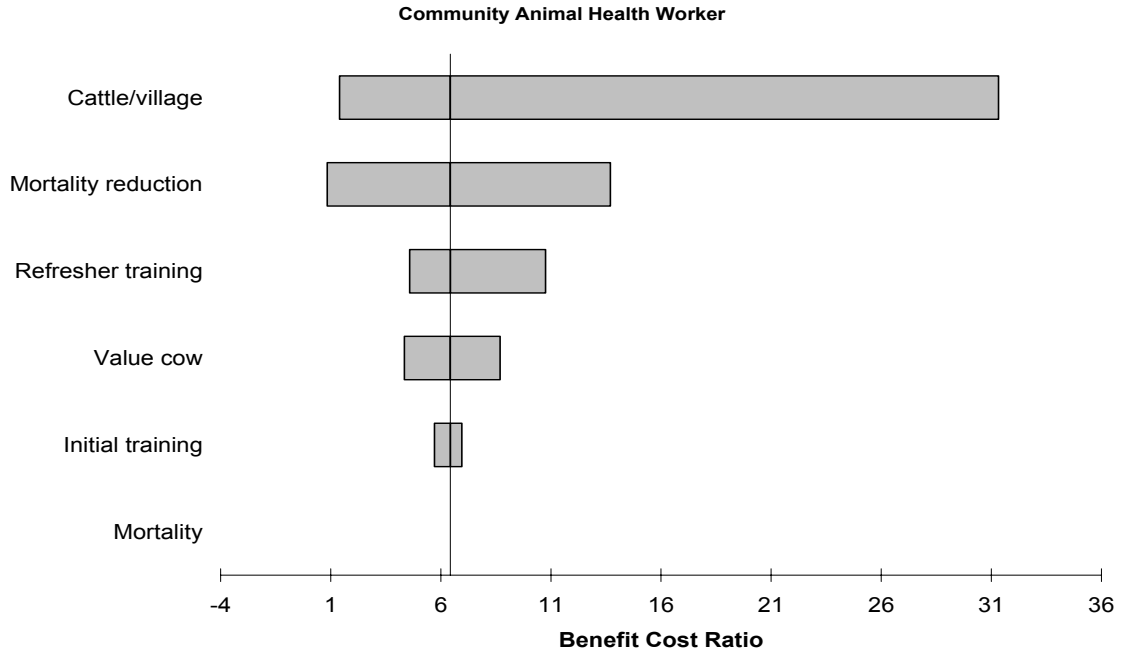
Costs of training paravets are $243 per village
Year 1-10 Running costs
Costs of refreshing training 1-2 days $100 per village

Year 1-10 Benefits
Among farmers using paravets there was a reduction in 2.3% per year
Annual losses for a village without paravets
= price bovine X mortality rate X number of cattle in village
=$74 X 0.06 X 427 = $1896
Annual losses for a village with paravets
=$74 X (0.06-0.023) X 427 = $1169
Difference = 727 = Annual benefits of vector paravet

Table 8 Range of values for sensitivity testing of training paravet strategy

	Best estimate	Low estimate	High estimate	Source of Estimates
Initial training	$243	$150	$400	Range of possible prices
Refresher training	100	50	150	Range of possible prices
Value cow	74	50	100	Range in study area
Mortality	0.06	0.01	0.11	Confidence interval
Mortality reduction	0.023	0.003	0.049	Confidence interval
Cattle/village	427	93	2080	Range in study area

Figure 3: Sensitivity analysis for paravet training



Intervention three: c)Training existing service providers

Year 0: Start up costs

Table 9 Costs of training service providers (two days); 48 service providers were trained delivering services to 235 villages

	Guinea Francs	FCFA	US$
Perdiems	960000	240000	436
Accommodation	2160000	540000	982
Food	60000	15000	27
Materials	510000	120000	218
Attendance	1000000	250000	455
Workshop	2000000	500000	909
Extension material	240000	60000	109

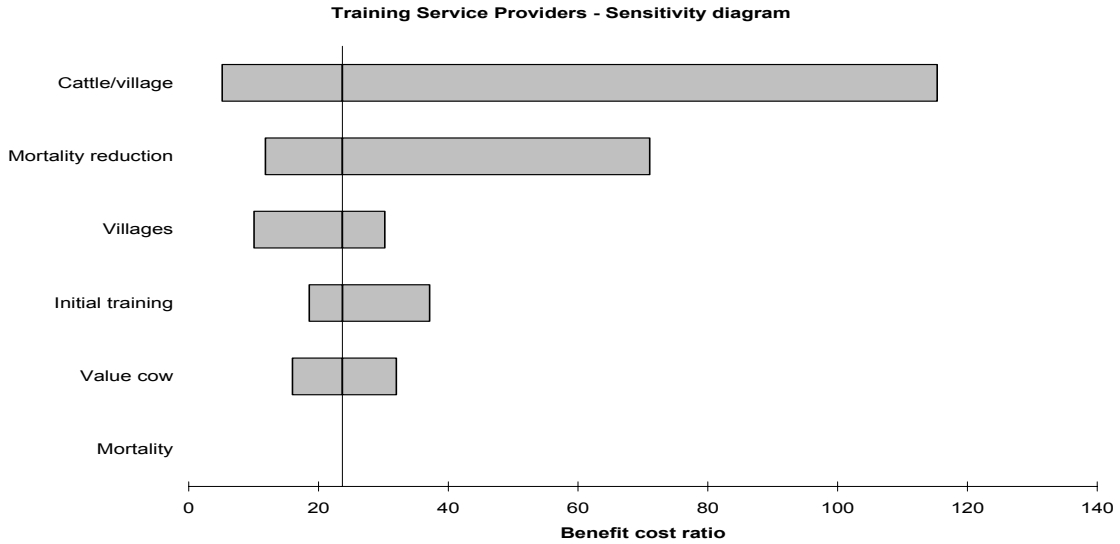
Costs of training paravets are $3136 in total or $13 per village
Year 1-10 Running costs
We assume the workshop is repeated every year, at the same cost

Year 1-10 Benefits
We make a conservative assumption that the decline in mortality was 1% per year. Training paravets was associated with a reduction of 2.3% in mortality.
Annual losses for a village without service provider training
= price bovine X mortality rate X number of cattle in village
=$74 X 0.06 X 427 = $1896
Annual losses for a village with trained service providers
=$74 X (0.06-0.01) X 427 = $1169
Difference = 727 = Annual benefits of vector control

Table 10 Range of values for sensitivity testing of training service provider strategy

	Best estimate	**Low estimate**	**High estimate**	**Source of Estimates**
Initial training	$3136	$2000	$4000	Range of possible prices
Value cow	74	50	100	Range of possible prices
Mortality	0.06	0.01	0.11	Range in study area
Mortality reduction	0.01	0.005	0.03	Assumed
Cattle/village	427	93	2080	Confidence interval
Villages covered	235	100	300	Range of possible cover

Figure 4 Sensitivity analysis for service provider training



Annex 3: Data collection forms

A selection of the most important data collection forms are presented in this annex.

Participatory Vector Control: disease and production baseline

Date/time

Observer

Village

1	Animal ear tag number											
2	Owners name											
3	Animal Age											
4	Sex category (ME, MN, BF,											
5	Breed											
6	Obviously sick (No, Yes) IF YES GOTO sheet MM											
7	Body condition score (1/2/3/4/5)											
8	Weight (KG)											
9	Lactation (**M**ilking, Never milked, date stopped))											
10	**A**bortion, or **S**tillbirth in last yr date											
11	Normal calving											
12	Status last calf											
13	Worked last year											
14	Disease in last year											
15	Owner diagnosis disease											

Participatory Vector Control : longitudinal study

Date/time

Observer

Village

1	Numéro de l'animal bouclé											1
2	Animal malade (Oui, Non)											2
3	Malade les 4 derniers mois (Oui, Non)											3
4	Condition (score) (1/2/3/4/5)											4
5	Nombre de jours de travail le mois dernier											6
6	Lactation (en lactation, pas en lactation si **a**rrêtée les 4 derniers mois écrivez la date,)											5
7	**A**vortement, **M**ort-né, **V**êlage **n**ormal les 2 derniers mois (écrivez le date)											7
8	Information sur la progéniture (veau ou velle) de la vache les 2 derniers mois (**R**esté, **M**ort, **S**orti)											8
9	Sorti de troupeau les 2 derniers mois*											9

***V**endu, **A**battage **P**rogrammé, **A**battage non **P**rogrammé, **V**olé, **P**erdu, **P**rêt, **D**on, Autres

Situational Analysis: clinic attendance form

Owner Age, race Sex Ear tag Condition Staring coat Enlarged ganglions Lacrimation Pale mucous membranes Temperature Other signs Diagnosis: Proprietor Diagnosis: Agent Duration sickness Previous treatments, drugs quantity, Date treated Weight Treatment given Follow-up needed

Participatory Vector Control : longitudinal study

Numéro de l'animal bouclé

Malade en ce moment, **G**uéri, **M**ort

Symptômes (**P**rimaire, **S**econdaire)

	P/S				
Lamoiement		Diarrhée			
Salivation		Constipation			
Ecoulement Nasal		Urine rouge			
Membranes muqueuses Pale		Ecoulement Vaginal			
Toux					
Difficulté Respiratoire		Manque d'appéti			
Poils piqués		Emaciation			
Lésions de la peau		Dépression			
Abcès		Fièvre			
Boiterie		Lymphadenopathy			

Diagnostics de l'éleveur

Traitements donnés Oui / Non

Si traitement est donné

	Traitement A	Traitement B	Traitement C
Quel médicament?			
Quantité donnée (dose & concentration)			
Date du premier traitement			
Combien de fois la dose a été répétée ?			
Qui a donné le traitement (nom, rôle)			
Réponse			
Lieu d'obtention du médicament			
Coût (total & par unité)			

Diagnostics

Conseil du spécialiste / traitement

Résultats de tests de laboratoire

AAT	
Haemoparasites	
PCV	
Coprologie	
Brucellose	
Autre	

Situational Analysis: village PRA

Village Date Recorder

Overview and census Tools: Mapping/Transects
- Livestock owning households
- Number of livestock kept
- Length of riverine galleries
- Resources in village

Wealth ranking Tool: Ranking
- Setting wealth criteria
- Livestock ranking

Household budget Tool: Proportional Piling
- Expenditure and income for each wealth category
- Detailed animal health expenditure

Womens role in livestock Tool: Group discussion
- Asset ownership, control and use

Importance of livestock. Tool: Listing and ranking using picture cards
- Progeny histories
- Herd entry and exit
- Problem trees

Treatment decisions Tool: Flow chart

Understanding of trypanosomosis Tool: Listing and Ranking
- Symptoms
- Cause
- Animals affected
- Health seeking behaviour
- Prevention
- Treatment
- Treatment failure

Animal health service providers Tool: Mapping
Criteria for choosing Tool: Listing and ranking

Institutional assessment Tool:Venn Diagram
- Internal organisations
- External organisations

History of key events Tool:Time Line
- General
- Livestock

Situational Analyis: Knowledge Attitude and Practice Survey

Village:	Nom du répondant:

1- Généralités

1.1- Nombre de personnes dans l'exploitation. Total.. Actifs…….. Non actifs.....

1.2 Est-ce que vous (ou les membres du votre ménage) aviez participés dans les événements sociaux au cours des 12 derniers mois. Si oui, quel est le nombre total de jours de participation et quelle est la dépense totale (cotisation)?

	Association de parents d'élevés	Gr. Elev	Gr. Femme	Gr. Riz	Sofitex	Autre Gr	Construction de routes, puits, ponts etc	Tontine	Tontine agriculture	Chasseurs	Fêtes religieuses	Fêtes traditionnelles	Fêtes – individuelle
Jours de participation													
Cotisation													

1.3- Combien de vélos et de mobylettes/Motos, voitures et autres biens dispose l'exploitation ?

Vélos	Mobylettes/Motos	Voiture

1.4- Autres indicateurs de bien être

Maison en ciment ___/ En terre battue ___/ Toit en tôles ___/ Toit en pailles ___

Charrue ___/ Charrettes ___/ Semoirs ___/

Radio ___/ Télévision ___/

2- Production Animale

2.1- Composition du troupeau de bovins

Catégories	Zebu	Metis	Baoule	Boeufs de labour
Veaux et velles de 0 à 1 an				
Mâle entier > à 1 an				
Mâle castré > à 1 an				
Génisses				
Vaches				

2.2 Quel est le rôle des bovins dans l'exploitation? (Par ordre d'importance)

Rôle	Réponse	Ordre		Réponse	Ordre
Production de viande			Pour la traction animale		
Production de lait			Cérémonie		
Production de fumier			Autres spécifiez		
Epargne / assurance					
Pour la vente					

2.3- Quelles sont les raisons de choix de la race la plus importante dans le troupeau

1.....

2.....

3.....

2.4- Qui a la responsabilité au niveau du ménage pour:

Décider du lieu de pâturage	
Décider du lieu d'abreuvement	
Décider du traitement d'un animal malade	
L'achat des médicaments	
Administrer les médicaments	

3- Alimentation et abreuvement des animaux

3.1- Utilisez-vous des compléments d'alimentation? Oui ou Non Si oui lesquels?

	Réponses	Quand? (saison)	Combien de fois par semaine?
Sels			
Fourrages cultivés			
Feuilles / et autres produits de la brousse			
Résidus de transformation des produits agricoles			
Les résidus de récolte			
Autres			

3.2- Aviez-vous fait la transhumance au cours des 12 derniers mois? Oui ou Non

1- Quand au cours de l'année (saison)?	
2 - Lieu	
3- Durée	
4- Distance	
5- Proportion d'animaux	
6- Qui décide du lieu de transhumance ?	

3.4- Quelle est la source d'eau par importance?

	Ordonner par importance	Pendant quelle saison	Distance moyenne aux points d'eau pendant la saison sèche?	Distance moyenne aux points d'eau pendant la saison pluvieuse?
Barrage				
Puits / forage				
Marre/Puisard				
Cours d'eau				
Autres				

4- Connaissance de la trypanosomose animale

4.1- Au cours des 12 derniers mois aviez-vous eu des bovins malades?
Oui ou Non

4.2- Quel genre de problème aviez-vous eu sur les bovins ?

	Réponse	Ordre		Réponse	Importance
Diarrhée			Constipation		
Toux / poumons			Larmoiement		
Plaies			Signes nerveux		
Boutons sur la peau			Abcès		
Vers intestinaux			Boiterie		
Tiques			Faiblesse		
Trypanosomose			Autres - specifiez		
Avortement					
Fièvre aphteuse					

4.3- Au cours des 12 derniers mois aviez-vous eu des bovins malades avec la trypanosomose?

Combien étaient malades?	
Combien étaient morts?	

4.4- Parmi ces signes quels sont les signes de la trypanosomose?

Larmoiement		Diarrhée	
Boutons sur la peau		Ganglions élargi	
Constipation		Mange la terre	
Avortement		Faire des ronds	
Bouche Blanchâtre		Urine Rouge	

4.5- Comment un animal peut tomber malade de la la trypanosomose?

	Réponse	Importance		Réponse	Importance
Mouches tsé-tsé			A partir d'autres animaux malades		
Autres mouches			Autres - specifiez		
Tiques					
A partir de l'eau					
Insuffisance alimentaire					
Sortilège					

4.6- Supposons qu'un animal est atteint de la trypanosomose

L'animal peut être guéri sans traitement ?	Oui	Non
Si Oui combien d'animaux sur 10 peuvent être guéri?	Saison sèche	Saison pluvieuse
Est-ce que l'animal peut à nouveau attraper la maladie?	Oui	Non
Si oui après combien de temps (en moyenne)		

4.7- Si vous n'aviez pas de l'argent pour traiter tous les animaux malades, quelle catégorie d'animaux traiteriez-vous par preference? Citez par importance

Catégories d'animaux	Importance
Veaux et velles < à 1 an	
Jeunes mâles & femelles	
Vaches	
Vaches en lactation	
Bœufs de labour	

4.8- Qu'est-ce que vous aviez fait la dernière fois lorsqu'un animal est tombé malade de la trypanosomose?

	Réponse	Importance	Autres (nommées)	Importance
Demander des conseils				
Traiter soi-même				
Rien fait				
Tuer l'animal				
Vendre l'animal				

S'il a demandé conseils, spécifier la personne chez qui il a demandé conseils:

4. 9- Est-ce que l'animal a été traité avec un médicament? Si oui lequel?

4.10- Connaissez-vous autres médicaments (moderne ou traditionnel) pour guérir cette maladie?
Oui ou Non Si Oui citez-les

	Connais	Déjà utilisé	Plus efficace
DIM			
ISMM			
Comprime vert			
Tetracycline gellule			
Oxy injections			
Nere			
Autres			
Autres			

4.13- Quelles peuvent être les raisons pour lesquelles cette maladie n'obéisse pas aux traitements? citez les par importance

1.....
2.....
3.....
4.....
5……

4.14- Que faites-vous lorsque la maladie n'obéit pas aux traitements?

	Importance		Importance
Augmenter la dose		Répéter le même traitement	
Changer de médicament		Se séparer de l'animal	
Demander conseils		Autres spécifiez	

4.15- A votre avis comment peut-on éviter / prévenir cette maladie

Méthodes	Réponse	Ordre		Réponse	Ordre
Ecran / piège			Traditionnelle		
Trypamidium			Baoule		
Pulverisation			Autres specifiez		
Berenil					
Baoulé/trypano tolérant					
Eviter les mauvais endroits					

4.16 Quelles sont vos dépenses sur les médicaments vétérinaires pendant les 12 derniers mois ?

Tiques	Rouge	Jaune	Oxy injection	Gellules	Comprimés	Pastovax	Charbon	PPCB

4.17 Quel est le rôle du berenil et du trypamidium? Pour chaque rôle combien d'animaux sont traités l'année passée ?

	Berenil		Trypamidium	
Guérir la trypanosomose				
Prévenir la trypanosomose				
Donner la force à l'animal				
Donner l'appétit à l'animal				
Autres				

RDU- Village information

1. Nom du Village:
2. Commune:
3. Kilomètres de Sikasso :
4. Groupe Ethnique:
5. Nombre d'exploitations:

6a Combien de troupeaux de chaque catégorie y a-t-il dans le village ?
6b Combien de troupeaux ont les vrais métis (avec bosse) et combien ont zébus ?

	Définition	Nombre	N° avec vrais métis	N° avec zébus
Grands troupeaux	30 ou plus			
Moyens troupeaux	10 a 30			
Petits troupeaux	1 a 9			

7. Producteurs impliqués dans l'étude

		Nom	Nombre dans le troupeau
Grands troupeaux			
Moyens troupeaux			
Petits troupeaux			

8 Dates importantes

	Commencement	Utilisation > 50%
l'attelage		
métis		
trypanocides		
Echecs de traitement		

RDU- Census of village cattle

Village **Date**

	Propriétaire	bovin	Age	Sexe	Race	Robe	Maladie
1							
2							
..							
n							

RDU- Knowledge and practice

Village

1. S'il vous plaît, indiquez combien de seringues d'eau vous ajouteriez à un **grand** sachet de Veriben® - (*Utilisez une seringue*)
2. S'il vous plaît, indiquez combien vous donneriez à un zébu adulte. - (*Utilisez une seringue*)
3. S'il vous plaît, quels sont les signes distinctifs de la trypanosomose? (Larmoiement, Anaemia, Ganglions élargis)
4. S'il vous plaît, indiquez les bonnes places pour faire une injection. –
5. S'il vous plaît, pourquoi utlisez-vous l'albendazole et l'oxytetracycline.

Nom du producteur	1. Ml eau	2. Dosage zébu adulte	3. Malade de la tryps			4. Site d'injection		5.Traitements	
			Larmoiement	Anaemia	Ganglions elargis	A	B	Med 1	Med 2