End-line study

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REPORT

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"Capacitating Stakeholders in Using Climate Information for Enhanced Resilience in the Agricultural Sector in West Africa (CaSCIERA-TA)"

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Table of contents

Table of contents 2
1. Introduction 3
2. Methodologies 3
3. Main results 8
3.1 Niger 8
3.1.1 Socio economics characteristics 8
3.1.2 Climate risk awareness and coping mechanism 10
3.1.3 Effectiveness of local leaders to assist in time of crisis 13
3.1.4 Awareness of climate info, content, uncertainly 15
3.1.5 Access and use of climate info 18
3.2 Guinea 19
3.2.1 Socio economics characteristics 19
3.2.2 Climate risk awareness and coping mechanism 21
3.2.3 Effectiveness of local leaders to assist in time of crisis 24
3.2.4 Awareness of climate info, content, uncertainly 25
3.2.5 Access and use of climate info 28
3.3 Togo 29
3.3.1 Socio economics characteristics 29
3.3.2 Climate risk awareness and coping mechanism 31
3.3.3 Effectiveness of local leaders to assist in time of crisis 34
3.3.4 Awareness of climate info, content, uncertainly 35
3.3.5 Access and use of climate info 38
3.4 Benin 39
3.4.1 Socio economics characteristics 39
3.4.2 Climate risk awareness and coping mechanism 41
3.4.3 Effectiveness of local leaders to assist in time of crisis 44
3.4.4 Awareness of climate info, content, uncertainly 46
3.4.5 Access and use of climate info 49
4. Conclusion 50

1. Introduction

In the context of increasing climate variability and uncertainty, access to and use of reliable climate information to inform decisions in the agricultural sector are becoming instrumental to strengthen farmers' resilience to climate shocks. World Agroforestry Centre (ICRAF) and partners, Climate Change Agriculture and Food Security (CCAFS), AGRHYMET, California Academy of Sciences (CAS), « Institut National des Recherches Agricoles du Bénin » (INRAB), « Institut de Recherche Agronomique de Guinée » (IRAG), « Institut National de la Recherche Agronomique du Niger » (INRAN), « Institut Togolais de Recherche Agronomique » (ITRA), and national coordination unites component West African Agricultural Productivity Program (WAAPP) of the four countries involved (Bénin, Guinée, Niger and Togo), have implemented a project called "Capacitating Stakeholders in Using Climate Information for Enhanced Resilience in the Agricultural Sector in West Africa" (CaSCIERA-WA). The project was funded by CORAF through the regional coordination of WAAPP and by the four countries through the national coordination units of the WAAPP.

The monitoring, evaluation and learning component aimed at assessing the progress made by the various components of the project by comparing their final achievements measured by a set of indicators with a baseline situation of the same indicators to reveal the extent to which the project objectives have been reached. To this end, the baseline study consisting of establishing the critical situation before the project implementation was conducted in 2018. At the end of the project and according to the monitoring and evaluation plan, an end of project study was conducted from September to November 2019 within the four countries: Benin, Guinea, Niger and Togo. The present document reports the findings emanating from comparing the before and after situations for a certain number of variables. As only few variables have been considered, a more complete report of the full variables will be produced later.

2. Methodologies

Two tools were designed to collect data on the ground throughout the project sites. The first tool is a questionnaire for households' data collection. The second tool is a guideline for focus group discussion with resources persons identified in each village retained for baseline data collection.

The household questionnaire was formatted in ODK (open data kit) for electronic data collection with tablets. Data collected were sent to a server on ONA system.

Before using the tools for data collection in the selected villages, a test in randomly selected villages in each country was performed to correct potential errors and validate the tools. This pre-testing of the tools has also served capacitate the skills of the enumerators making them more comfortable with the tools.

The household questionnaire was about seven groups of monitoring indicators including:

- Households socio economic information;
- Climate risk awareness and coping mechanisms;
- Awareness of climate information, content and uncertainty;
- Access and use of climate information, early warning;
- Training on climate information;
- Behavioral changes and perceived impact;
- Household assets.

The focus group discussion guideline was centered around:

- Community climate change risks;
- Community access to climate and agricultural information;
- Communication about climate information;
- Gender and climate information access.

2.1. Sites selection and households sampling

During the baseline study, a randomly stratified sampling including villages of action (villages targeted for the project interventions) and non-action villages (villages where no action will be implemented by the project interventions) were used for data collection at the household level. The non-action villages were identified considering their similarities in household vulnerability, agro ecological conditions and economic development with the villages of action. They were meant to be located outside the area of influence of the project activities / interventions to avoid the effects of contamination. For the end of project we kept the same villages selected during the baseline study.

In a second step, households were randomly selected on the basis of the list of households. In each village, 50 households were selected. It was advised that 40% of respondents must be women if possible. We used the beneficiaries list for random selection of the household to be interviewed during this end of project evaluation study.

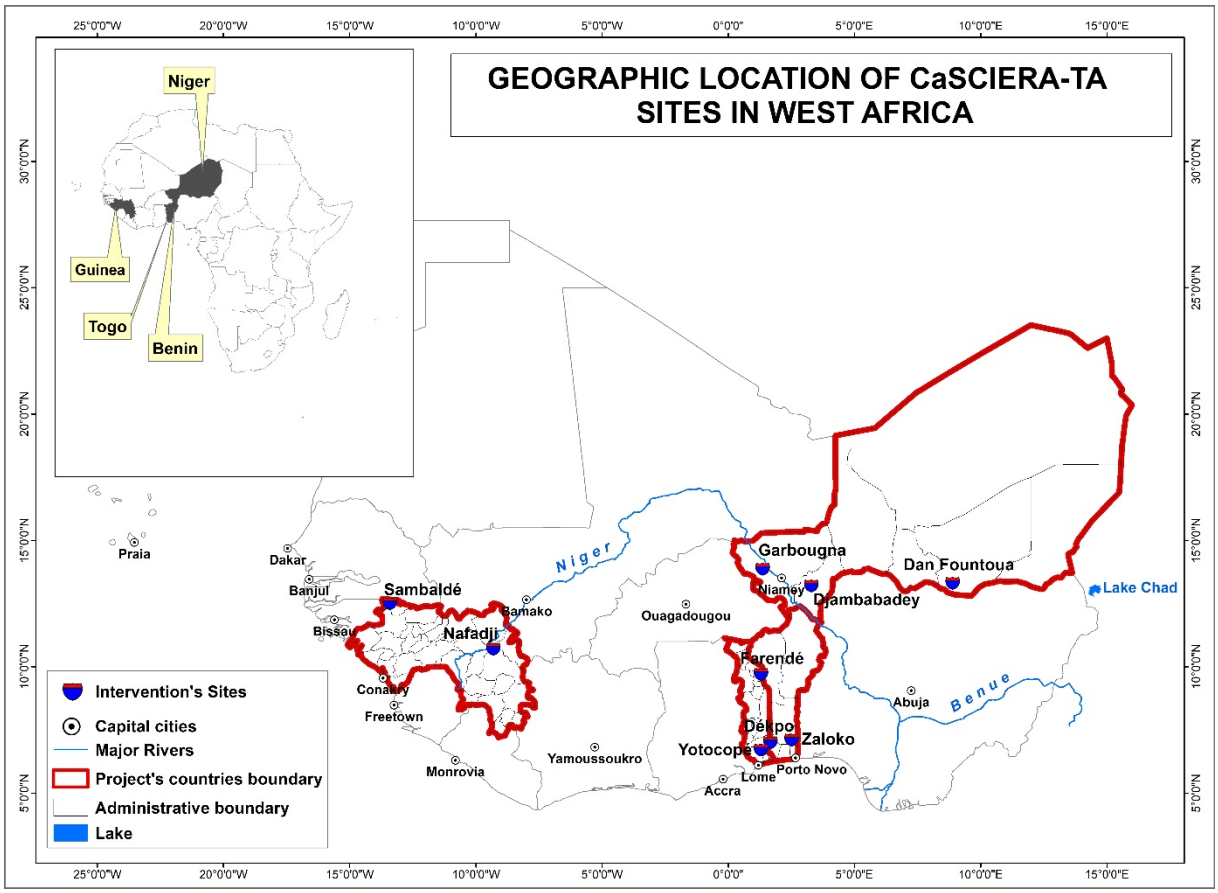

Figure 1: Locations of the intervention sites of CaSCIERA-TA project in the four West African countries

2.2. Data analysis: difference in difference (DiD) methodology

✓ Review of DiD Methodology

Simple pre- and post-treatment comparisons may be impacted by temporal trends in the outcome variable, or by other events that occurred between the two periods. To overcome this issue, using a quasi-experimental design, DiD can be used when two periods of data are available for the same treatment and comparison groups. The DiD estimator measures the treatment effect by looking at the difference between the average outcome in the control and treatment groups, before and after treatment.

✓ DiD Assumptions

A key assumption of DiD is known as the 'parallel trend' assumption, which supposes that in the absence of treatment, the average outcomes of the treatment group and the comparison

group would follow parallel paths over time. This allows DiD to account for unobserved variables, which are assumed to remain fixed over time.

- ✓ DiD Approach

In the simplest case, if two periods of data (0 and 1) are analyzed and treatment begins in between the two periods of time, the treatment effect can be identified by simply looking at outcomes before and after the treatment, and determine the effect as:

$$\bar{Y}_1 - \bar{Y}_0$$

Herein, $\bar{Y}_1$ is the mean outcome in the period following the treatment and $\bar{Y}_0$ is the mean outcome in the period prior to the commencement of the treatment. At this point, this can be called or thought of as a matching estimator where these actions match an entity (member) of the treatment group to it prior to receiving the treatment. For covariates that do not change over time, perfect balance is present whether or not those variables are included in the dataset.

The problem with this approach is that 'things' do change over time. Moreover, the effects of any other event that happened between the two periods are attributed to the treatment. Therefore, in order to account for changes over time, a second group is required. Assume one group, Group A, is administered the treatment between periods 0 and 1 (Let $\bar{Y}_{A1} - \bar{Y}_{A0}$ be the change in the outcome for this group), while a second group, Group B, does not receive the treatment at all (Let $\bar{Y}_{B1} - \bar{Y}_{B0}$ be the difference in outcome for that group).

Under the assumption that $\bar{Y}_{B1} - \bar{Y}_{B0}$ provides a good estimate of what would have happened to Group A if they had not received the treatment, the treatment effect can be worked out using the DiD estimate:

$$\hat{\alpha} = (\bar{Y}_{A1} - \bar{Y}_{A0}) - (\bar{Y}_{B1} - \bar{Y}_{B0}).$$

This approach can be formally justified with a fixed effects model.

Let $Y_{it} = \beta_0 + \alpha T_{it} + \delta t + \theta_i + \varepsilon_{it}$ where Y_{it} is the outcome for person i at time t, T_{it} indicates whether person i received the treatment at time t, t is time period (0 or 1) and θ_i is a person fixed effect. As long as $E(\varepsilon_{it}|G_i, t) = 0$ where G_i indicates the group type (either A or B). Then:

$$\hat{\alpha} \approx (E(Y_{it}|G_i=A,t=1) - E(Y_{it}|G_i=A,t=0)) - (E(Y_{it}|G_i=B,t=1) - E(Y_{it}|G_i=B,t=0))$$
$$= ([\beta_0+\alpha+\delta+E(\theta_{it}|G_i=A)] - [\beta_0+E(\theta_{it}|G_i=A)]) - ([\beta_0+\delta+E(\theta_{it}|G_i=B)] - [\beta_0+E(\theta_{it}|G_i=B)]) = (\alpha+\delta) - (\delta) = \alpha$$

In addition, this approach makes clear what key assumption justifies DiD. The sample analogue of the equation above yields:

$$\alpha\hat{} = \alpha + (\bar{\varepsilon}_{A1} - \bar{\varepsilon}_{A0}) - (\bar{\varepsilon}_{B1} - \bar{\varepsilon}_{B0})$$

Therefore, for consistency we need that:

$$E[(\bar{\varepsilon}_{A1} - \bar{\varepsilon}_{A0}) - (\bar{\varepsilon}_{B1} - \bar{\varepsilon}_{B0})] = 0$$

In practice, the DiD estimate can be obtained either as a simple DiD, by running the fixed effect regression above, or by running a regression of Y_{it} on T_{it}, t, and a dummy variable belonging to Group A. This can be further generalized to include more time periods (T), more groups (G), and additional covariates as one can run the regression

$$Y_{it} = X'_{it}\beta + \alpha T_{it} + D'_t\delta + G'_i\theta + \varepsilon_{it}$$

where X_{it} represents additional covariates, D_t is a $T \times 1$ vector of dummy variables indicating the time period and G_i is a $G \times 1$ vector of dummy variables indicating the group to which individual i belongs. That is D_t consists of a one in row t and zeros in all other rows while G_i consists of a one in the row corresponding to the group in which individual i belongs, and zeros in all other rows. Expanding this notion to nonlinear models of a linear index such as a logit or a negative binomial is straight forward.

3. Main results

3.1 Niger

3.1.1 Socio economics characteristics

The implementation sites for CaSCIERA actions in Niger were three: Dan Fountoua in Zinder region, Garbougna in Tillabery region and Djambabadey in Dosso region. The control sites for non-action were respectively Rouan Chabara, Bandio and Babiadey. In each site, 50 households were randomly selected for interviews. Thus, 300 households were interviewed in Niger. Among the interviewees by household during the baseline study, only 3 % were female despite the recommendation to have 40% (Table 1). This situation can be explained by sociological reasons which do not allow women to be exposed to such exercise of interviews. The average number of households' members was 9 with a minimum of 7 in Garbougna and a maximum of 11 in Rouan Chabara. The average education level of household head was 2 years. The mains income sources of were predominantly crop farming (74.3%) and both livestock rearing and crop farming for 25% of the households. Majority of the household was the owner of their farm (95%) with an average farm size of 5 ha.

The main crops produced in Niger sites were cowpea, millet and sorghum. Cowpea was produced by 89% of household while millet was produced by 82% and sorghum by 56%. All householda from Babiadey (100%) were cowpea producers (Table 1).

Table 1: Socio-economic characteristics of the sampled households in the sites for the baseline study in Niger

Variables	Babiadey (n=50)	Bandio (n=50)	Dan Fountoua (n=50)	Djambabadey (n=50)	Garbougna (n=50)	Rouan Chabara (n=50)	All (n=300)
Household characteristics							
Age of hh* head (year)	45.7 (16.1)	43.4 (14.3)	40.1 (14.5)	41.8 (15.9)	44.4 (14.3)	49.6 (14.6)	44.2 (15.2)
Gender of respondent (% male)	100	90	96	100	100	98	97
Household size	8 (3)	8 (4)	8 (4)	9 (5)	7 (4)	11 (5)	9 (4)
Household structure							
Mb<=17 year	3 (2)	2 (2)	4 (2)	4 (2)	2 (2)	5 (3)	3 (2)
Mb>64 years	1 (1)	0 (1)	0 (0)	1 (1)	1 (1)	1 (1)	1 (1)
Education of hh head (years)	1 (3)	1 (2)	2 (4)	2 (3)	2 (3)	1 (2)	2 (3)
Income sources							
Crop farming only (%)	94.0	74.0	42.0	98.0	80.0	58.0	74.3

Both livestock and crop (%)	6.0	24.0	58.0	0.0	20.0	42.0	25.0
Trade (%)	0.0	2.0	0.0	0.0	0.0	0.0	0.3
Other (%)	0.0	0.0	0.0	2.0	0.0	0.0	0.3
Farm characteristics							
Own Land (%)	100	90	98	100	80	100	95
Land size (ha)	4 (3)	6 (8)	4 (3)	4 (4)	6 (6)	6 (7)	5 (6)
Mains crop							
Cowpea (%)	100	68	86	96	84	98	89
Millet (%)	86	86	60	86	82	100	82
Sorghum (%)	22	18	88	20	42	92	56

Note: *hh refers to household; @Figures in parentheses are standard deviations.

During the end of project study in Niger, 299 households were interviewed with 30% of respondents being women (Table 2). This is closer to recommended 40% and might be an indication that the low percentage for the first study was not justified. Similarly to the baseline the average number of households' members was 9. The average education level was 1-year which is lower than 2 years of the baseline. The mains income sources of households were still crop farming only (66%). Surprisingly, millet (82%) was the main crop instead of cowpea during the baseline study (Table 2).

Table 2: Socio-economic characteristics of the sampled households in the sites for the end of project study in Niger

Variables	Babiadey (n=50)	Bandio (n=50)	Dan Fountoua (n=50)	Djambabadey (n=49)	Garbougna (n=50)	Rouan Chabara (n=50)	All (n=299)
Household characteristics							
Age of hh* head (year)	50.1 (14.7)	56.1 (13.6)	42.2 (11.7)	51.8 (11.4)	54.9 (10.9)	45.0 (12.5)	50.0 (13.4)
Gender of respondent (% male)	96	94	66	57	36	68	70
Household size	9 (5)	10 (6)	9 (4)	9 (3)	9 (4)	9 (5)	9 (4)
Household structure							
Mb<=17 year	3 (3)	3 (3)	6 (3)	3 (2)	2 (2)	5 (4)	4 (3)
Mb>64 years	1 (1)	0 (1)	0 (0)	0 (1)	0 (1)	0 (1)	0 (1)
Education of hh head (years)	1 (3)	1 (2)	1 (3)	1 (3)	1 (3)	1 (2)	1 (3)
Income sources							
Crop farming only (%)	70.0	88.0	40.0	9-.0	100.0	0.0	65.6
Livestock only (%)	0.0	0.0	0.0	0.0	0.0	2.0	0.3
Both livestock and crop (%)	18.0	4.0	60.0	0.0	0.0	98.0	30.1
Trade (%)	0.0	6.0	0.0	0.0	0.0	0.0	1.0
Other (%)	12.0	2.0	0.0	4.0	0.0	0.0	3.0
Farm characteristics							
Own Land (%)	98	96	100	100	100	90	97
Land size (ha)	5 (7)	7 (13)	2 (2)	6 (6)	6 (4)	6 (16)	5 (9)
Mains crop							

Cowpea (%)	88	94	28	0	98	80	65
Millet (%)	86	86	60	86	82	100	82
Sorghum (%)	22	18	88	20	42	92	56

3.1.2 Climate risk awareness and coping mechanisms

For climate risk awareness, a certain number of questions were administered to farmers of implementation sites (Dan Fountoua, Garbougna and Djambabadey) and control sites (Rouan Chabara, Bandio and Babiadey). Among these questions, the first one was to know if farmers have heard about climate change. It turned out that 31% of the interviewees of the implementation sites and 35% of the control had not heard at all about climate change (Figure 1) as opposed to 15% and 23%, respectively (Figure 1). To fight something, you must first hear or know it.

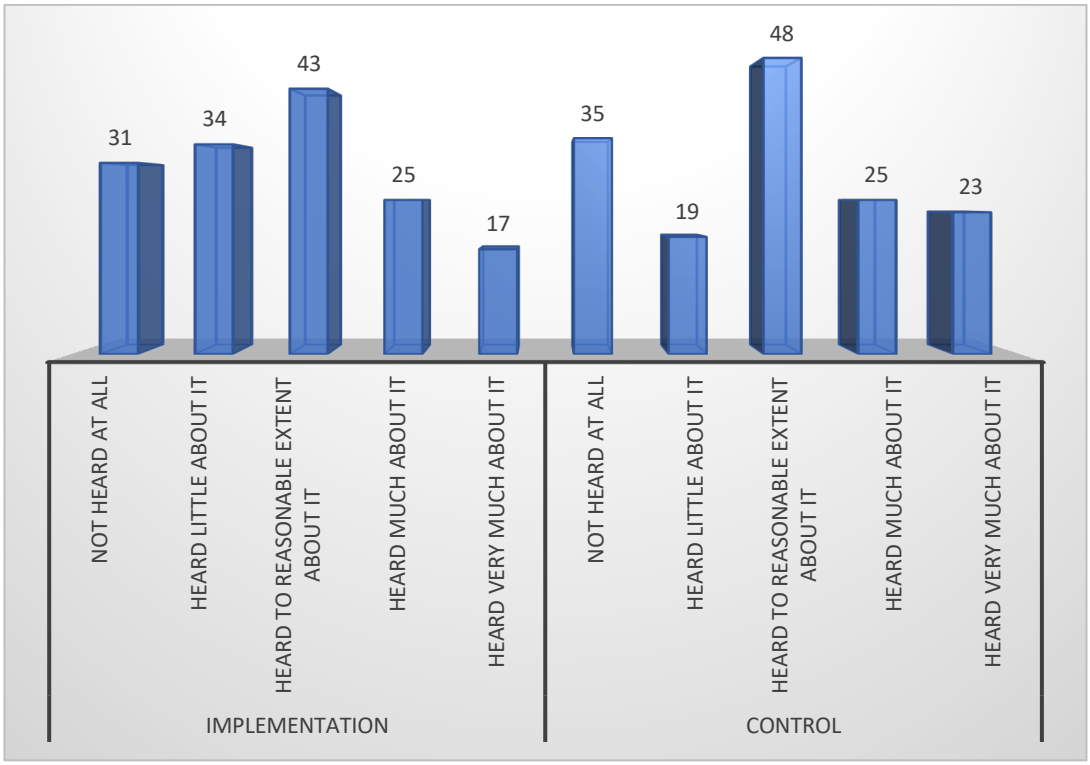

Figure 1: Awareness about climate change in study sites in Niger

Using the difference in difference method at the end of the project revealed no change among people who had not been exposed to climate change concept at the start both in the implementation site as well as in the control site (Table 3). However, in the intervention site, a non-statistically significant increase of 8% was observed for interviewees knowledgeable about climate change whereas in the control site there was slight again non-significant decrease of 5%.

Table 3: Difference in difference values for awareness about climate change in Niger

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=150)	Endline (n=149)	P value	Baseline (n=150)	Endline (n=150)	P value	
Climate change hearing							
Not heard at all	21%	21%	0.77	23%	24%	0.70	1%
Heard much about it	28%	36%	0.50	32%	27%	0.56	13%

The notion of climate change can be ambiguous. For this reason, some questions were related to the climate risks or events. Thus, on the perception of the variation of the number of rainfall days, they were 95% from implementation site and 93% from control sites who believe that number has significantly decreased over the last 30 years in their areas (Table 4). The figures were respectively 96% and 91% who have observed a significant increase in the number of dry spells within seasons. Values of the same magnitude were mentioned for the frequency and severity of droughts and the number of hot days. While the frequency of floods did not change over the last 30 years for 61% and 33% of the interviewees of the implementation and control sites, their severity has significantly increased

The mains climate risks are erratic rainfall (96%), significant increase in temperature and drought or windstorm (79%) in implementation sites. In control sites, drought (95%), erratic rainfall (92%) and increase in temperature (64%) were mentioned by the farmers (Table 4).

Table 4: Climate risks affecting livelihood options (crops, livestock and others) as perceived by farmers of the study sites in Niger during the last 5 years

Climate risks	**Implementation sites (%)**	**Control sites (%)**
Drought	79	95
Floods	52	14
Erratic rainfall	96	92
Significant increase in temperature	85	64
Significant decrease in temperature	13	7
Landslides	1	1
Windstorm	79	61
Hail (Rain with storms)	10	0
Soil erosion	54	35

At endline study, drought as climate risk for farmers decreased from 79% to 72% in implementation sites while it also decreased from 95% to 69% in control site. The DiD is negative and that means the intervention impact was not significative for drought as climate risk. For all the others risks (floods, erratic rainfall, significant increase in temperature, windstorm and soil erosion), the DiD is positive. This means that the intervention had a significant impact in implementation sites comparative to control sites for these climate risks (Table 5).

Table 5: Difference in difference values for climate risks affecting livelihood options (crops, livestock and others) as perceived by farmers of the study sites in Niger during the last 5 years

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=150)	Endline (n=149)	Baseline (n=150)	Endline (n=150)	
Climate risks					
Drought	79%	72%	95%	69%	-19%
Floods	52%	87%	14%	58%	9%
Erratic rainfall	96%	68%	92%	87%	23%
Significant increase in temperature	85%	71%	64%	67%	17%
Windstorm	79%	56%	61%	57%	19%
Soil erosion	54%	38%	35%	69%	50%

To prevent climate risks, the majority of the farmers have no solution. Indeed, they were 59% from implementation site and 61% from control sites doing nothing to prevent drought. The values were 42% and 11% for previnting floods, 81% and 58% erratic rainfall, respectively (Table 6). However, 7% of farmers from control sites were using drought tolerant varieties and 3% were planting trees to fight against drought.

Table 6: Percentage of interviewees adopting preventive measures against climate risks affecting livelihood options (crops, livestock and others) in the study sites in Niger

Climate risks prevention	Implementation sites (%)	Control sites (%)
Drought	59	61
Floods	42	11
Erratic rainfall	81	58
Significant increase in temperature	80	49
Soil erosion	43	25

The end of project analysis revealed for farmers who did not use anything to prevent climate risks positive DiD values for erratic rainfall and soil erosion and negative ones for drought, floods, and increase in temperature (Table 7). Thus, project interventions have significantly impacted farmers in engaging in actions to prevent erratic rainfall and soil erosion as opposed to preventing drought, floods, significant increase in temperature.

Table 7: Difference in difference values for the percentage of interviewees adopting preventive measures against climate risks affecting livelihood options (crops, livestock and others) in the study sites in Niger

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=150)	Endline (n=149)	Baseline (n=150)	Endline (n=150)	
Climate risks prevention (Nothing is done)					
Drought	59%	59%	61%	36%	-25%
Floods	42%	82%	11%	27%	-24%
Erratic rainfall	81%	66%	58%	55%	12%
Significant increase in temperature	80%	68%	49%	34%	-3%
Soil erosion	43%	26%	25%	28%	20%

3.1.3 Effectiveness of local leaders to assist in time of crisis

The effectiveness of local leaders to assist in time of crisis assess the existence of crisis comity and the capacity of local leaders to assist community on climate change problems. The study results revealed a total disagreement of the population about the capacity of local leaders and groups to help the community in case of climate risks (Table 9). Indeed, most of interviewees did not expect any assistance from the local leaders, local governments or community group in case of climate shocks. The percentage of those who believe in rescue action from these entities ranges from 1 to 34% (Table 8).

Table 8: Percentage of interviewees believing in the effectiveness of local institutions and mechanisms to provide appropriate assistance in case of crisis in the study sites in Niger

Assistance in time of crisis (Agree)	Implementation sites (%)	Control sites (%)
In times of climate hazards or in the face of climate related changes, I trust that my local government will do what is necessary to provide adaptation options/farm support to local households	28	34

These days, leaders and groups in my community are able to sort out problems in times of drought/flood	23	32
If a serious drought/flood were to take place in my local area in the future I am confident that my local government would provide me with the support I needed in good time.	21	28
These days, leaders in my community do a good job in ensuring that the basic needs of members of my community are met during times of drought/flood.	15	26
Representatives from my households are regularly invited to participate in important meetings related to the management of climate shocks in our community.	26	21
Have you ever heard of any community disaster risk prevention or community relief actions that the local community/leaders are implementing to assist the community in times of crisis?	1	7
Are you aware of any actions that the local community/leaders are undertaking to help the community better cope or adapt to climate shocks?	1	3

The DiD for effectiveness of local leaders to assist in time of crisis were all positive, except for two parameters (Table 9). Overall, the project seems to have raised awareness of the farmers about the local institutions and mechanisms to fight climate risks and shocks.

Table 9: Difference in difference values for the percentage of interviewees believing in the effectiveness of local institutions and mechanisms to provide appropriate assistance in case of crisis in the study sites in Niger

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=150)	Endline (n=149)	Baseline (n=150)	Endline (n=150)	
Assistance in time of crisis (Agree)					
Climate hazards or in the face of climate related changes, I trust local government assistance	28%	54%	34%	31%	29%
Leaders and groups in my community are able to sort out problems in times of drought/flood	23%	51%	32%	31%	29%
Serious drought/flood were to take place in my local area in the future I am confident that my local government would provide me with the support	21%	41%	28%	28%	20%
These days, leaders in my community do a good job in ensuring that the basic needs of members of my community are met during times of drought/flood	15%	46%	26%	30%	27%

Representatives from my households are regularly invited to participate in important meetings related to the management of climate shocks in our community.	26%	74%	21%	33%	36%
Ever heard of any community disaster risk prevention or community relief actions that the local community/leaders are implementing to assist the community in times of crisis	1%	3%	7%	22%	-13%
Aware of any actions that the local community/leaders are undertaking to help the community better cope or adapt to climate shocks	1%	1%	3%	19%	-16%

3.1.4 Awareness of climate information, content, uncertainly

The main approach promoted through the project CaSCIERA-TA is Participatory Integrated Climate Services for Agriculture (PICSA). The objective of the PICSA approach is to help producers make appropriate decisions based on current and historical climate and meteorological information specific to their communities for the best fit livelihood options (agriculture, livestock and others).

Only a little percentage of farmers had heard about climate information in the two types of sites (implementation and control). Indeed, they were only 13% from implementation site and 15% from control sites who heard about seasonal forecasts; 24% and 31% about short term forecasts, 29% and 22% about historical climate information, most surprising only 9% and 15% from about indigenous forecasts, respectively (Figure 2).

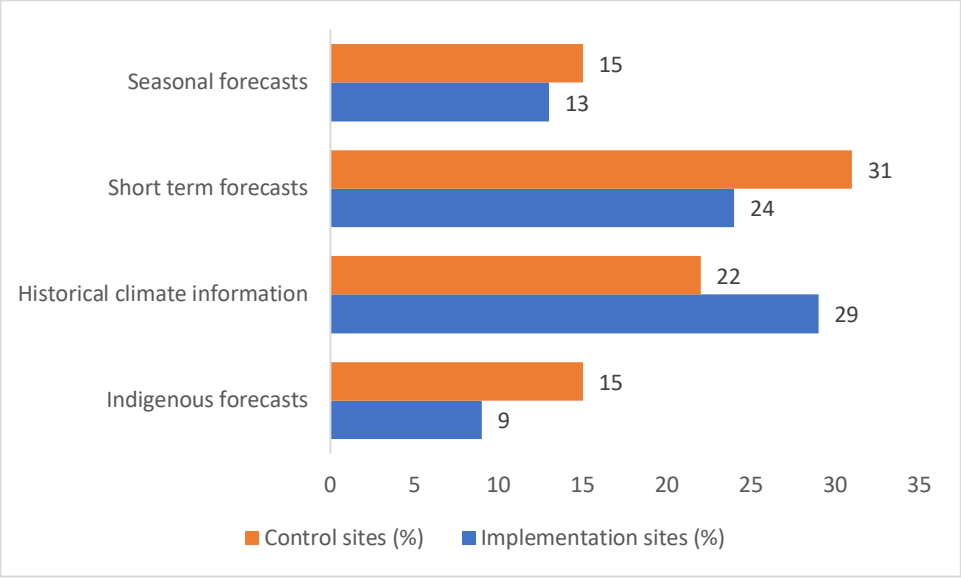

Figure 2: Percentage of interviewees aware of various types of climate information in the study sites in Niger

The endline study showed that the rate of farmers who had heard about climate info increased for all types of climate information but that increase was only significant for indigenous forecast based on DiD values (Table 10).

Table 10: Difference in difference values for the percentage of interviewees aware of various types of climate information in the study sites in Niger

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=150)	Endline (n=149)	Baseline (n=150)	Endline (n=150)	
Awareness of climate information, content and uncertainty					
heard about					
Indigenous forecasts	9%	58%	15%	50%	14%
Historical climate information	29%	42%	22%	36%	-1%
Short term forecasts	24%	42%	31%	57%	-8%
Seasonal forecasts	13%	42%	15%	49%	-5%

As a consequence of low awareness about climate information, lower percentage of interviewees have received it (Figure 3). Indeed, they were 13% from implementation site and 15% from control sites who heard about seasonal forecasts, but they were 5% and 9% who received seasonal forecasts, respectively (Figure 3). The project actions do seem to have changed that situation as shown in table 11.

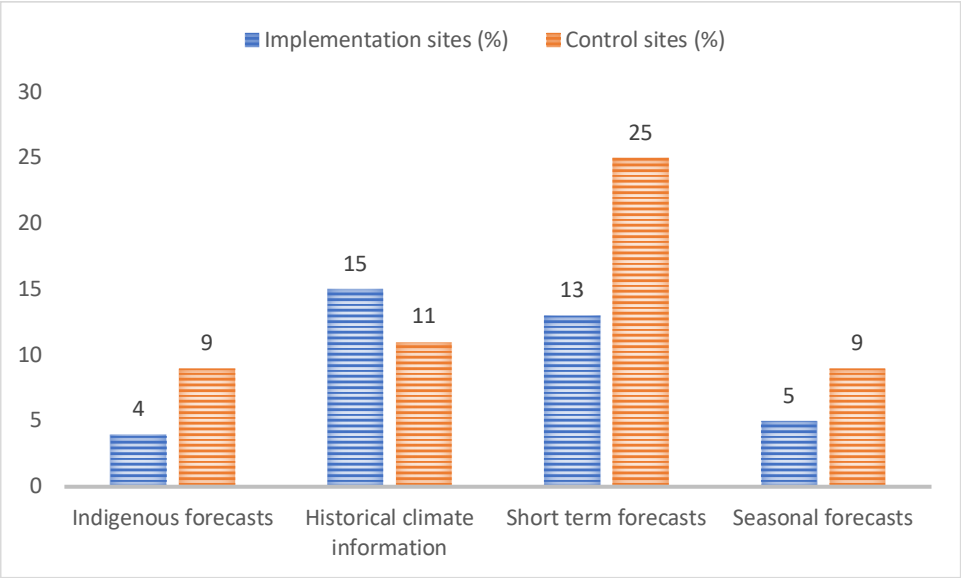

Figure 3: Percentage of interviewees who received climate information in the study sites in Niger

Table 11: Difference in difference values for the percentage of interviewees who received climate information in the study sites in Niger

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=150)	Endline (n=149)	Baseline (n=150)	Endline (n=150)	
Awareness of climate information, content and uncertainty					
Received					
Indigenous forecasts	4%	41%	9%	45%	1%
Historical climate information	15%	32%	11%	31%	-3%
Short term forecasts	13%	29%	25%	47%	-6%
Seasonal forecasts	5%	31%	9%	39%	-4%

In Africa, farmers are not familiar with climate information and that might be due to the high uncertainty associated with it making it of little relevance for the farmers, who may be inclined to ignore its existence. In Niger sites, the situation is almost similar for both categories of sites as a very low percentage of farmers trusted climate information. The highest percentage was observed in control sites for short term forecast with 10% (Table 12). According to farmers, the two best lead time are weeks before or months before.

Table 12: Percentage of interviewees who trust climate information in the study sites in Niger

Climate information trust (high)	Implementation sites (%)	Control sites (%)
Indigenous forecasts	1	2
Historical climate information	3	3
Short term forecasts	5	10
Seasonal forecasts	1	4

The end of project assessment revealed that more farmers trust all types of climate information but the DiD of short-term forecast was negative and that of indigenous forecast zero (Table 13).

Table 13: Difference in difference values for the percentage of interviewees who trust climate information in the study sites in Niger

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=150)	Endline (n=149)	Baseline (n=150)	Endline (n=150)	
Awareness of climate information, content and uncertainty					
Trust					
Indigenous forecasts	1%	25%	2%	26%	0%
Historical climate information	3%	28%	3%	23%	5%
Short term forecasts	5%	23%	10%	33%	-5%
Seasonal forecasts	1%	26%	4%	28%	1%

3.1.5 Access and use of climate information

The assessment of the listening to educational radio programs on climate and agriculture that include dramas, phone-in discussions, expert talking, farmers' interviews by interviewed farmers was conducted with the aim to identify the best channel to disseminate climate information. In our sites, 37% of farmers from implementation sites and 45% from control sites declared having access to information from radio broadcast but during the end of the project assessment, these have decreased. The values for attending a training on climate information were11% and 4%, respectively and these values have increased by the end of the project with positive DiD (Table 14).

Table 14: Difference in difference values for the percentage of interviewees who have access to climate information in the study sites in Niger

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=150)	Endline (n=149)	Baseline (n=150)	Endline (n=150)	
Training on climate information					
Listening radio program	37%	23%	45%	35%	-4%
Attended to a training	11%	53%	4%	9%	37%

Using climate information for decision making in cropping options is intended to either stabilize the yield (less variability) or increase it. In Niger, we got a negative DiD for millet and cowpea which are the main crops.

Table 15: Difference in difference values for crop yield in the study sites in Niger

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=150)	Endline (n=149)	Baseline (n=150)	Endline (n=150)	
Yield					
Millet	827	132,1	241,2	51,3	-505
Cowpea	88,6	71,6	30	24,8	-11,8

3.2 Guinea

3.2.1 Socio economics characteristics

The implementation sites for CaSCIERA actions in Guinea were two: Nafadji Centre in Kankan region, and Sambalde in Boke region. The control sites with no intervention of the project were respectively Fodecariah and Missira. In each site, 50 household were randomly selected for interviews, but we have 51 households interviewed in Nafadji Centre. Thus, 201 households were interviewed in Guinea. Among the interviewees, only 13 % were female despite the recommendation to have 40%. The average number of households' members was 12 with a minimum of 7 in Sambalde and a maximum of 16 in Fodecariah (Table 16). The average education level of household head was 1 year. The mains income sources were crop farming only (53.7%) and both livestock and crop for 38.8% of the households. Majority of the household was the owner of their farm (95%) with an average size of 11 ha.

The main crops produced in Guinea sites were rice, maize and cassava. Rice was produced by 77% of household while maize was produced by 50% and sorghum by 15%. Several other cereals are produced by a few numbers of households (Table 16).

Table 16: Socio-economic characteristics of the sampled households in the sites for the baseline study in Guinea

Variables	Fodecariah (n=50)	Missira (n=50)	Nafadji Centre (n=51)	Sambalde (n=50)	All (n=201)
Household characteristics					
Age of hh* head (year)	53.4 (13.9)	50.5 (17.8)	51.8 (14.3)	49.9 (13.5)	51.4 (14.9)
Gender of respondent (% male)	88	82	86	90	87
Household size	16 (6)	8 (4)	15 (7)	7 (3)	12 (7)
Household structure					
Mb<=17 year	7 (3)	3 (2)	7 (4)	3 (2)	5 (3)
Mb>64 years	1 (1)	0 (1)	1 (1)	0 (1)	1 (1)
Education of hh head (years)	0 (1)	1 (2)	2 (3)	2 (3)	1 (3)
Income sources					
Crop farming only (%)	26.0	72.0	70.5	46.0	53.7
Livestock farming only (%)	2.0	0.0	2.0	0.0	1.0
Both livestock and crop (%)	72.0	12.0	27.5	44.0	38.8
Trade (%)	0.0	4.0	0.0	0.0	1.0
Other (%)	0.0	12.0	0.0	10.0	5.5
Farm characteristics					
Own Land (%)	100	98	98	86	95
Land size (ha)	18 (14)	5 (8)	11 (11)	10 (7)	11 (11)
Mains crop					
Rice (%)	86	76	78	68	77
Maize (%)	84	4	82	30	50
Cassava (%)	48	0	14	0	15

Two-hundred households comprising 28% women were interviewed for the end of project assessment. The average number of households' members was 14 higher than the 12 of the baseline. Similar trend was observed with the average education level with 2 years versus 1 for baseline. The main income source of households has remained crop farming (46%) and rice (79%) the main crop (Table 17).

Table 17: Socio-economic characteristics of the sampled households in the sites for the end of project study in Guinea

Variables	Fodecariah (n=50)	Missira (n=50)	Nafadji Centre (n=50)	Sambalde (n=50)	All (n=200)
Household characteristics					
Age of hh* head (year)	54.4 (12.9)	48.6 (13.9)	55.2 (12.0)	45.8 (14.0)	51.0 (13.7)
Gender of respondent (% male)	94	92	60	42	72
Household size	19 (7)	8 (4)	20 (7)	8 (5)	14 (8)
Household structure					
Mb<=17 year	8 (4)	3 (2)	8 (4)	3 (2)	6 (4)
Mb>64 years	1 (1)	0 (1)	2 (1)	0 (1)	1 (1)
Education of hh head (years)	1 (3)	2 (4)	1 (2)	3 (4)	2 (3)
Income sources					
Crop farming only (%)	46.0	52.0	38.0	50.0	46.5

Livestock farming only (%)	2.0	2.0	0.0	0.0	1.0
Both livestock and crop (%)	44.0	30.0	54.0	48.0	44.0
Trade (%)	6.0	0.0	0.0	0.0	1.5
Other (%)	2.0	16.0	8.0	2.0	7.0
Farm characteristics					
Own Land (%)	96	98	100	96	97
Land size (ha)	11 (9)	5 (7)	15 (11)	7 (6)	9 (9)
Mains crop					
Rice (%)	76	96	72	70	79
Maize (%)	82	14	68	12	43
Peanut (%)	28	50	36	100	54
Cassava (%)	28	0	10	2	10

3.2.2 Climate risk awareness and coping mechanism

The results were that 27% from implementation sites and 48% from control sites know nothing about climate change as opposed 32% and 36%, respectively (Figure 4).

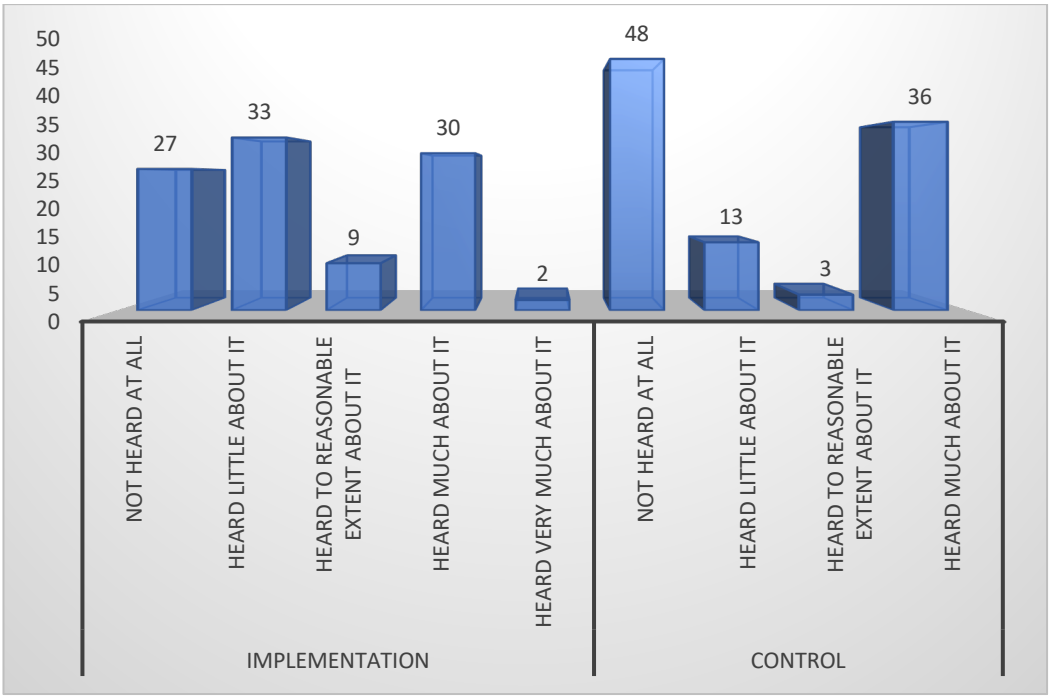

Figure 4: Awareness about climate change in study sites in Guinea

The difference in difference between endline study and baseline study for farmers who had hearing about climate change was positive for who had not heard at all and heard much about it. This means that CaSCIERA project have had an impact on this aspect in Guinea.

Table 18: Difference in difference values for awareness about climate change in study sites in Guinea

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=100)	P value	Baseline (n=100)	Endline (n=100)	P value	
Climate change hearing							
Not heard at all	27%	25%	0.77	48%	61%	0.03	15%
Heard much about it	30%	15%	0.00	36%	7%	0.00	14%

For 96% of the interviewees from implementation sites and 94% from control sites, the number of rainfall days has significantly decreased over the last 30 years in their areas. Values of the same magnitude were mentioned for increase in the number of drought spells, number of hot days, frequency and severity of drought. The frequency of flood did not change over the last 30 years for 19% from implementation site and 11% from control sites contrary to its severity which has increased for 25% and 13% of the interviewees respectively.

The mains climate risks are drought (98%), erratic rainfall (96%), significant increase in temperature (70%) according to farmers from implementation sites as well as in the control sites with 90%, 92%, 70%, respectively (Table 19).

Table 19: Climate risks affecting livelihood options (crop, livestock and others) as perceived by farmers of the study sites in Guinea during the last 5 years

Climate risks	Implementation sites (%)	Control sites (%)
Drought	98	90
Floods	20	7
Erratic rainfall	96	92
Significant increase in temperature	70	68
Significant decrease in temperature	16	3
Landslides	7	0
Windstorm	45	36
Hail (Rain with storms)	22	27
Soil erosion	8	2

In Guinea, the climate risks perception was almost the same between endline and baseline. The DiD was positive for drought, null for erratic rainfall and negative for increase in temperature (Table 20).

Table 20: Difference in difference values for climate risks affecting livelihood options (crop, livestock and others) as perceived by farmers of the study sites in Guinea during the last 5 years

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=100)	P value	Baseline (n=100)	Endline (n=100)	P value	
Climate risks							
Drought	98%	80%	0.00	90%	80%	0.04	8%
Erratic rainfall	96%	80%	0.00	92%	76%	0.00	0%
Significant increase in temperature	70%	76%	0.00	68%	69%	0.67	-5%

Except for the erratic rainfall in the control villages (54%), less than of the interviewees have developed preventive measures against climate risks affecting their livelihood options in Guinea (Table 21). Other critical risks which come as second in the rank in terms of percentage of farmers engaged in preventing them include increase in temperature and drought whereas floods and soil erosion to have engaged less people in these preventive actions (Table 21).

Table 21: Percentage of interviewees adopting preventive measures against climate risks affecting livelihood options (crop, livestock and others) in the study sites in Guinea

Climate risks prevention	Implementation sites (%)	Control sites (%)
Drought	24	36
Floods	10	3
Erratic rainfall	36	54
Significant increase in temperature	31	48
Soil erosion	1	2

For preventive measures, all DiD values were negative for all the risks in Guinea (Table 22) and that is so despite 62% of interviewees of implementation sites and 33% of control sites mentioned planting trees to fight against drought while some were changing cropping date (37% and 28%, respectively), crop type (27% and 15%, respectively), drought tolerant varieties (21% and 14%, respectively). In some circumstances, same households resorted to multiple methods to prevent the multiple risks.

Table 22: Difference in difference values for the percentage of interviewees adopting preventive measures against climate risks affecting livelihood options (crop, livestock an dothers) in the study sites in Guinea

	Implementation	Control	

Parameters	Baseline (n=100)	Endline (n=100)	P value	Baseline (n=100)	Endline (n=100)	P value	Difference in difference estimate)
Climate risks prevention (Nothing is done)							
Drought	24%	22%	0.80	36%	23%	0.03	-11%
Floods	10%	25%	0.00	3%	7%	0.70	-11%
Erratic rainfall	36%	26%	0.03	54%	27%	0.00	-17%
Significant increase in temperature	31%	23%	0.08	48%	28%	0.00	-12%
Soil erosion	1%	8%	0.62	2%	7%	0.55	-2%

3.2.3 Effectiveness of local leaders to assist in time of crisis

The trust in the local institutions or mechanisms to assist in periods of climatic crisis is low with values raging from o to 14% (Table 23). These values indicate the need for action in that direction but also the huge task ahead for change.

Table 23: Percentage of interviewees believing in the effectiveness of local institutions and mechanisms to provide appropriate assistance in case of crisis in the study sites in Guinea

Assistance in time of crisis (Agree)	Implementation sites (%)	Control sites (%)
In times of climate hazards or in the face of climate related changes, I trust that my local government will do what is necessary to provide adaptation options/farm support to local households	12	8
These days, leaders and groups in my community are able to sort out problems in times of drought/flood	13	5
If a serious drought/flood were to take place in my local area in the future I am confident that my local government would provide me with the support I needed in good time.	14	7
These days, leaders in my community do a good job in ensuring that the basic needs of members of my community are met during times of drought/flood.	12	8
Representatives from my households are regularly invited to participate in important meetings related to the management of climate shocks in our community.	14	5
Have you ever heard of any community disaster risk prevention or community relief actions that the local community/leaders are implementing to assist the community in times of crisis?	3	2
Are you aware of any actions that the local community/leaders are undertaking to help the community better cope or adapt to climate shocks?	0	0

Positive impact was observed for "Representatives from my households are regularly invited to participate in important meetings related to the management of climate shocks in our community" with DiD value of 17%. Values of DiD for other parameters are either marginal (1) or negative (Table 24).

Table 24: Difference in difference values for the percentage of interviewees believing in the effectiveness of local institutions and mechanisms to provide appropriate assistance in case of crisis in the study sites in Guinea

	Implementation		Control		
Parameters	Baseline (n=100)	Endline (n=100)	Baseline (n=100)	Endline (n=100)	Difference in difference estimate)
Assistance in time of crisis (Agree)					
climate hazards or in the face of climate related changes, I trust local government assistance	12%	6%	8%	5%	-3%
leaders and groups in my community are able to sort out problems in times of drought/flood	13%	8%	5%	6%	-6%
serious drought/flood were to take place in my local area in the future I am confident that my local government would provide me with the support	14%	6%	7%	5%	-6%
These days, leaders in my community do a good job in ensuring that the basic needs of members of my community are met during times of drought/flood	12%	7%	8%	6%	-3%
Representatives from my households are regularly invited to participate in important meetings related to the management of climate shocks in our community.	14%	31%	5%	5%	17%
ever heard of any community disaster risk prevention or community relief actions that the local community/leaders are implementing to assist the community in times of crisis	3%	2%	2%	0%	1%
aware of any actions that the local community/leaders are undertaking to help the community better cope or adapt to climate shocks	0%	1%	0%	0%	1%

3.2.4 Awareness of climate information, content, uncertainly

Only a little percentage of farmers had heard about climate information in the two types of sites (implementation and control). Indeed, the percentages are all lower than 14% for all types information in the two types of sites (Figure 5).

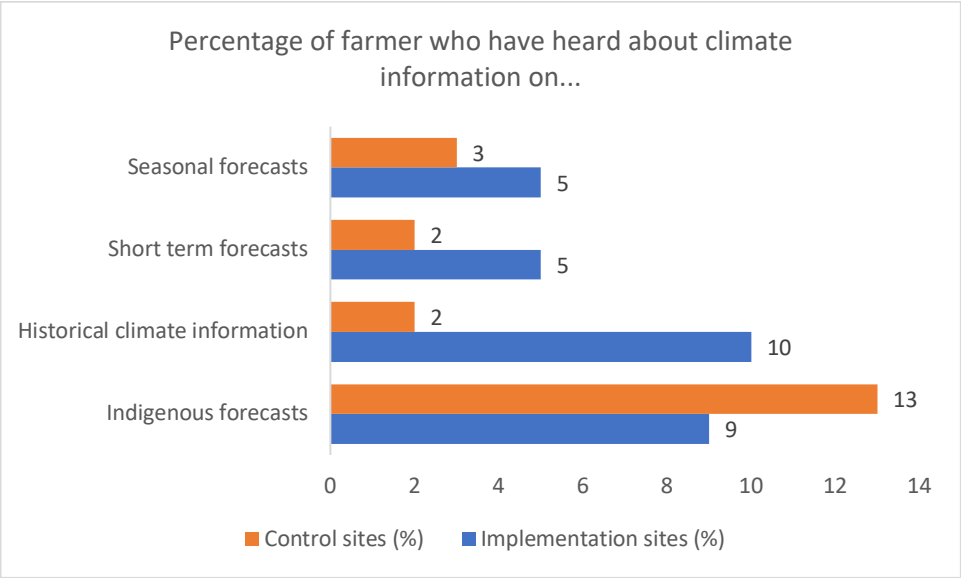

Figure 5: Percentage of interviewees aware of various types of climate information in the study sites in Guinea

The impact of CaSCIERA in Guinea on awareness of climate information was positive for all climate information about hearing. Indeed, the DiD was positive for indigenous forecast, historical climate information, short term forecasts and seasonal forecasts (Table 25).

Table 25: Difference in difference values for the percentage of interviewees aware of various types of climate information in the study sites in Guinea

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=100)	P value	Baseline (n=100)	Endline (n=100)	P value	
Awareness of climate information, content and uncertainty							
heard about							
Indigenous forecasts	9%	34%	0.00	13%	14%	0.60	24%
Historical climate information	10%	34%	0.01	2%	10%	0.55	16%
Short term forecasts	5%	33%	0.00	2%	12%	0.06	18%
Seasonal forecasts	5%	46%	0.00	3%	11%	0.11	33%

When we considered who had received climate information, the rate became low than who had heard with the values ranging between 1 and 6 (Figure 6).

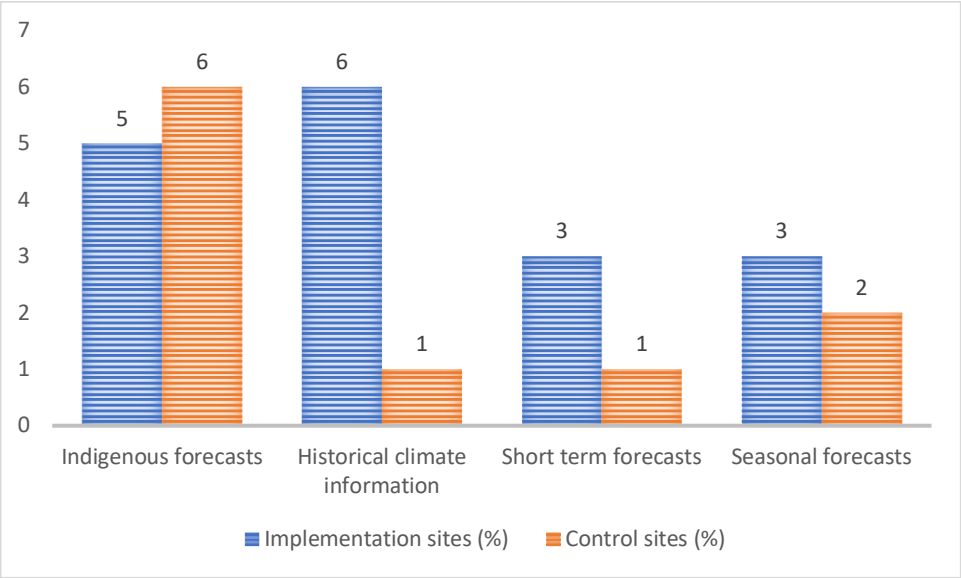

Figure 6: Percentage of interviewees who received climate information in the study sites in Guinea

As for climate information hearing, farmers receiving climate information also increase with positive DiD for all categories of climate information in Guinea.

Table 26: Difference in difference values for the percentage of interviewees who received climate information in the study sites in Guinea

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=100)	P value	Baseline (n=100)	Endline (n=100)	P value	
Awareness of climate information, content and uncertainty							
Received							
Indigenous forecasts	5%	26%	0.00	6%	6%	0.99	21%
Historical climate information	6%	26%	0.00	1%	7%	0.60	14%
Short term forecasts	3%	23%	0.00	1%	10%	0.09	11%
Seasonal forecasts	3%	26%	0.00	2%	7%	0.08	18%

Only 3% of farmers from implementation sites trusted historical climate information (Table 27). As one would have expected, that trust has increased with the project with a more positive impact in implementation sites than control sites in Guinea (Table 28).

According to farmers, the two best lead time are weeks before or months before.

Table 27: Percentage of interviewees who trust climate information in the study sites in Guinea

Climate information trust (high)	Implementation sites (%)	Control sites (%)
Indigenous forecasts	0	0
Historical climate information	3	0
Short term forecasts	0	0
Seasonal forecasts	0	0

Table 28: Difference in difference values for the percentage of interviewees who trust climate information in the study sites in Guinea

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=100)	P value	Baseline (n=100)	Endline (n=100)	P value	
Awareness of climate information, content and uncertainty							
Trust							
Indigenous forecasts	0%	13%	0.03	0%	2%	0.80	11%
Historical climate information	3%	15%	0.03	0%	6%	0.17	6%
Short term forecasts	0%	9%	0.02	0%	8%	0.22	1%
Seasonal forecasts	0%	19%	0.00	0%	8%	0.21	11%

3.2.5 Access and use of climate information

In study sites of Guinea, 49% of farmers from implementation sites and 25% from control sites had access to radio broadcast but percentage decreased in implemented and control sites by the end of the project. In this country, no farmer from implementation and control sites had never attended a training on climate information and that has improved by the end of the project with 55% from implementation sites who have attended a training on climate information (Table 29).

Table 29: Difference in difference values for the percentage of interviewees who have access to climate information in the study sites in Guinea

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=100)	P value	Baseline (n=100)	Endline (n=100)	P value	
Training on climate information							
Listening radio program	49%	45%	0.90	25%	23%	0.90	-2%
Attended to a training	0%	55%	0.00	0%	1%	0.19	54%

The yield of rice increased in implementation and control sites but the DiD value was negative for rice production. Conversely, yield increased and DiD was positive for groundnut in Guinea (Table 30).

Table 30: Difference in difference values for crop yield in the study sites in Guinea

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=100)	Baseline (n=100)	Endline (n=100)	
Yield					
Rice	446,17	819,3	252,2	754,8	-129,47
Groundnut	462,3	1221,2	727,7	822,5	664,1

3.3 Togo

3.3.1 Socio economics characteristics

Two implementation sites for CaSCIERA actions were selected in Togo: Yocotope in Maritime region, and Farende in Kara region. The control sites for no-action were respectively Mangotigome and Koukoude. In each site, it was planned to select 50 households for interviews, but during the data collection, field team interviewed 55 households in Farende, 50 in Koukoude, 52 in Mangotigome and 52 in Yocotope (Table 33). Thus, a total of 209 households were interviewed in Togo. Among the interviewees only 21% were female despite the recommendation to have 40%. The average number of households' members was 6 ranging from 5 in Koukoude to 7 in Yocotope. The average education level of household head was 4 years, the main income sources were crop farming only (12.9%) and both livestock and crop for 79.9% of the households. Majority of the household was the owner of their farm (78%) with an average size of 6 ha.

The main crops produced in Togo sites were maize, sorghum and beans. Maize was produced by 87% of household while sorghum was produced by 48% and beans by 43%. Sorghum was mainly produced in Kara region because of its adaptation to the ecological conditions of this region. Indeed 84 % of household produced sorghum in Farende and Koukoude (Table 31).

Table 31: Socio-economic characteristics of the sampled households in the sites for the baseline study in Togo

Variables	Farende (n=55)	Koukoude (n=50)	Mangotigome (n=52)	Yotocope (n=52)	All (n=209)

Household characteristics					
Age of hh* head (year)	52.6 (12.5)	51.3 (14.5)	44.4 (11.6)	47.3 (13.3)	48.9 (13.3)
Gender of respondent (% male)	75	68	98	77	79
Household size	6 (3)	5 (3)	6 (3)	7 (4)	6 (3)
Household structure					
Mb<=17 year	2 (2)	1 (2)	1 (2)	2 (2)	2 (2)
Mb>64 years	1 (1)	1 (1)	0 (1)	0 (1)	0 (1)
Education of hh head (years)	4 (4)	4 (4)	5 (4)	3 (3)	4 (4)
Income sources					
Crop farming only (%)	16.4	4.0	3.8	26.9	12.9
Livestock farming only (%)	0.0	0.0	0.0	0.0	0.0
Both livestock and crop (%)	76.4	94.0	78.8	71.2	79.9
Wage labor (%)	3.6	0.0	5.8	0.0	2.4
Trade (%)	1.8	0.0	5.8	1.9	2.4
Salaried employment/ pension (%)	0.0	0.0	3.8	0.0	1.0
Other (%)	1.8	2.0	1.9	0.0	1.4
Farm characteristics					
Own Land (%)	96	86	73	56	78
Land size (ha)	3 (2)	4 (5)	11 (22)	6 (5)	6 (13)
Mains crop					
Maize (%)	98	82	79	86	87
Sorghum (%)	84	84	6	19	48
Beans (%)	66	58	15	33	43

At end of the project, assessment was only feasible at Farende and Koukoude as Yocotope was abandoned because of local institutional issues. The average age of household head was 47 years. The household average size was 5 and the average education level of household head was 6 which was very high for rural area. The main income source was crop farming for 60% of the farmers. The main crop produced by farmers was maize produced by 92% of them.

Table 32: Socio-economic characteristics of the sampled households in the sites for the end of project study in Togo

Variables	**Farende (n=100)**	**Koukoude (n=92)**	**All (n=192)**
Household characteristics			
Age of hh* head (year)	45.6 (13.2)	49.2 (15.2)	47.4 (14.3)
Gender of respondent (% male)	84	68	76
Household size	6 (3)	5 (3)	5 (3)
Household structure			
Mb<=17 year	2 (2)	2 (2)	2 (2)
Mb>64 years	0 (1)	0 (1)	0 (1)
Education of hh head (years)	8 (4)	6 (4)	6 (4)
Income sources			
Crop farming only (%)	56.0	65.2	60.4
Livestock farming only (%)	0.0	0.0	0.0
Both livestock and crop (%)	37.0	31.5	34.4
Wage labor (%)	2.0	1.1	1.6
Trade (%)	2.0	0.0	1.0
Salaried employment/ pension (%)	3.0	0.0	1.6
Other (%)	0.0	2.2	1.0

Farm characteristics			
Own Land (%)	86	78	82
Land size (ha)	4 (3)	4 (11)	4 (8)
Mains crop			
Maize (%)	95	88	92
Sorghum (%)	51	65	58
Rice (%)	67	27	46
Beans (%)	39	42	41

3.3.2 Climate risk awareness and coping mechanism

The results were that 46% from implementation sites and 56% from control sites had not heard at all about climate change and only 16% and 2% had, respectively (Figure 7).

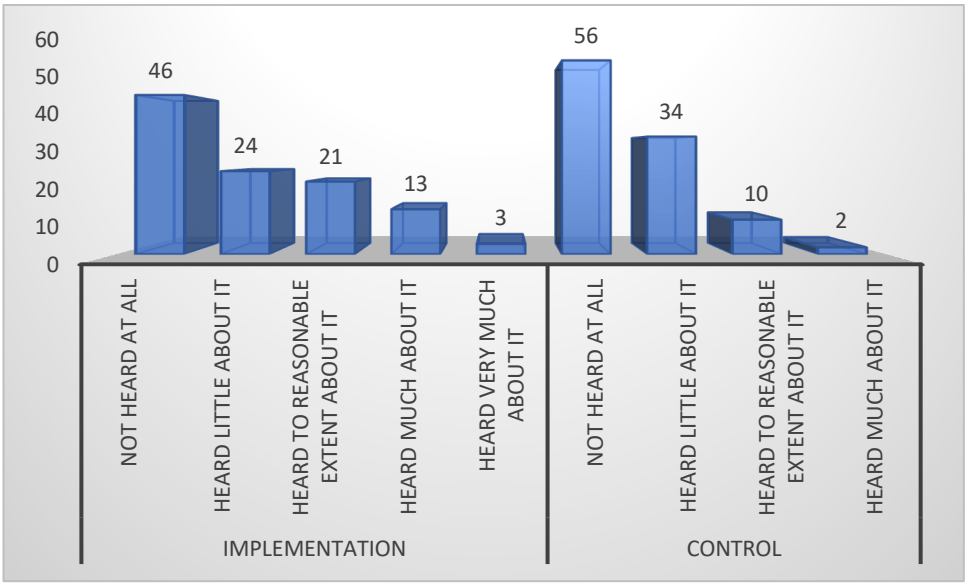

Figure 7: Awareness about climate change in study sites in Togo

From baseline to endline, the percentage of farmers who had not at all heard about climate change decreased both in implementation sites and control sites. The DiD calculated value was positive. The opposite happened for the farmers who had heard enough about climate change (Table 33).

Table 33: Difference in difference values for awareness about climate change in Togo

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=107)	Endline (n=100)	P value	Baseline (n=102)	Endline (n=92)	P value	
Climate change hearing							
Not heard at all	43%	18%	0.00	55%	46%	0.07	16%
Heard much about it	15%	16%	0.13	2%	7%	0.08	-4%

The interviewees have perceived a decrease in the number of rainfall days over the last 30 years in their areas for implementing (94%) and control (89%) sites. In turn, the number of drought spells (95% and 92%, respectively), the number of hot days (94% and 73%, respectively), the frequency (97% and 93%, respectively) and severity (97% and 95%, respectively) od drought have all increased.. The frequency of flood did not change (73% and 28%, respectively) but its severity of flood has significantly increased for 75% from implementation site and 25% from control sites.

The most important climate risks affecting farmers livelihood options during the last 5 years were found to drought (97%), erratic rainfall (59%), and floods (47%) according to farmers from implementation sites as well as in the control sites with 84% for drought, 53% for erratic rainfall and 51% for increase in temperature (Table 34).

Table 34: Climate risks affecting livelihood options (crop, livestock and others) as perceived by the farmers of the study sites in Togo during the last 5 years

Climate risks	**Implementation sites (%)**	**Control sites (%)**
Drought	97	84
Floods	47	17
Erratic rainfall	59	53
Significant increase in temperature	42	51
Significant decrease in temperature	6	0
Landslides	0	0
Windstorm	29	9
Hail (Rain with storms)	12	9
Soil erosion	4	34

The main risk was still drought in implementation sites and control sites during the endline sites. For drought, floods, significant increase in temperature and windstorm, the DiD calculated values were positive whereas those of erratic rainfall and soil erosion were negative (Table 35).

Table 35: Difference in difference for climate risks affecting livelihood options (crop, livestock and others) as perceived by the farmers of the study sites in Togo during the last 5 years

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=107)	Endline (n=100)	Baseline (n=102)	Endline (n=92)	
Climate risks					
Drought	97%	77%	84%	84%	20%
Floods	47%	46%	17%	17%	1%

Erratic rainfall	59%	39%	53%	32%	-1%
Significant increase in temperature	42%	46%	51%	58%	3%
Windstorm	29%	26%	9%	38%	32%
Soil erosion	4%	41%	34%	59%	-12%

To prevent climate risks, most of the farmers have developed no solution. Indeed, they were 81% from implementation site and 66% from control sites in that situation for drought. Values are less than 50% for the rest but still high in most cases (Table 36).

Table 36: Percentage of interviewees adopting preventive measures against climate risks affecting livelihood options (crop, livestock and others) in the study sites in Togo

Climate risks prevention	Implementation sites (%)	Control sites (%)
Drought	81	66
Floods	42	13
Erratic rainfall	49	34
Significant increase in temperature	34	37

As the absolute percentages of the number of farmers who were doing nothing to prevent climate risk decreased by the end of the project, the calculated values DiD calculated were consequently positive for all climate risks. Thus, 19% of farmers from control sites and 5% from implementation sites were planting tree to fight against drought.

Table 37: Difference in difference values for the percentage of interviewees adopting preventive measures against climate risks affecting livelihood options (crop, livestock and others) in the study sites in Togo

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=107)	Endline (n=100)	Baseline (n=102)	Endline (n=92)	
Climate risks prevention (Nothing is done)					
Drought	81%	33%	66%	46%	28%
Floods	42%	20%	13%	10%	19%
Erratic rainfall	49%	23%	34%	20%	12%
Significant increase in temperature	34%	28%	37%	38%	7%
Soil erosion		19%		20%	1%

3.3.3 Effectiveness of local leaders to assist in time of crisis

The trust is very low with values ranging from 0 to 17% (Table 38). A lot of work needs to done in this direction.

Table 38: Percentage of interviewees believing in the effectiveness of local institutions and mechanisms to provide appropriate assistance in case of crisis in the study sites in Togo

Assistance in time of crisis (Agree)	Implementation sites (%)	Control sites (%)
In times of climate hazards or in the face of climate related changes, I trust that my local government will do what is necessary to provide adaptation options/farm support to local households	11	13
These days, leaders and groups in my community are able to sort out problems in times of drought/flood	11	4
If a serious drought/flood were to take place in my local area in the future I am confident that my local government would provide me with the support I needed in good time.	10	9
These days, leaders in my community do a good job in ensuring that the basic needs of members of my community are met during times of drought/flood.	5	6
Representatives from my households are regularly invited to participate in important meetings related to the management of climate shocks in our community.	11	9
Have you ever heard of any community disaster risk prevention or community relief actions that the local community/leaders are implementing to assist the community in times of crisis?	17	4
Are you aware of any actions that the local community/leaders are undertaking to help the community better cope or adapt to climate shocks?	9	0

The absolute values have increased for all, parameters except 2, from the start up to the end of the project (Table 39). As a consequence all DiD values of la parameters (except gain the same two ones mentioned about) were positive. Better awareness will trigger actions to mitigate the effects of these risks.

Table 39: Difference in difference values for the percentage of interviewees believing in the effectiveness of local institutions and mechanisms to provide appropriate assistance in case of crisis in the study sites in Guinea

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=107)	Endline (n=100)	Baseline (n=102)	Endline (n=92)	
Assistance in time of crisis (Agree)					

Climate hazards or in the face of climate related changes, I trust local government assistance	11%	38%	13%	25%	15%
Leaders and groups in my community are able to sort out problems in times of drought/flood	11%	37%	4%	22%	8%
Serious drought/flood were to take place in my local area in the future I am confident that my local government would provide me with the support	10%	34%	9%	18%	15%
These days, leaders in my community do a good job in ensuring that the basic needs of members of my community are met during times of drought/flood	5%	31%	6%	15%	17%
Representatives from my households are regularly invited to participate in important meetings related to the management of climate shocks in our community.	11%	57%	9%	43%	12%
Ever heard of any community disaster risk prevention or community relief actions that the local community/leaders are implementing to assist the community in times of crisis	17%	1%	4%	3%	-15%
aware of any actions that the local community/leaders are undertaking to help the community better cope or adapt to climate shocks	9%	5%	0%	2%	-6%

3.3.4 Awareness of climate information, content, uncertainly

The largest awareness percentage was found the implementation site for indigenous forecast (32) and the control villages (4%). In general, values of the implementation sites are higher that the corresponding ones of the control sites (Figure 8).

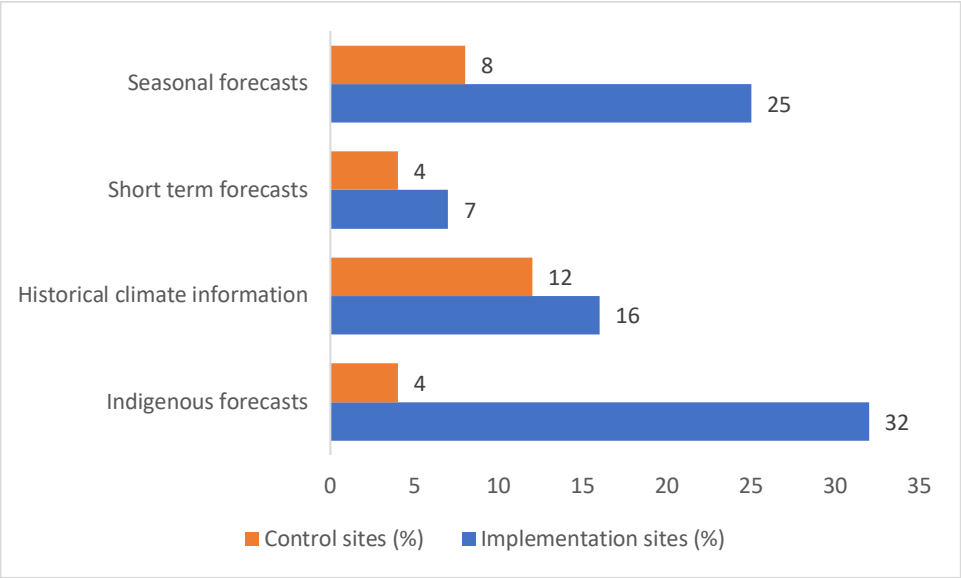

Figure 8: Percentage of interviewees aware of various types of climate information in the study sites in Togo

The percentage of farmers who had heard about climate information had increased in both implementation sites and control sites from baseline to endline. The DiD was positive for historical climate information and short-term forecast but negative for indigenous forecasts and seasonal forecast in Togo (Table 40).

Table 40: Difference in difference values for the percentage of interviewees aware if various types of climate information in the study sites in Togo

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=107)	Endline (n=100)	P value	Baseline (n=102)	Endline (n=92)	P value	
Awareness of climate information, content and uncertainty							
heard about							
Indigenous forecasts	32%	46%		4%	26%	0.00	-8%
Historical climate information	16%	36%	0.00	12%	31%	0.00	1%
Short term forecasts	7%	60%	0.00	4%	48%	0.00	9%
Seasonal forecasts	25%	38%	0.06	8%	31%	0.00	-10%

When we considered who had received climate information, the percentage became lower than who had heard. Indeed, they were 25% from implementation site and 8% from control sites who heard about seasonal forecasts, but only 12% and 7% received seasonal forecasts, respectively (Figure 9).

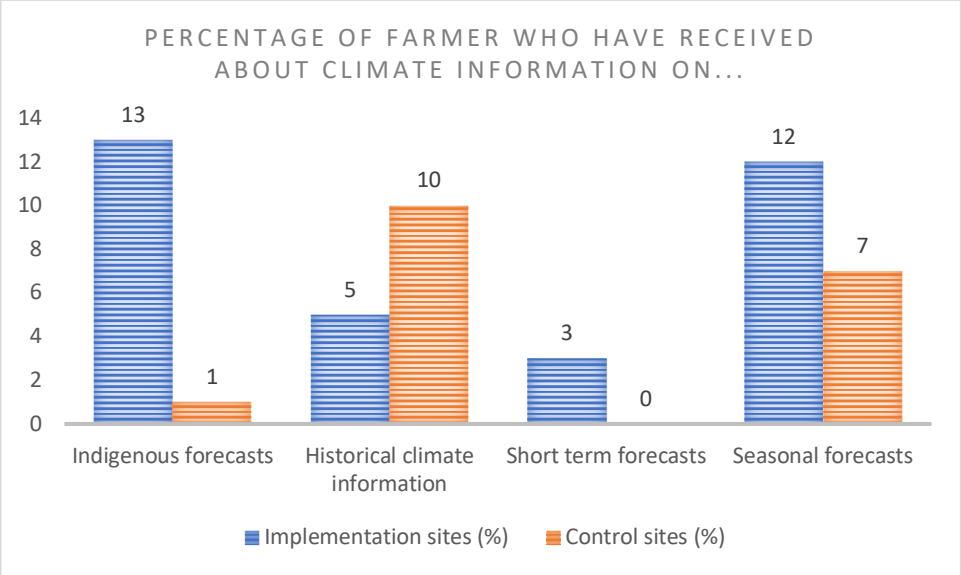

Figure 9: Percentage of interviewees who received climate information in the study sites in Togo

From baseline to endline, the percentage of farmers who received climate information was increased regardless of the parameters and types of sites. Moreover, the DiD was positive for all the four types of climate information in Togo.

Table 41: Difference in difference values for the percentage of interviewees who received climate information in the study sites in Togo

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=107)	Endline (n=100)	P value	Baseline (n=102)	Endline (n=92)	P value	
Awareness of climate information, content and uncertainty							
Received							
Indigenous forecasts	13%	36%	0.00	1%	20%	0.00	4%
Historical climate information	5%	28%	0.00	10%	18%	0.09	15%
Short term forecasts	3%	57%	0.00	0%	45%	0.00	9%

Seasonal forecasts	12%	33%	0.00	7%	22%	0.00	6%

Values obtained showed very negligible percentages (0-3%) which have slightky increased by the end of the project (6-24%) but remain very modest (Tables 42, 43). Thus DiD was positive for all the four types of climate information in Togo from baseline to endline. Again, the values remain low in the range of 0 to 10%.

Table 42: Percentage of interviewees who trust the climate information in the study sites in Togo

Climate information trust (high)	**Implementation sites (%)**	**Control sites (%)**
Indigenous forecasts	3	0
Historical climate information	3	1
Short term forecasts	1	0
Seasonal forecasts	2	0

Table 43: Difference in difference values for the percentage of interviewees who trust the climate information in the study sites in Togo

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=107)	Endline (n=100)	Baseline (n=102)	Endline (n=92)	
Awareness of climate information, content and uncertainty					
Trust					
Indigenous forecasts	3%	11%	0%	8%	0%
Historical climate information	3%	10%	1%	6%	2%
Short term forecasts	1%	24%	0%	13%	10%
Seasonal forecasts	2%	13%	0%	4%	7%

3.3.5 Access and use of climate information

In our sites of Togo, 26% of farmers from implementation sites and 32% from control sites declared they have access to information from radio broadcast. Only 6% of farmers from implementation sites had already attended a training on climate information. This situation has imnproved by the end of the project with an increase in absolute values. The number of farmers who listen radio program and those who attended a training on climate information have all

increased. As a consequence, the DiD values calculated for these two parameters were positive in Togo (Table 44).

Table 44: Difference in difference values for the percentage if interviewees who have access to climate information in the study sites in Togo

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline	Endline	P value	Baseline	Endline	P value	
Training on climate information							
Listening radio program	26%	61%	0.00	32%	35%	0.70	32%
Attended to a training	6%	22%	0.00	0%	2%	0.80	14%

For the main crops production (maize and sorghum), the yields increased from baseline to endline in Togo. The calculated DiD values were also positive.

Table 45: Difference in difference values for crop yield in the study sites in Togo

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=107)	Endline (n=100)	Baseline (n=102)	Endline (n=92)	
Yield					
Maize	711,2	1416	548,8	1179,9	73,7
Sorghum	341,4	479,3	308,8	397,7	49

3.4 Benin

3.4.1 Socio economics characteristics

Two implementation sites for CaSCIERA actions were selected in Benin: Dekpo and Zaloko in Southern of Benin. It was recommended to have a site in Northern, but this was not possible for operational reason according to local team. The control were respectively Gbelito and Holli. In each site, 50 household were randomly selected for interviews. Thus, 200 households were interviewed in Benin. Among the interviewees only 36 % were female which is the highest percentage among the four countries and very close to recommendation rate of 40% (Table 46). The average number of households' members was 8 with a minimum 6 in Zaloko and a

maximum 10 in Dekpo. The average education level of household head was 3 years. The main income sources were crop farming (49.5%) and both livestock and crop for 43.0% of the households. Majority of the households was the owner of their farm (96%) with an average size of 3 ha.

The main crops produced in Benin sites are beans, maize and cassava. Bean is produced by 56% of household while maize by 52% and cassava by 15%. Many other cereals are produced by a few numbers of households (Table 49).

Table 46: Socio-economic characteristics of the sampled households in the sites for the baseline study in Benin

Variables	Dekpo (n=50)	Gbelito (n=50)	Holli (n=50)	Zaloko (n=50)	All (n=200)
Household characteristics					
Age of hh* head (year)	43.0 (10.0)	54.9 (15.3)	43.0 (13.0)	43.2 (15.1)	46.1 (14.4)
Gender of respondent (% male)	58	44	90	74	64
Household size	10 (6)	7 (4)	8 (4)	6 (4)	8 (5)
Household structure					
Mb<=17 year	5 (3)	3 (2)	3 (3)	3 (3)	3 (3)
Mb>64 years	0 (1)	1 (1)	0 (1)	0 (0)	0 (1)
Education of hh head (years)	1 (2)	2 (4)	4 (5)	4 (5)	3 (4)
Income sources					
Crop farming only (%)	46.0	42.0	58.0	52.0	49.5
Livestock farming only (%)	0.0	0.0	2.0	0.0	0.5
Both livestock and crop (%)	44.0	48.0	38.0	42.0	43.0
Wage labor (%)	2.0	4.0	0.0	2.0	2.0
Trade (%)	4.0	6.0	0.0	4.0	3.5
Salaried employment/ pension (%)	0.0	0.0	2.0	0.0	0.5
Other (%)	4.0	0.0	0.0	0.0	1.0
Farm characteristics					
Own Land (%)	98	92	96	98	96
Land size (ha)	2 (2)	1 (2)	3(2)	4 (6)	3 (3)
Mains crop					
Beans (%)	58	84	48	34	56
Maize (%)	44	36	72	56	52
Cassava (%)	2	20	24	12	15

In Benin, a change was operated during the endline study for the site choice. Indeed, Holli was replaced by Ganhoume. Because Holli which was a control site received training from CaSCIERA implementation, what was an error for local implementation team. For endline, 43% of interviewee were female what was more than the 40% advised. The average age of household head was 41 years. The average household size was 7. The education average level was 3 years. The main income source was both livestock and crop for 69% of households. The main crop was maize produced by 70% of the farmers.

Table 47: Socio-economic characteristics of the sampled households in the sites for the end of project study in Benin

Variables	Dekpo (n=48)	Ganhoume (50)	Gbelito (n=49)	Zaloko (n=49)	All (n=196)
Household characteristics					
Age of hh* head (year)	45.3 (10.7)	37.8 (11.5)	45.6 (13.7)	36.0 (11.6)	41.2 (12.6)
Gender of respondent (% male)	67	68	39	55	57
Household size	10 (5)	6 (3)	7 (4)	6 (4)	7 (4)
Household structure					
Mb<=17 year	5 (3)	3 (2)	3 (3)	3 (3)	4 (3)
Mb>64 years	1 (3)	1 (1)	1 (2)	1 (2)	1 (2)
Education of hh head (years)	2 (3)	2 (3)	3 (5)	5 (5)	3 (4)
Income sources					
Crop farming only (%)	8.3	32.0	22.4	22.4	21.4
Livestock farming only (%)	0.0	0.0	0.0	0.0	0.0
Both livestock and crop (%)	85.4	62.0	69.4	61.2	69.4
Wage labor (%)	2.0	2.0	0.0	6.1	2.0
Trade (%)	2.1	0.0	6.1	42.0	2.6
Salaried employment/ pension (%)	0.0	0.0	0.0	6.1	2.0
Other (%)	4.2	4.0	2.0	1.0	2.6
Farm characteristics					
Own Land (%)	100	92	94	96	95
Land size (ha)	3 (4)	2 (1)	5 (11)	2 (2)	3 (6)
Mains crop					
Beans (%)	54	4	35	4	24
Maize (%)	58	76	63	82	70
Cassava (%)	10	2	14	2	7

3.4.2 Climate risk awareness and coping mechanism

The results showed that 47% from implementation sites and 54% from control sites had not heard about climate change while 17% in either type of site well aware about it (Figure 10).

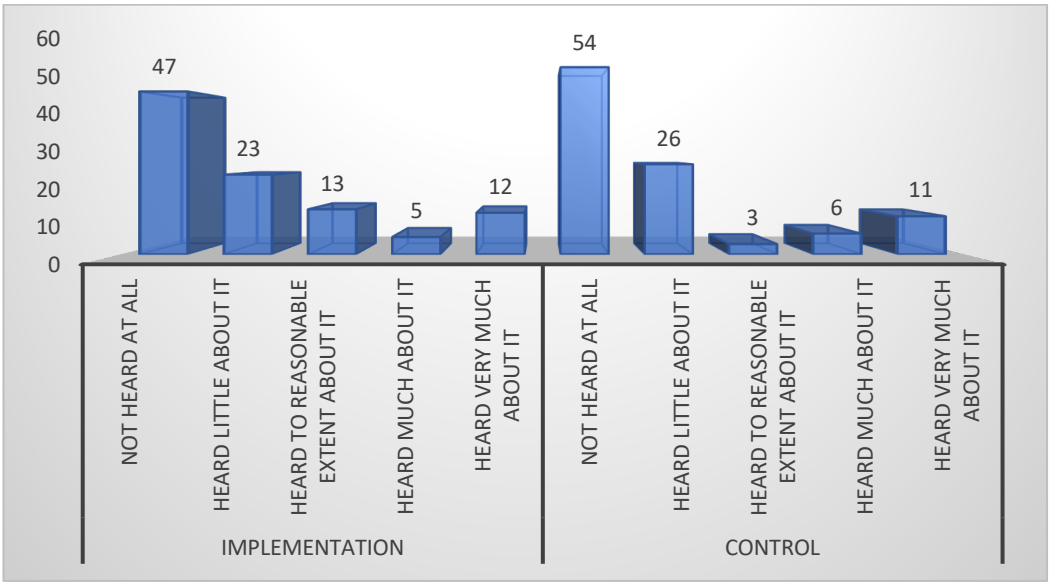

Figure 10: Awareness about climate change in study sites in Benin

At the end, the percentage of farmers had decreased in both implementation sites and control sites with positive DiD value for those who had no information. For farmers who had heard much about climate change, the percentage increased with also positive DiD.

Table 48: Difference in difference values for awareness about climate change in study sites in Benin

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=97)	P value	Baseline (n=100)	Endline (n=99)	P value	
Climate change hearing							
Not heard at all	47%	16%	0.00	54%	46%	0.80	23%
Heard much about it	17%	39%	0.00	17%	21%	0.63	18%

Large percentages of farmers believe that the number of rainy days has decreased while number of drought spells, the frequency and the severity of drought have increased. The frequency of flood did not change over the last 30 years for 63% from implementation site and 53% from control sites. However, the severity of flood has significantly increased for 68% from implementation site and 65% from control sites.

The mains climate risks that have affected livelihood sources during the last 5 years are drought (96%), floods (68%) and increase in temperature (61%) according to farmers from implementation sites and the values were 92% for drought (92%) and 56% for both erratic rainfall and increase in temperature in the control sites (Table 49).

Table 49: Climate risks affecting livelihood options (crop, livestock and others) as perceived by the farmers of the study sites in Benin during the last 5 years

Climate risks	Implementation sites (%)	Control sites (%)
Drought	96	92
Floods	68	41
Erratic rainfall	58	56
Significant increase in temperature	61	56
Significant decrease in temperature	9	5
Landslides	14	0
Windstorm	36	49

Hail (Rain with storms)	4	1
Soil erosion	45	24

In most cases, the absolute percentages of have declined at the end of the project however, there si seem to be improvement of the perception of climate risks based on positive DiD values for all parameters except two which increase in temperature and windstorm (Table 50).

Table 50: Difference in difference values for climate risks affecting livelihood options (crop, livestock and others) as perceived by the farmers of the study sites in Benin during the last 5 years

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=97)	Baseline (n=100)	Endline (n=99)	
Climate risks					
Drought	96%	88%	92%	86%	2%
Floods	68%	69%	41%	47%	5%
Erratic rainfall	58%	27%	56%	42%	17%
Significant increase in temperature	61%	20%	56%	11%	-4%
Windstorm	36%	24%	49%	17%	-20%
Soil erosion	45%	22%	24%	11%	10%

To prevent climate risks, most of the farmers have no solution. The percentages of farmers in this situation ranges from 66 to 100% meaning that at ¾ of them need help in this domain (Table 51).

Table 51: Percentage of interviwees adopting preventice measures against risks affecting livelihood options (crop, livestock and others) in the study sites in Benin

Climate risks prevention	Implementation sites (%)	Control sites (%)
Drought	67	80
Floods	66	78
Erratic rainfall	71	91
Significant increase in temperature	84	95
Soil erosion	71	100

The percentages observed at the start have all declined at the end in the implementation sites for all parameters (Table 52). The situation is less homogenous in the control sites with decrease

in the values of the percentages for 3 parameters but not in 2 remaining. Therefore, findings of the endline assessment revealed an improvement in climate risks prevention for drought and significant increase in temperature and the opposite situation for floods and erratic rainfall. There was no change for soil erosion.

Table 52: Difference in difference values for the percentage of interviwees adopting preventice measures against risks affecting livelihood options (crop, livestock and others) in the study sites in Benin

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=97)	Baseline (n=100)	Endline (n=99)	
Climate risks prevention (Nothing is done)					
Drought	67%	48%	80%	65%	4%
Floods	66%	36%	78%	39%	-9%
Erratic rainfall	71%	27%	91%	39%	-8%
Significant increase in temperature	84%	79%	95%	100%	10%
Soil erosion	71%	71%	100%	100%	0%

3.4.3 Effectiveness of local leaders to assist in time of crisis

Less than ¼ of the farmers trust the local institutions and mechanisms to support them adequately in case climatic crisis (Table 53). This can be due to a clear ignorance of what these institutions and mechanism are to, of course, a lack of real trust..

Table 53: Percentage of interviewees believing in the effectiveness of local institutions and mechanisms to provide appropriate assistance in case of crisis in the study sites in Benin

Assistance in time of crisis (Agree)	Implementation sites (%)	Control sites (%)
In times of climate hazards or in the face of climate related changes, I trust that my local government will do what is necessary to provide adaptation options/farm support to local households	16	6
These days, leaders and groups in my community are able to sort out problems in times of drought/flood	19	6
If a serious drought/flood were to take place in my local area in the future I am confident that my local government would provide me with the support I needed in good time.	20	6

These days, leaders in my community do a good job in ensuring that the basic needs of members of my community are met during times of drought/flood.	21	7
Representatives from my households are regularly invited to participate in important meetings related to the management of climate shocks in our community.	17	10
Have you ever heard of any community disaster risk prevention or community relief actions that the local community/leaders are implementing to assist the community in times of crisis?	1	0
Are you aware of any actions that the local community/leaders are undertaking to help the community better cope or adapt to climate shocks?	0	0

The trust for assistance in time of crisis has changed in two ways. We have a positive change for the last 3 parameters of table 54 and negative for the first 4 parameters of the same table. All these changes remain marginal with 2-13% for the positive DiD values and -11 to -7% for the negative ones.

Table 54: Difference in difference values for the percentage of interviewees believing in the effectiveness of local institutions and mechanisms to provide appropriate assistance in case of crisis in the study sites in Benin

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=97)	Baseline (n=100)	Endline (n=99)	
Assistance in time of crisis (Agree)					
climate hazards or in the face of climate related changes, I trust local government assistance	16%	7%	6%	8%	-11%
leaders and groups in my community are able to sort out problems in times of drought/flood	19%	11%	6%	6%	-8%
serious drought/flood were to take place in my local area in the future I am confident that my local government would provide me with the support	20%	11%	6%	7%	-10%
These days, leaders in my community do a good job in ensuring that the basic needs of members of my community are met during times of drought/flood	21%	14%	7%	7%	-7%
Representatives from my households are regularly invited to participate in important meetings related to the management of climate shocks in our community.	17%	28%	10%	8%	13%

ever heard of any community disaster risk prevention or community relief actions that the local community/leaders are implementing to assist the community in times of crisis	1%	5%	0%	2%	2%
aware of any actions that the local community/leaders are undertaking to help the community better cope or adapt to climate shocks	0%	6%	0%	2%	4%

3.4.4 Awareness of climate information, content, uncertainly

The highest value was observed for the indigenous forecast (38%) and the lowest for the historical information (22%) in the implementation sites (Figure 11). The is no clear trends across the parameters when comparing the implementation sites and the controls.

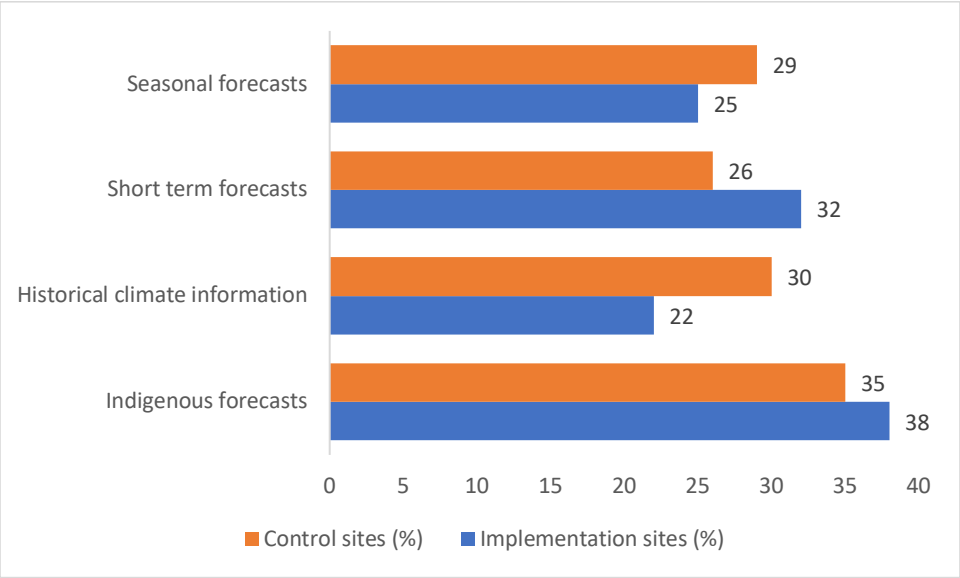

Figure 11: Percentage of interviewees aware of various types of climate information in the study sites in Benin

For the awareness of climate information, we had a positive change for all climate information in Benin for famers who had heard about climate information. This is an indication of positive effect of the project on people about various sources of climate information in Benin (Table 55).

Table 55: Percentage of interviewees aware if various types of climate information in the study sites in Benin

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=97)	P value	Baseline (n=100)	Endline (n=99)	P value	
Awareness of climate information, content and uncertainty							
heard about							
Indigenous forecasts	38%	62%	0.00	35%	43%	0.15	16%
Historical climate information	22%	41%	0.00	30%	5%	0.00	44%
Short term forecasts	32%	40%	0.17	26%	10%	0.00	24%
Seasonal forecasts	25%	41%	0.00	29%	35%	0.06	10%

When we considered who had received climate information, the percentage became lower than who had heard. Indeed, they were 25% from implementation site and 29% from control sites who heard about seasonal forecasts, but only 10% and 12% have received it, respectively (Figure 12).

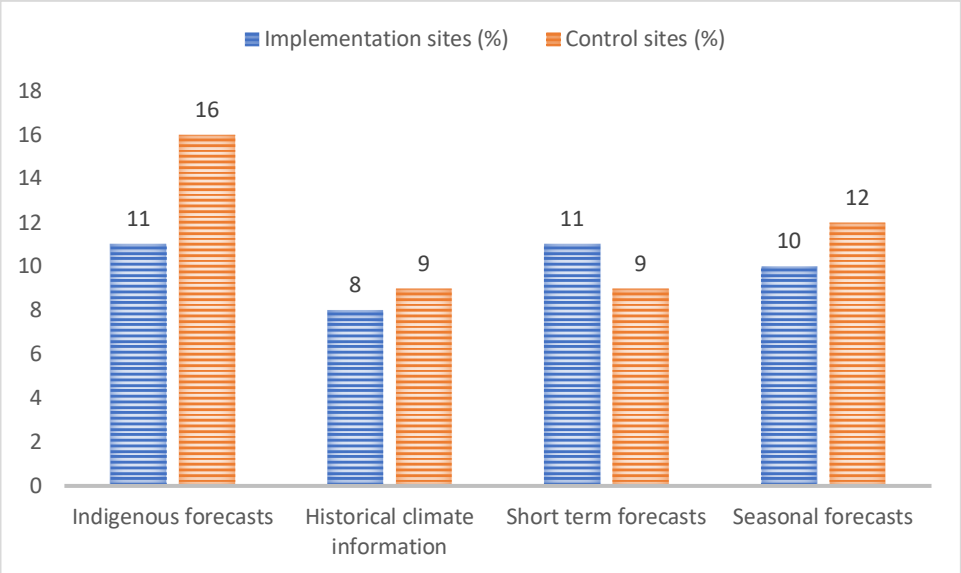

Figure 12: Percentage of interviewees who received climate information in the study sites in Benin

For the farmers who had received climate information, the impact in Benin was also positive for all climate information as shown in the table 56. However, this effect is marginal ranging from 5 to 13% and not significant statistically.

Table 56: Difference in difference values for the percentage of interviewees who received climate information in the study sites in Benin

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=97)	P value	Baseline (n=100)	Endline (n=99)	P value	
Awareness of climate information, content and uncertainty							
Received							
Indigenous forecasts	11%	26%	0.00	16%	19%	0.77	12%
Historical climate information	8%	7%	0.70	9%	3%	0.17	5%
Short term forecasts	11%	17%	0.18	9%	6%	0.22	9%
Seasonal forecasts	10%	20%	0.08	12%	9%	0.80	13%

There no trust in climate information (0-2%) as shown in table 57 and one wonders if this is not due the ignorance of the existence of that climate information, for what it can be useful and how to use/apply it in decision making for improved livelihoods.

Table 57: Percentage of interviewees who trust climate information in the study sites in Benin

Climate information trust (high)	Implementation sites (%)	Control sites (%)
Indigenous forecasts	1	2
Historical climate information	0	1
Short term forecasts	2	1
Seasonal forecasts	0	0

Improvement in the trust in climate information has been positive at the end of the project but remains limited with 6 to 14% for DiD values in Benin (Table 58).

Table 58: Difference in difference values for the percentage of interviewees who trust climate information in the study sites in Benin

	Implementation		Control		Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=97)	Baseline (n=100)	Endline (n=99)	
Awareness of climate information, content and uncertainty					
Trust					
Indigenous forecasts	1%	19%	2%	14%	6%
Historical climate information	0%	7%	1%	1%	7%

Short term forecasts	2%	13%	1%	1%	11%
Seasonal forecasts	0%	20%	0%	6%	14%

3.4.5 Access and use of climate information

At the start of the project, 44% of farmers from implementation sites and 40% from control had access to information from radio broadcast and only 4% attended a training on climate information in both types of sites. At the end, data analysis showed a positive impact of the project both for listening radio program and attendance to training on climate information. Indeed, we had a positive DiD for these two parameters with a very significant effect for attendance to a training in the selected sites of in Benin.

Table 59: Difference in difference values for the percentage of interviewees who have access to climate information in the study sites in Benin

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=97)	P value	Baseline (n=100)	Endline (n=99)	P value	
Training on climate information							
Listening radio program	44%	27%		40%	13%		10%
Attended to a training	4%	91%	0.00	4%	2%		89%

The analysis of project impact in crop yield in Benin showed a positive impact based our DiD values espite a decrease in the absolute values (Table 60). Stabilizing the yield in poor rainy season of also one of the goals which the short duration of the project did not help us to capture.

Table 60: Difference in difference values for crop yield in the study sites in Benin

	Implementation			Control			Difference in difference estimate)
Parameters	Baseline (n=100)	Endline (n=97)	P value	Baseline (n=100)	Endline (n=99)	P value	
Yield							
Maize	951,7	873,4		981	882,3		20,4
Cowpea	443,9	439,1		522,1	485,9		31,4

4. Conclusion

CaSCIERA-TA aims the capacitating of stakeholders in using climate information for enhanced resilience in the agricultural sector in West Africa. The baseline study intended to establish a reference situation of the access and uses of climate information by farmers in the implementation and control sites in Niger, Guinea, Togo and Benin. Against that baselining, progress was assessed by an end of project evaluation. The findings revealed that project implementation has allowed farmers to have access to climate information, to understand what mean each information and how to use it for mitigating climate risks for more resilient livelihoods. There is globally a change on the perception of climate information. The project was implemented only for two years. We think that the project will have more impact if more time was given for its implementation.