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## APPENDICES

### APPENDIX 1: Tables of Social and Economic Indicators

Table 1.1: Location of the Six Experimental Communes in Bénin

Experimental Communes	Population	Districts	Provinces
1. Agatogbo	7,961	Come	Mono
2. Djougou2	17,336	Djougou	Atacora
3. Hevie	7,058	Abomey-Calavi	Atlantique
4. Paouignan	18,075	Dassa-Zoume	Zou
5. Sori	13,391	Gogounou	Borgou
6. Takon	8,582	Sakete	Oueme

Source: CREDESA (1992) La décentralisation des soins dans les communes sentinelles du PEV/SSP (Unpublished report).

Table 1.2: Changes in GDP of Bénin from 1991 to 1993

Year	GDP (million)	GDP (1991 price)	Growth of GDP	GDP deflator
1991	535,521.8 Franc (\$ 1,879)	535,521.8 Franc (\$ 1,879)	4.7	180
1992	573,744.3 Franc (\$ 2,013)	557,480.7 Franc (\$ 1,956)	4.1	290
1993	611,321.3 Franc (\$ 2,145)	577,590.8 Franc (\$ 2,027)	3.6	280

Table 1.3: The Six Leading Causes of Morbidity and Mortality in Bénin from 1990 to 1994.

Diseases		1990	1991	1992	1993	1994
Malaria	Number of Cases	92,878	118,786	290,004	396,471	539,695
	Average incidence	20 per 1000	24.3 per 1000	57 per 1000	78.2 per 1000	103 per 1000
	Incidence < 1 year	61%	8 %	196 per 1000	248 per 1000	176 per 1000
	Incidence 1-4 years	26 per 1000	30.9 per 1000	89 per 1000	111.2 per 1000	
	Incidence > 5 years	16 per 1000	20.3 per 1000	45 per 1000	62.5 per 1000	-
Diarrhoeal diseases	Number of Cases	36,527	49,041	146,768	106,758	140,962
	Average incidence	8 per 1000	14.5 per 1000	29.1 per 1000	21.1 per 1000	27 per 1000
	Incidence < 1 year	49 per 1000	75.6 per 1000	121 per 1000	131.6 per 1000	125 per 1000
	Incidence 1-4 years	15 per 1000	28 / 1000	54 /1000	35/1000	48 per 1000
	Incidence > 5 years	4 per 1000	9/1000	20 /1000	13.7/1000	17.4 /1000
Acute respiratory infection	Number of Cases	61,087	100,905	151,486	196,590	232,685
	Average incidence	13 per 1000	20.6 per 1000	30.1 per 1000	38.7 per 1000	44 per 1000
	Incidence < 1 year	62 per 10000	95.6 per 1000	154.3 per 1000	201.5 per 1000	200 per 1000
	Incidence 1-4 years	23 per 1000	39.7 per 1000	56.6 per 1000	66 per 1000	103 per 1000
	Incidence > 5 years	9 per 1000	13.5 per 1000	19.2 per 1000	24.6 per 1000	-
Malnutrition	Number of Cases	3,746	4,542	6,722	10,642	12,022
	Average incidence	8 per 10000	12/10000	13.3 /1000	21/1000	2 per 1000
	Incidence < 5 year	30 per 10000	49.7 per 1000	50 per 1000	14.1 per 1000	9.5 per 1000
	Incidence > 5 years	3 per 10000	3.9/10000	-	6.9/1000	-
Tuberculosis	Number of cases	2074	-	2420	2340	-
Meningitis	Number of cases	-	689	-	-	1361

Source: Ministère de la Santé, 1995.

Table 1.4: Distribution of the Five Leading Causes of Morbidity and Mortality (%) in Health Facilities in the Six Provinces of Bénin in 1993.

DISEASES --> PROVINCES ↓	Malaria		Acute Respiratory Infection		Diarrhoeal diseases		Trauma		Anemia	
	Morbid	Mortal	Morbid	Mortal	Morbid	Mortal	Morbid	Mortal	Morbid	Mortal
1. Atacora	34.7	18.5	15.6	3.3	11.8	3.3	5.3	0.7	1.7	1.3
2. Atlantique	33.4	15.4	11.5	0	5.7	15.4	4.2	15.4	7.3	15.4
3. Borgou	31.8	68.5	11.2	3.0	11.9	3.8	6.4	7.7	1.5	15.4
4. Mono	31.8	34.8	11.3	21.7	2.0	4.3	4.2	0	5.0	17.4
5. Oueme	34.6	35.7	10.2	7.1	5.1	0	5.9	0	6.9	7.1
6. Zou	30.1	35.4	13.7	8.9	10.6	8.9	5.8	6.3	3.3	13.9
BENIN	32.7	34.7	12.2	7.2	7.8	5.9	5.3	5.0	4.3	11.7

Table 1.5: Changes in Number of CHWs in Experimental Communes from 1990 to 1995

Experimental Communes	1990		1991		1992		1993		1994		1995	
	M	F	M	F			M	F	M	F	M	F
Agatogbo	13	12	12	14	12	14	11	14	11	14	11	14
Djougou2	7	8	6	6	6	5	8	8	8	8	8	8
Hevie	9	7	9	7	6	7	7	6	6	6	6	6
Paouignan	17	15	17	15	17	15	18	17	18	17	17	17
Sori	15	13	15	13	15	13	15	13	14	13	14	13
Takon	7	7	7	7	7	6	7	5	6	6	6	6
Total/sex	68	62	66	62	63	60	66	63	63	64	66	64
TOTAL	130		128		123		129		127		126	

M = male; F = female

## APPENDIX 2: QUESTIONNAIRES

### 2.1 Performance Analysis - (Questionnaire to CHWs)

1. Commune: ----- |\_\_|
2. Village: ----- |\_\_|
3. Community Health Worker (CHW) No. ----- |\_\_|
4. Age of the CHW: ----- |\_\_|
5. Number of years of schooling ----- |\_\_|
6. Number of years of experience as CHW: ----- |\_\_|
7. Annual amount of his/her household income: |\_\_|
8. Number of his/her dependents: ----- |\_\_|
9. Value of informal gift he/she got in 1995: --|\_\_|
10. Average number of supervision he/she received in 1995: |\_\_|
11. Number of retraining since the beginning of the programme: |\_\_|
12. Number of hours he/she is available a day: ----- |\_\_|
13. Amount of formal rewards he/she got in 1995: |\_\_|
14. Sex of CHW: ----- |\_\_|  
Female = 0; Male = 1
15. Marital status: ----- |\_\_|  
single=1; married=2; divorced=3; widowed=4; other=5.
16. Any employment? ----- |\_\_|  
yes=1; no=0
17. How do you appreciate in general the attitude of the villagers towards you as a CHW in 1995:  
positive = 1; otherwise = 0 ----- |\_\_|
18. How do you appreciate in general the way the district health system supported you as a CHW in 1995:  
good = 1; poor = 0 ----- |\_\_|
19. Any healing service before being CHW: ----- |\_\_|  
yes = 1; no = 0



20. What do you like in your role of CHW in your village?

-----  
 -----

21. What do you dislike in your role of CHW in your village? -----

-----

22. How does the supervisor appreciate the competence of the CHW:  
 (To ask the supervisor)

good = 1; poor = 0 -----|\_|

23. Total number of patients treated by the CHW in 1995:

----- |\_|\_|\_|

24. Number of presumptive malaria patients treated in 1995:

----- |\_|\_|\_|

PS:

- Question 22 is to be asked the supervisor;
- Answers to questions 23 and 24 are to get from the health centre routine data, or from the CHWs routine data, for each CHW.

2.2 Performance Analysis - Questionnaire to Households in Experimental Villages (with CHWs) - Cross Sectional Survey

1. Is there any PHC unit in your village? ----- |\_\_|

yes=1 no=0

If no STOP.

2. If yes, do you know or have you heard about the CHWs of your village? ----- |\_\_|

yes=1 no=0

If no STOP.

3. If yes, have you or any member of your household ever been treated for any diseases by him/her ?

yes=1 no=0 ----- |\_\_|

4. Have you or any member of your household ever been treated for malaria by him/her ?

yes=1 no=0 ----- |\_\_|

5. How do you appreciate his/her tasks as a CHW ? ----- |\_\_|

very good = 5

good = 4

fair = 3

poor = 2

very poor = 1

6. Do you think that he/she is useful to the village ? ----- |\_\_|

yes=1 no=0

7. Does he/she have any formal rewards from the villagers for that job?

yes=1 no=0 ----- |\_\_|

8. Does he/she get any informal present (material support) from the villagers for that job ?

yes=1 no=0 ----- |\_\_|

9. If no, what do you think the village can or should do to give him/her incentive to continue that job?

-----  
-----

10. From your own experience or what you have heard from your neighbours, is he/she available when needed ?

every time = 2 ----- {\_\_}  
 sometimes = 1  
 never = 0

11. Does the CHW have other responsibilities in the village?

yes=1 no=0 ----- {\_\_}

12. How do you agree with the followings as barriers/problems in the performance of the CHW tasks ?

strongly agree = 5  
 agree = 4  
 fair = 3  
 disagree = 2  
 strongly disagree = 1

12.1. CHW has inadequate knowledge and skills: ----- {\_\_}

12.2. CHW is not motivated due to lack of financial compensation:-{\_\_}

12.3. CHW is preoccupied with their own economic/employment activities-----{\_\_}

12.4. CHW is not accepted by villagers -----{\_\_}

12.5. Villagers are very busy with their activities and have no time to cooperate with him/her.-----{\_\_}

12.6. Villagers hardly see the benefits of the CHW -----{\_\_}

12.7. Others (specify).-----{\_\_}

13. From problems identified in 11, which one is the most inhibiting problem?  
 -----{\_\_}

2.3 Repeated Monthly Cross-Sectional Survey on Malaria Specific Morbidity and Mortality and the Treatment Seeking Behaviour

1. Commune of: -----|\_|\_|  
 with CHWs = 1  
 without CHWs = 2

2. Village: -----|\_|\_|

3. Household No.: -----|\_|\_|

4. No. of people in the household ?

< 1 year -----|\_|\_|

1-5 years -----|\_|\_|

5-15 years -----|\_|\_|

> 15 years -----|\_|\_|

5. Has any member of the household suffered from "fever only" in the last month ?

yes=1 no=0 -----|\_|

If no END.

6. If yes, who? -----

age: -----|\_|\_|

7. Was he/she treated?

yes=1 no=0 -----|\_|

8. If yes, Where? -----|\_|

CHWs = 1

health centre = 2

district hospital = 3

non medical treatment = 4

self treatment = 5

others (specify) = 6

9. If no, Why? -----

-----  
 -----  
 -----

10. As a consequence of the illness and if he/she has not been hospitalized (home illness),

- how many days of less work has he/she spent? ----- |\_\_|\_\_|

- how many days of no work at all has he/she spent? ----- |\_\_|\_\_|

11. If he/she has been hospitalized, for how long? ----- |\_\_|\_\_|

12. In case of treatment elsewhere different from CHW's, how did he/she go?

----- |\_\_|

on foot = 1

by your own bicycle (or a relative's) = 2

by taxi (bicycle, motorcycle, car...) = 3

others (specify) = 4

13. Has any relative gone with he/she to the health centre?

yes=1 no=0 ----- |\_\_|

If yes, How many ? ----- |\_\_|\_\_|

14. How much did he/she spend for transport to go there ?

----- |\_\_|\_\_|\_\_|\_\_|

15. How much did he/she spend for food during his/her stay at the health centre ?

----- |\_\_|\_\_|\_\_|\_\_|

16. How much did he/she spend for other needs to go there ?

----- |\_\_|\_\_|\_\_|\_\_|

17. How long it took for he/she to go and come back to the village?

----- |\_\_|\_\_|

18. How much did he/she spend for drugs there ?

----- |\_\_|\_\_|\_\_|\_\_|

19. Has any relative gone with he/she to the district hospital?

yes=1 no=0 ----- |\_\_|

20. How much did he/she spend for transport to go there ?

----- |\_\_|\_\_|\_\_|\_\_|\_\_|

21. How much did he/she spend for food during his/her stay at the health centre ?

----- |\_\_|\_\_|\_\_|\_\_|\_\_|

22. How much did he/she spend for other needs to go there ?

----- |\_\_|\_\_|\_\_|\_\_|\_\_|

23. How long it took for he/she to go and come back to the village?

----- |\_\_|\_\_|

24. If treatment at the district hospital, has he/she been hospitalized

yes=1 no=0 ----- |\_\_|

25. If yes, for how long? ----- |\_\_|\_\_|

26. How much did he/she spend for drugs there ?

----- |\_\_|\_\_|\_\_|\_\_|\_\_|

27. How much did he/she spend for other needs to go there ?

----- |\_\_|\_\_|\_\_|\_\_|\_\_|

28. Has any member of the household (or the neighbouring household) died in the last month ?

yes=1 no=0 ----- |\_\_|

29. What was the cause of the death according to you?

----- |\_\_|\_\_|

Table 3.1: Annualization Factors for Determining Annual Cost of Facilities and Equipment for Different Periods of Depreciation and Interest Rates

Lifetime of Assets (n)	Interest Rates (r)		
	5%	10%	15%
1	-	-	-
2	0.5378	0.5762	0.6151
3	0.3672	0.4021	0.4380
4	0.2820	0.3155	0.3503
5	0.2310	0.2638	0.2983
6	0.1970	0.2296	0.2642
7	0.1728	0.2054	0.2403
8	0.1547	0.1874	0.2229
9	0.1407	0.1736	0.2096
10	0.1295	0.1627	0.1993
11	0.1204	0.1540	0.1911
12	0.1128	0.1468	0.1849
13	0.1065	0.1408	0.1791
14	0.1010	0.1357	0.1747
15	0.0963	0.1315	0.1710
16	0.0923	0.1278	0.1679
17	0.0887	0.1247	0.1654
18	0.0885	0.1219	0.1632
19	0.0827	0.1195	0.1613
20	0.0802	0.1175	0.1598
21	0.0780	0.1156	0.1584
22	0.0760	0.1140	0.1573
23	0.0741	0.1126	0.1563
24	0.0725	0.1113	0.1554
25	0.0710	0.1102	0.1547
26	0.0696	0.1092	0.1541
27	0.0683	0.1083	0.1535
28	0.0671	0.1075	0.1531
29	0.0660	0.1067	0.1527
30	0.0651	0.1061	0.1523

$$\text{Annualization Formula: } a(rn) = \frac{[r(1+r)^n]}{[(1+r)^n - 1]}$$

Where: r = the rate of interest and  
n = the lifetime of asset for depreciation

Source: Henry M. Levin, Cost-Effectiveness: A Primer (Beverly Hills: Sage Publications, 1983), p.70

Table 3.2: Hypothetical Data for Multiple Regression Equation

# CHWs	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
1	115	25	3	3	110000	3	300	4	1	10	0
2	200	40	4	5	189000	4	1100	6	2	12	18000
3	310	37	5	5	200000	5	1000	11	3	12	24000
4	210	55	3	5	250000	7	0	7	2	12	12000
5	101	50	2	1	100000	8	0	5	1	4	0
6	212	53	8	5	350000	10	1400	7	2	8	12000
7	100	31	6	1	215000	8	200	5	1	10	0
8	95	28	4	1	175000	5	0	5	1	8	0
9	130	52	2	2	113000	7	100	7	1	12	0
10	112	42	7	1	82000	9	0	7	1	10	0
11	107	41	4	1	90000	4	0	6	1	10	0
12	350	53	7	5	210000	9	1300	12	3	12	27000
13	251	47	8	5	197000	3	500	10	2	12	15000
14	150	39	3	2	180000	12	0	8	1	8	5000
15	111	29	7	1	110000	4	0	8	1	10	0
16	101	27	8	1	100000	5	0	5	1	8	0
17	200	37	4	4	265000	7	0	8	2	12	14000
18	218	39	7	4	215000	4	0	7	2	10	17000
19	88	25	7	1	112000	3	0	3	0	8	0
20	97	30	3	1	117000	2	150	4	1	8	0
21	114	35	7	2	214000	1	700	7	1	8	0
22	104	28	3	2	200000	7	0	8	1	8	0
23	85	22	2	1	101000	2	0	4	0	4	0
24	99	39	9	1	150000	1	0	8	1	4	0
25	401	57	8	5	350000	4	1800	12	4	12	34500
26	200	37	4	4	265000	7	0	8	2	12	10000
27	350	65	0	5	199000	3	1200	11	3	12	26000
28	299	50	5	4	210000	3	0	11	3	10	22000
29	96	41	2	2	150000	4	1000	3	1	8	0
30	90	39	0	1	290000	7	0	2	1	8	0
31	138	30	4	4	110000	2	250	4	1	10	0
32	223	45	5	5	189000	3	1050	8	2	12	0
33	333	42	8	5	200000	4	450	11	3	12	12000
34	233	60	4	4	250000	8	0	7	2	12	12000
35	124	55	3	2	100000	5	1150	5	1	4	0
36	235	58	9	4	350000	9	1350	7	2	8	12000
37	110	38	7	2	215000	7	750	5	1	10	0
38	105	35	5	2	175000	4	250	5	1	8	0
39	140	59	3	2	113000	6	50	7	1	12	0
40	122	49	8	2	92000	8	0	7	1	10	0
41	117	48	5	4	90000	3	0	6	1	10	0
42	360	60	8	5	210000	8	1250	12	3	12	12000
43	244	45	9	4	197000	2	0	10	2	12	15000
44	143	37	4	1	180000	11	0	8	1	8	10000
45	104	27	8	2	110000	3	0	8	1	10	0
46	94	25	9	4	100000	4	0	5	1	8	0
47	193	35	5	3	265000	6	0	8	2	12	0
48	211	37	8	4	215000	3	0	7	2	10	14000
49	226	45	8	3	112000	2	50	3	0	8	0
50	98	31	4	3	117000	1	0	4	1	8	0
51	105	36	8	4	214000	0	0	7	1	8	0
52	122	41	4	2	200000	8	650	8	1	8	0
53	112	34	3	1	101000	1	0	4	0	4	0
54	93	28	10	2	150000	0	0	8	1	4	0
55	406	60	7	5	350000	3	1750	12	4	12	28000
56	205	40	5	3	265000	8	0	8	2	12	0
57	355	88	1	5	199000	2	1150	11	3	12	28000
58	304	53	6	4	210000	2	0	11	3	10	12000
59	101	44	3	3	150000	3	950	3	1	8	0
60	95	42	1	4	290000	6	0	2	1	8	0



Table 3.2: Hypothetical Data for Multiple Regression Equation (continued)

# CHWs	Y	X11	X12a	X12b	X12c	X13	X14	X15	X16	X17
1	115	1	1	0	0	1	1	1	1	0
2	200	1	0	1	0	1	1	1	1	0
3	310	1	0	1	0	1	1	1	1	1
4	210	1	0	1	0	1	1	1	1	0
5	101	0	0	1	0	1	0	1	0	0
6	212	1	0	1	0	1	1	1	1	0
7	100	1	0	1	0	0	0	1	0	0
8	95	0	1	0	0	0	0	0	1	0
9	130	1	0	1	0	1	1	1	1	1
10	112	1	0	1	0	1	1	1	1	0
11	107	0	0	1	0	1	1	1	1	0
12	350	1	0	1	0	1	1	1	1	1
13	251	1	0	1	0	1	1	1	1	0
14	150	1	0	1	0	1	1	1	1	1
15	111	1	0	1	0	1	1	1	1	0
16	101	0	0	1	0	0	0	0	0	0
17	200	1	0	1	0	1	1	1	1	0
18	218	1	0	1	0	1	1	1	1	0
19	88	0	1	0	0	0	0	0	0	0
20	97	0	1	0	0	0	1	1	1	0
21	114	1	0	1	0	1	1	1	1	0
22	104	1	0	1	0	1	1	1	1	0
23	85	0	1	0	0	0	0	0	0	0
24	99	0	0	0	1	1	1	1	1	0
25	401	1	0	1	0	1	1	1	1	1
26	200	1	0	1	0	1	1	1	1	0
27	350	1	0	0	0	1	1	1	1	1
28	299	1	0	1	0	1	1	1	1	0
29	96	1	0	1	0	1	1	0	1	0
30	90	0	0	1	0	0	1	1	1	0
31	138	1	1	0	0	1	1	1	1	0
32	223	1	0	1	0	1	1	1	1	0
33	333	1	0	1	0	1	1	1	1	1
34	233	1	0	1	0	1	1	1	1	0
35	124	0	0	1	0	1	0	1	1	0
36	235	1	0	1	0	1	1	1	1	0
37	110	1	0	1	0	0	0	1	1	0
38	105	0	1	0	0	0	0	0	1	0
39	140	1	0	1	0	1	1	1	1	0
40	122	1	0	1	0	1	1	1	1	0
41	117	0	0	1	0	1	1	1	1	0
42	360	1	0	1	0	1	1	1	1	1
43	244	1	0	1	0	1	1	1	1	0
44	143	1	0	1	0	1	1	1	1	0
45	104	1	0	1	0	1	1	1	1	0
46	94	0	0	1	0	0	0	0	1	0
47	193	1	0	1	0	1	1	1	1	0
48	211	1	0	1	0	1	1	1	1	0
49	226	0	1	0	0	0	0	0	0	0
50	96	0	1	0	0	0	1	1	1	0
51	105	1	0	1	0	1	1	1	1	0
52	122	1	0	1	0	1	1	1	1	0
53	112	0	1	0	0	0	0	0	1	0
54	93	0	0	0	1	1	1	1	1	0
55	406	1	0	1	0	1	1	1	1	1
56	205	1	0	1	0	1	1	1	1	0
57	355	1	0	0	0	1	1	1	1	1
58	304	1	0	1	0	1	1	1	1	0
59	101	1	0	1	0	1	1	0	1	0
60	95	0	0	1	0	0	1	1	1	0

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