# Solidaridad



# Bringing agriculture capacity, carbon and knowledge to REDD+

# Final Report over 2013-2016



Foto 1: Productora Rosa Santeliz Galvez en su vivero de plantas.

Foto 2: Productor Bernabé Ruiz Gallegos en su parcela modelo implementada por el programa.

Foto 3: Productor Federico Nájera, secando su café en la secadora solar implementada por el programa

Photographer: Rodolfo García Rodríguez

Report on **Bringing agriculture capacity, carbon, and knowledge to REDD+** (BACK to REDD+) implemented by **Solidaridad** under the Climate and Forest Initiative funding scheme for civil society

*The deadline for delivering the report is 1 May, unless your contract says otherwise, electronically to* *postmottak@norad.no.*

## 1. General Project Information:

1.1    Name of recipient organisation: **Solidaridad**

1.2    Reporting year: **April 2013 – June 2016**

1.3    Agreement Number: **QZA-13/0081**

**1.4**    Name of project: **Bringing agriculture capacity, carbon, and knowledge to REDD+ (BACK to REDD+)**

1.5    Country and/ or region: **Colombia, Mexico and Peru**

**1.6**    Financial support to the project from Norad for last calendar year 2016: **0 NOK**

1.7    Thematic area: **Sustainable Landscapes**

## 2. Describe the project's progress for previous calendar year:

*Result chain:*

| What resources are used? | What is done? | What is produced or delivered? | What do you wish to achieve? | What long-term change are you aiming for? |
|---|---|---|---|---|
| **Inputs** | **Activities** | **Outputs** | **Outcomes** | **Impact** |

*With reference to the Result Chain as illustrated above, Norad requires feedback mainly on products/ services (outputs) and end effect on target groups (outcomes) in the progress report.*

2.1 *Give a short description of the **project's target group(s)** and what the baseline for the target group was at the start of the project (from the approved project document).*

For the overall project the targets groups are: coffee smallholders, technical assistance providers, market players buying sustainable products, relevant governmental institutions and policy influencing organizations

**Colombia – target group**

| Municipality | Farmers |
|---|---|
| Apía | 410 |
| Balboa | 246 |
| Belen de Umbria | 574 |
| Guática | 328 |
| La Celia | 656 |
| Marsella | 410 |
| Mistrató | 246 |
| Pereira | 410 |
| Santuario | 984 |
| Total | 4264 farmers |

The following chart shows the average area for coffee by the producers on the pilot farms. As can be seen, the vast majority are farmers with less than 3 ha.

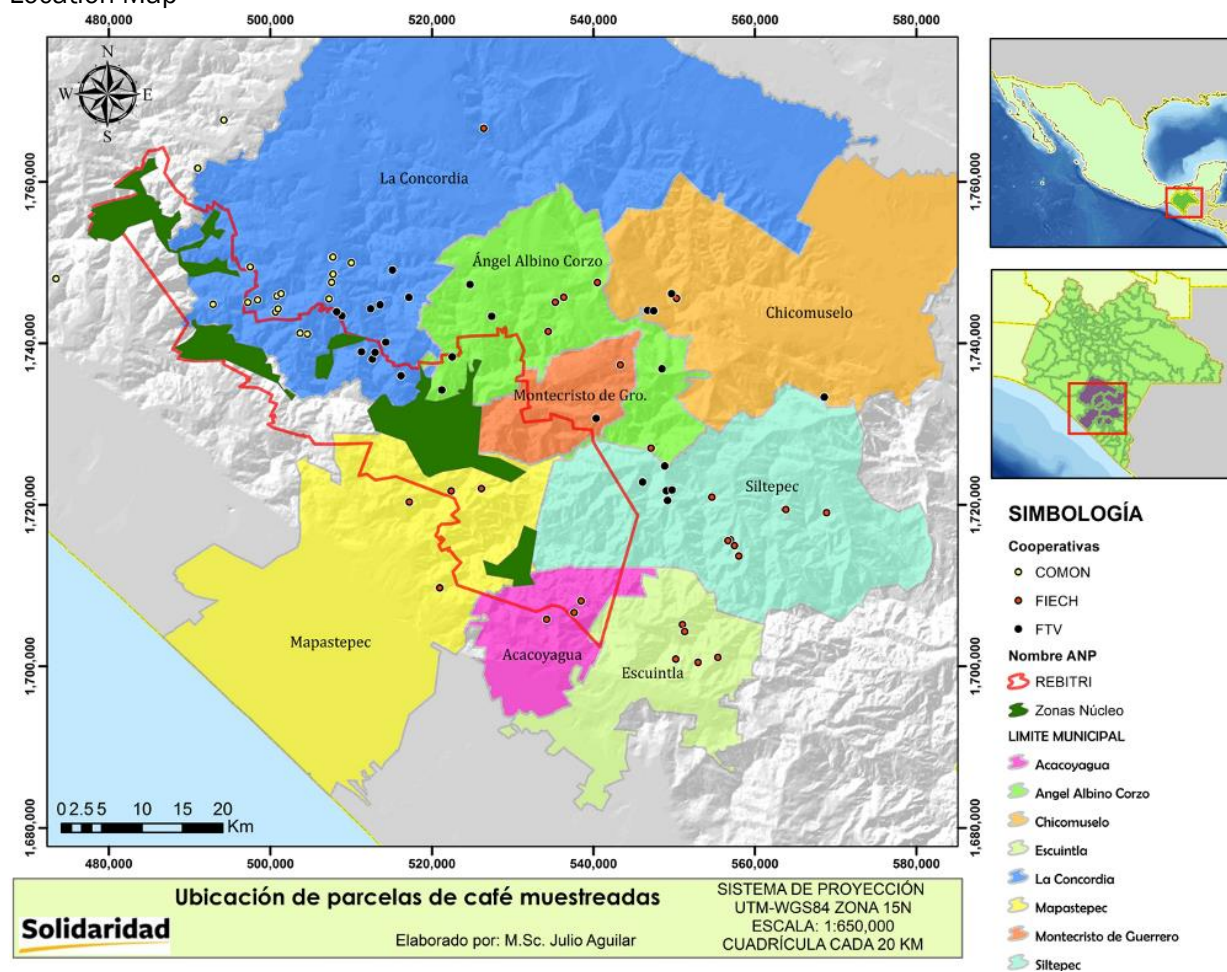| Area of coffee - pilot farms in Colombia | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MUNICIPALITY | LESS THAN 3,0 has. | | 3,0 - 5,0 has. | | 5,0 - 10,0 has. | | MORE THAN 10,0 has. | | TOTAL ÁREA CAFÉ | TOTAL No. CAFICULTORES |
| | Área Café | No. Cafic. | Área Café | No. Cafic. | Área Café | No. Cafic. | Área Café | No. Cafic. | | |
| APIA | 78,15 | 62 | 30,56 | 8 | 102,30 | 14 | 118,85 | 5 | 329,86 | 89 |
| BALBOA | 62,89 | 38 | 49,17 | 13 | 10,76 | 2 | | | 122,82 | 53 |
| BELEN DE UMBRIA | 162,44 | 134 | 70,86 | 19 | 36,42 | 6 | 63,81 | 4 | 333,53 | 163 |
| GUÁTICA | 67,81 | 66 | 12,77 | 3 | 12,42 | 2 | | | 93,00 | 71 |
| LA CELIA | 147,12 | 102 | 101,78 | 26 | 127,87 | 20 | 28,94 | 2 | 405,71 | 150 |
| MARSELLA | 89,99 | 69 | 38,07 | 9 | 55,11 | 9 | 62,57 | 2 | 245,74 | 89 |
| MISTRATO | 54,43 | 47 | 21,85 | 6 | | | | | 76,28 | 53 |
| PEREIRA | 75,23 | 62 | 43,93 | 12 | 65,27 | 10 | 77,81 | 5 | 262,24 | 89 |
| SANTUARIO | 174,13 | 121 | 141,67 | 38 | 295,59 | 44 | 132,14 | 10 | 743,53 | 213 |
| TOTAL | 912,19 | 701 | 510,66 | 134 | 705,74 | 107 | 484,12 | 28 | 2.612,71 | 970 |

## MEXICO – target group

In Mexico the project is focused around the *Reserva de la Biosfera el Triunfo (REBITRI)*. The project is developed with 3 producer cooperatives, combining producers located in 6 coffee producing municipalities which adjoin with the REBITRI. The 3 coops represent 5,384 hectares.

So far 850 producers have been trained and 27 demonstration farms have been established by the lead farmers.

| Group | Priority activities |
|---|---|
| Comon Yaj Nop Tic SSS | |
| Triunfo Verde SSS | ☐Renovation and management of older coffee plantations<br>☐Waste management (water and pulp)<br>☐Improvement of shade management |
| FIECH | ☐Soil conservation and soil improvement |

Location Map



Ubicación de parcelas de café muestreadas

**Solidaridad**

Elaborado por: M.Sc. Julio Aguilar

SISTEMA DE PROYECCIÓN
UTM-WGS84 ZONA 15N
ESCALA: 1:650,000
CUADRÍCULA CADA 20 KM

## PERU – target group

The Back to REDD + Peru project is developed it the north-eastern of the country, in San Martin, a rich region in natural resources and in biology with high rate of endemism, as well as a hide cultural, environmental, landscape, and climatic diversity. It has a multiethnic and multicultural population, being the majority of it migrant from the Andes who maintain traditional practices related to the agricultural and livestock sector; mostly weather dependent activities. These practices are vulnerable to climate change risk and therefore, uncertainty increases about productivity.

San Martin has a territory of 51,253 km2 and represents 6.5% of the total Peruvian Amazon, inlcuding 4 national protected areas and other conservation areas which represent 3.2% of the total area of the region. The rate of deforestation is one of the highest in the country 135,000 Hectares/ year. The economy is based mainly on agriculture (coffee, cocoa, rice) and livestock (cattle).

Coffee growing started in San Martin since the 60s. The coffee growing area and production has  has expanded strongly over the past 2 decades. Today San Martin is the second highest coffee production region in Peru with an approximate of 94 thousand hectares (22% of total national coffee area) and with a concentration of producers of 41,000, with an average of 2.3 hectares of coffee per family.

The priority area for the development of the project was identified in six basins basically in five provinces, San Martin, Rioja, Moyobamba, Saposoa and San Jose de Sisa, in the region of San Martin, Peru. Inside of this territory there are different groups of coffee producers organized by different types of associations, associations of small producers, cooperatives, committees and business smallholder producer groups, Some of these organized groups participating in the project are located in the buffer zones of national and private areas of conservation. However, for the selection of the groups, the following criteria were established:

a) The selected groups must be outside of any area of protection (established minimally in the buffer zone).
b) Reliable groups by reference from buyers and history.
c) That the groups maintain a sustainable type of certification, fair trade or organic.
d) Groups interested and willing to support the project development.

Solidaridad worked with several of these cooperatives in previous programs, so they are known and have progressed in applying Good Agricultural Practices, handling various certifications, production of high quality coffee cup for special markets or certificates. Note that with the groups that have previous work, new partners were selected who have not being benefited previously by another project and are in an improve process with the current proposal.

In 2016 the project continued to work with the same organizations, although they are still weak in their management due to the yellow rust that persisted and which causes more weakness in social sector as a whole.

The work was continued with 15 organizations and 1202 beneficiaries' producers.

| WATERSHED | ORGANIZATION | Type of Organization | # Members |
|---|---|---|---|
| YURACYACU | CAPEMA | Cooperative of coffee producers | 152 |
| | PRODELSUR | Company | 18 |
| | Unorganised farmers | | 30 |
| INDOCHE TONCHIMA | CAFÉ DONCEL | Cooperative of coffee producers | 44 |
| | CAFÉ NOR ( ANTES CEDROS CAFÉ) | Association of small coffee producers | 20 |
| | ASOC. VALLE GRANDE | Association of small coffee producers | 9 |
| | ASOC. VILLA HERMOSA (antes Café Doncel) | Association of small coffee producers | 24 |
| | Unorganised farmers | | 104 |
| GERA | APROECO | Cooperative of coffee producers | 78 |
| | COPAGROIN | Association of small coffee producers | 21 |
| | FRUTOS DE SELVA | Cooperative of coffee producers | 49 |
| | Unorganised farmers | | 52 |
| YANAYACU | APROECO | Cooperative of coffee producers | 9 |
| | EX CAPOMIR (Unorganised farmers) | | 23 |
| | CORDILLERA ANDINA | Committee of producers | 23 |
| | FRUTOS DE SELVA | Cooperative of coffee producers | 94 |
| | Unorganised farmers | | 52 |
| SISA | AFRUSEL | Association of small coffee producers | 34 |
| | APAEZASS | Association of small coffee producers | 46 |
| | CAS  EL DORADO | Association of small coffee producers | 44 |
| | Unorganised farmers | | 76 |
| SAUCE – PACHIZA | CUENCAS DEL HUALLAGA | Association of small coffee producers | 200 |
| | | | 1203 |

| | |
|---|---|
| # of organized producers | 888 |
| # of unorganized producers | 315 |
| TOTAL   de beneficiarios CCC | 1202 |

2.2    *Please repeat the project's **desired impact** (from the approved project document).*

Overall the project demonstrates how farming can shift from being part of the problem to part of the solution to deforestation and climate change.

- Increased revenue streams to finance transition from business-as-usual to climate-smart agriculture (CSA)
- Increased climate smart agriculture (CSA) technical assistance
- Increased uptake of climate smart agriculture leading to:
  - Reduced GHG emissions in coffee farms and supply chains, the reduced expansion of these agricultural systems into forests
  - Improved productivity of coffee smallholder systems, resulting in higher incomes, reduced poverty and increased food security.
  - Increased resilience of farming systems to climate change, resulting in adaptation.

The adoption of CSA will make farming systems more productive and resilient thereby guaranteeing supply of commodities for future generations to come. Forest conversion will not be necessary to meet future demand for coffee. Farmers' livelihoods are improved, food security is enhanced and poverty is reduced.

Whilst the costs of transitioning to CSA is initially financed by grants, new revenue streams are developed to share the costs along the value chain (as additional premium payment or a carbon credits sales), and potentially outside the value chain in the carbon marketer payments for adaptation.

2.3    *Is the project still relevant for the desired impact? (Yes/No) If No, please give a short explanation.*

Yes, the project is still relevant especially given the 2015 COP 21, or Paris Climate Conference, which brought international attention and urgency to implementation of adaptation and mitigation methods. The coffee industry is also still struggling with a slow recovery from the coffee leaf rust epidemic, and changing climate patterns. During the ICO forum on September, 21st, a study was presented in which experts warn that coffee farmers face dangerously low profits. The urgency to invest in the coffee sector was clearly announced, see also: https://icocoffeeorg.tumblr.com/post/150775120970/coffee-farmers-face-dangerously-low-profits

**COLOMBIA - relevance**

If one takes into account that some of the municipalities of influence in the project are located in areas that, because of climate change, will be seriously affected in terms of water balance, incorporating shade trees in the cultivation management scheme is an important strategy for adaptation.

The region where the project is being implemented in Colombia is located in the Cauca River's largest basin, between 4 and 6 degrees N latitude, with an average temperature of 21° C and maximum 27° C at 1400 meters above sea level (m.a.s.l.). This implies that resilience to climate change, sustainability, and conditions for high productivity are necessarily linked to reducing the temperature of the coffee trees' canopy by 1 to 1.5° C on farms located at less than 1400 m.a.s.l. This drop in temperature in the coffee plantation microclimate can be achieved through coffee agroforestry systems that regulate shade cover (contributing on the order of 30% shade between trees and natural shade). To the contrary of fears that planting trees other than coffee will reduce the plantation's productivity, shade will rather improve productivity and make the farm more sustainable and resilent.

Additionally, the Project Zone is influenced by the weather phenomena "el niño" and "la niña." Last year and the period to date, "el niño" was quite strong. This phenomenon is characterized by lack of rain and has dramatic effects on coffee production. Filling the cherry is under threat and in the worse cases doesn't happen at all. The farms, that have established agroforest systems and utilize smart agricultural practices that give benefits as they are more resilient to the "el niño" phenomenon and to climate change.

In the annex Nr. 2 you can see a business case with some evaluations about the impact of having agroforestry systems in the coffee farms. The data obtained allows concluding that the losses caused by "El Niño" phenomenon can be reduced by interspersing shade trees in coffee fields, bearing in mind the characteristics of successful crops evaluated. However, not just any type of shade is beneficial. It should be stressed that in order to achieve positive results, the first step should be the selection of the adequate shade and then the shading method should be properly managed, in terms of density and exposure, among other factors, so as to avoid competition with the crop. The highest sales revenues are registered in coffee fields with Guamo trees planted in adequate densities ($2'522,588 Colombian pesos per hectare). Subtracting the variable value of the grain harvest, we also find that this production system is the only one that produces enough revenues to cover other production costs.

## MEXICO - relevance

Yes, the project is still relevant for the desired impact, and the production model developed and implemented. The model responds to 3 basic necessities:

a. The coffee production system design was improved due to the increased density of plants per hectare from 1800 plants at project start to a density of 5,000 plants / ha at project end. Due to this increase in coffee plants per hectare, the expectation is that production volume will increase 300%.. In addition, an improved drying system has increased grain quality (less defects) by 30%. These two improvements will increase farmer income.
b. The GHG emmission reduction model (at a few demonstration farms) has mitigated up to 70% of emissions under an installed system of biodigesters and bio-filters that reduce the organic load of wastewater , thus the balance of emissions vs capture has allowed us to improve $CO_2$ capture by 59%. This intervention was part of the project's adaptation strategies related to climate change and food security,
c. Also as part of adaptation strategies for climate change and food security, the improve coffee production systems design included a spatial arrangement that allowed inclusion of crops that diversify producer income, and food and nutritional consumption. The incorporation of rust resistant coffee varieties will improve production yield while safeguarding quality in the specialty coffee market into which the cooperatives sell their green coffee.

The project has validated a technological and production model that increases productivity, food security, resilience to climate change, while simultaneously reducing emissions and deforestation. Intensification expected to increase yields 300% is leading some farmers to reduce the total area under production and focus on plots that are more suited to coffee growing, and also more accessible. There is evidence this may lead to natural regeneration of prior production areas, either through abandonment or intentional reforestation activities. Together all these practices contribute to mitigation of climate change. The project has generated significant interest in local NGOs, neighbouring cooperatives, and buyers such as Starbucks and Louis Dreyfus, as well as national level organizations such as the Secretary for Agriculture and Livestock (SAGARPA) and Conservation Biology Institute (CONABIO) as a model for replication not only in Chiapas but in all coffee producing states in Mexico.

## PERU - relevance

Yes, the group of producers are using unsuitable production systems, they need to learn how to properly manage their natural resources to achieve sustainability of its coffee agroforestry systems on their farms (more resilient), managed them in a comprehensive way for higher incomes and with little or no environmental impact and showing their experiences to other producers of the region or other ones.

2.4    *Please repeat the project's outcome(s) (effect on project´s target group(s), counterpart(s), beneficiary (-ies)) (from the approved project document).*

Building carbon stocks
- 85 101  tons of CO2 avoided emissions
- 135 356  tons of CO2 sequestered
- 180 hectares of avoided deforestation

Building capacity
- 7 800 smallholders adopt climate smart agricultural practices
- 180 technical assistance providers receive training on climate smart agriculture.

Building knowledge
- Feed results to inform the development of CSA tools, carbon credit standards (VCS, Gold Standard, CCBA) and agricultural certification schemes (Fairtrade, UTZ Certified, Rainforest Alliance and Organic) and national REDD+ and development strategies with a view to bring CSA practices to scale.


2.5    *Are there any internal and/ or external factors that have affected the project in any significant way?*
   a) *Specify deviations from plans.*
   b) *Give a short risk assessment*

a) Deviations from plans
Due to worsen of the exchange rate between NOK and EUR, we have experienced a budget cut over 3 year of 495 350 Euro. This has partly been compensated for by agreements with partner organizations that co-finance activities and furthermore, activities have been sized down to fit actual budget.
In 2015 and 2016, the project in Colombia had a very positive dynamic, which allowed it to be current with all planned activities. With the projections and the commitment of allies and producers, all established commitments and executions will be met.

b) Short risk assessment
It is expected that less farmers and less outcomes will be reached then initial planned.


## PERU – risk assessment

In 2015 coffee leave rust continued and the Agricultural Ministry started a programme to control leave rust. Through this governmental programme the majority of the qualified agronomists were contracted, leaving most of the cooperatives and companies in the area without qualified staff. This created a competition that could not be met due to the high remuneration of the ministry.

There is a risk that the fragile cooperatives in San Martin will break down due to inadequate administrative management. The cooperatives are fragile at organizational level because they are very young organizations and not yet well consolidated.

In recent years, weather conditions have caused problems such us; rains out of their traditional time-slots, higher temperatures than normal, among other changes that have been reflected as losses to the coffee families of the San Martin region and other regions of Peru, some effects were demonstrated in diseases such as Yellow rust, falling blooms, reduced fruit set of coffee, aborted fruits, among others. These problems have caused significant economic losses in the last four years (from 2012 to 2015). The impact of the producers' economy has been reflected in deforestation of their own land to ensure food.

## USA – risk assessment

The internal factor that affected the project was the resignation of the director of economic development from Solidaridad North America in spring 2015. This director also served as the international coordinator for sustainable landscapes, as well as the project manager for Back to REDD activities in USA. Her resignation resulted in a significant loss in institutional knowledge.

## MEXICO – risk assessment

Beginning in 2011-2012, the increased presence of rust in the area caused an alarming decrease of production of coffee. This decrease continued to worsen during the 2015-2016 harvest. The phenomenon was similar in other coffee growing areas of the country, and has subsequently forced the country to become a net importer of coffee instead of net exporter (import 3 million tons compared to 2.5 million tons produced in the last harvest, ANACAFE data). According to SENASICA report, weather conditions (high temperature) presented favourable conditions for reinfection of young coffee plant leaves in the new production cycle. This reinfection rate highlights the importance of a comprehensive approach that includes management of pruning and shade, fertilization, weed control and renewal of plantations.

The historical lack of technical assistance and knowledge transfer in crop management; as well as the resistance to the adoption of improved production techniques and leaf rust resistant varieties have resulted in exhausted and old production systems that are extremely vulnerable to climate change. The process of empowerment and implantation of Climate Smart Agriculture practices first had to be introduced as pilots. Now that the techniques have been validated, and there are robust plantations with new rust resistant varieties entering into production, the production model is ready to be scaled up.

✓ In the 2015-2106 coffee harvest, according to a UNPC, only 50% of the estimated average yield was harvested.
✓ According to the Drought Monitor of Mexico (report of July 31, 2016), the area where the Biosphere Reserve El Triunfo is located had abnormally dry conditions. This is partly due to the effect of El Niño, a phenomenon whose intensity and frequency has increased in a climate change context.
✓ The current devaluation of the Mexican currency has helped in the short term via improvement in grain prices, however, the problem remains that producers are getting smaller volumes of coffee due to problems with rust (El Financiero Newspaper).
✓ The impacts of the project is at risk of not scaling or even losing results achieved to date due to the lack of funding to continue with reinforcement of capacities, monitoring, investment in plantation renovation and rehabilitation, and replication of technical package developed. A second phase is not only desirable, but absolutely necessary for the sustainability of this intervention.

**Results:**

*Reporting of results must at least be at the output level (above the activity level). In addition, outcome must be stated where possible (see result chain above). Where it is too early to document outcome, please explain why.*

2.6    *Main outputs and outcome(s).*
   a) *Report on the main products/services (outputs) the project has delivered to achieve the planned outcomes.*
   b) *Report on all outcomes from the project document where possible:*
      1. *What changes have been achieved with reference to the baseline?*
      2. *Report on the key indicators used to document that the desired change has occurred. Are the outcomes expected to be sustainable?*
   c) *Are the outcomes expected to be sustainable?*

| DEMO | COL | PER | MEX | TOTAL |
|---|---|---|---|---|
| # farmers | 900 | 60 | 27 | 987 |
| HA | 2,424 | 155 | 70 | 2,649 |
| HA/FARM | 2.7 | 2.6 | 2.6 | 2.7 |
| Volume of CSA coffee in kg parchment | 3,436,875 | 156,556 | 80,213 | 3,673,644 |
| Yield in kg/ha/yr | 1,418 | 1,007 | 1,140 | 1,188.43 |
| Yield improvement | 9% | 98% | 214% | 65% |
| | | | | |
| PARTICIPATING FARMS | COL | PER | MEX | TOTAL |
| # farmers | 4,382 | 1,142 | 850 | 6,374 |
| HA | 7,721 | 2,958 | 2,850 | 13,529 |
| HA/FARM | 1.8 | 2.6 | 3.4 | 2.1 |
| Volume of coffee | 10,397,405 | 2,088,666 | 1,311,000 | 13,797,071 |
| Yield in kg/ha/yr | 1,347 | 706 | 460 | 1,020 |
| Yield improvement | 4% | 70% | 27% | 21% |
| TOTAL | COL | PER | MEX | TOTAL |
| # farms | 5,282 | 1,202 | 877 | 7,361 |
| HA | 10,145 | 3,113 | 2,920 | 16,178 |
| HA/FARM | 1.9 | 2.6 | 3.3 | 2.2 |
| volume of CSA coffee | 13,834,280 | 2,245,222 | 1,391,213 | 17,470,714 |
| Yield/ha | 1,364 | 721 | 476 | 1,080 |

We have trained 7 361 farmers in 3 years in 3 countries. We came close to the goal of 7800 farmers but we have met serious budget and time constrains. The 7 361 farmers have a coffee production area of over 16 000 hectares and produced in the last harvest 2015/2016 almost 17 500 ton of coffee. This means that the cost per kilo of coffee over the last year was 7 euro cent. This is in range with premiums paid for certified coffee.

| Farmers applying 2 or more CSA practices | COL | PER | MEX | TOTAL |
|---|---|---|---|---|
| total farmers trained (demonstration and normal farmers) | 5282 | 1,202 | 877 | 7,361 |
| females | 1104 | 112 | 65 | 1281 |
| female percentage | 21% | 9% | 7% | 17% |
| farmers applying 2 or more CSA practices | 3,091 | 1,308 | 717 | 5,146 |
| percentage farmers applying / farmers trained | 59% | 109% | 82% | 70% |
| female | 664 | 130 | 34 | 828 |
| female percentage | 21% | 10% | 5% | 16% |

**Of the 7 361 farmers trained 5 146 farmers apply 2 or more of the practices taught, this is 70% and significate a nice uptake of the trainings. 16% of these farmers are females.**

| Agronomist trained | COL | PER | MEX | Total | % |
|---|---|---|---|---|---|
| # TA trained in CSA (part of project) (total) | 120 | 101 | 53 | 274 | |
| # female TA trained | 45 | 23 | 19 | 87 | 32% |
| # other TA trained (not part of projects) (total) | 72 | 98 | 15 | 185 | 40% |
| # female other TA trained and providing training to other farmers (not part of projects) | 27 | 22 | 2 | 51 | 28% |
| TOTAL TA TRAINED | 192 | 199 | 68 | 459 | |
| TOTAL FEMALE TA TRAINED | 72 | 45 | 21 | 138 | 30% |
| | 38% | 23% | 31% | | |

The goal was to train 180 agronomists and we reached a lot more, this was possible through FNC in Colombia and the virtual courses given in Peru as well as more agronomists have shown up in trainings then initially expected. Good to note that women participation was 30%, which is almost double compared to women farmers participating.

| Carbon Performance | Colombia | | | Peru | | | Mexico | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2013 | 2016 | % improved | 2013 | 2016 | % improved | 2013 | 2016 | % improved | 2013-2016 improvement |
| carbon emissions reduction on DEMO coffee farms TON CO2 eq. / HA | 6.4 | 6.2 | 4.1% | 7.3 | 1.5 | 79.3% | 6.2 | 1.6 | 74% | 10,6 ton CO2/ ha |
| carbon emissions reduction on PARTICIPATING coffee farms TON CO2 eq./ HA | 6.4 | 6.2 | 3.1% | 7.3 | | | 6.2 | 3.6 | 42% | |
| TOTAL CO2 eq. TONS reduced emissions | 2 204 | | | 18,050 | | | 7,615 | | | 27,869 TON |
| carbon emissions reduction on DEMO coffee farms KILO / KILO COFFEE (PARCHMENT) | 5.5 | 4.4 | 20.0% | 6.1 | 2.2 | 63.9% | 16.9 | 9.3 | 45% | |
| | | | | | | | | | | |
| carbon sequestration on DEMO coffee farms TON CO2 eq./ HA | -13.8 | -17.5 | -26.5% | 1.2 | -0.7 | 39.5% | -7.2 | -13.2 | 84.1% | 9.2 ton CO2/ha |
| carbon sequestration on PARTICIPATING coffee farms TON CO2 eq./ HA | -54.7 | -65.6 | -20.0% | 1.2 | | | -7.2 | -9.1 | 27.0% | |
| TOTAL CO2 eq. TONS sequestred | -93 336 | | | 1 468 | | | -5 950 | | | -97 818 TON |

Using the Cool Farm Tool we have been able to assess the carbon reductions and sequestration. Total reduction in 2016 compared to 2013 is 27 869 ton of CO2 eq. and sequestration of 97 818 ton of CO2 eq. These results are not up to what we initially expected; this is mainly due to the coffee rust. In Mexico we found that 75% of all coffee trees in the project area were infected, which was higher than expected, the same pattern was found in Peru. We needed to adjust the top 5 CSA practices and include replacement of infected coffee trees with resilient varieties. Those new trees are not yet fully productive and meant a significant change in carbon performance.

## COLOMBIA – main outcomes

During the project, 1544 hectares were improved. These coffee plantages had already shade trees and the shade management has been improved. Having shade trees in coffee plantations allows coffee growers to exercise control over their water economy, which mitigates the effects that periods of water deficit impose on production; furthermore, shade trees help maintain soil fertility, contribute to reducing erosion, recycle nutrients, provide large quantities of organic matter, and make the farms more resilient to climate change.
During the project, 720 ha were transformed from non-shade systems to agroforestry system.



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Additionally, 9,471 forest species trees were delivered. With project resources young entrepreneurs are being supported in having forest nurseries. These nurseries guarantee that in the future forest material will continue to be supplied and be a source of income for the youth.

The table below provides detailed information on the farms participating in the project.

**Hectares under shade trees**

| MUNICIPALITY | Implemented (Improved and new agroforestry systems) 2014-2015-2016 | Unshaded monocultures that change to agroforestry systems |
|---|---|---|
| APIA | 228,49 | 57,59 |
| BALBOA | 86,34 | 64,12 |
| BELEN DE UMBRIA | 322,12 | 145,12 |
| GUATICA | 23,06 | 0,51 |
| LA CELIA | 146,35 | 60,63 |
| MARSELLA | 160,27 | 89,3 |
| MISTRATO | 104,86 | 0,4 |
| PEREIRA | 141,64 | 92,35 |
| SANTUARIO | 331,1 | 210 |
| TOTAL | 1.544,23 ha | 720,02 ha |

Agreements have been made with farmers who have nurseries of native species to supply the project farms with native trees.

In addition, 376.29 hectares of conservation corridors have been planted. Local rural extension teams were consulted and came to the agreement to promote four (4) species for coffee agroforestry systems. Other species to be planted were chosen by the coffee grower, and this decision was respected and appreciated.

The following table lists the areas benefitting from the project.

Hectares of biological connectors in the La Esmeralda watershed in Santuario. REPORT: December 31, 2015.

| Herramientas | Comprometida | Sembrada | Total general |
|---|---|---|---|
| Cerca Viva | 0,25 | 6,69 | 6,93 |
| Conservación de Bosque C/C | | 4,60 | 4,60 |
| Conservación de Bosque S/C | 1,47 | 195,42 | 196,89 |
| Minicorredor | 0,00 | 1,41 | 1,41 |
| Plantación Forestal | 1,07 | 2,61 | 3,67 |
| Sistema Agroforestal | 22,44 | 165,58 | 188,01 |
| Total general hectares | 25,22 | 376,29 | 401,51 |

Taking into account that fertilization is the practice that generates the most emissions within the carbon footprint in Colombia coffee production systems, soil analysis was promoted as a tool for appropriate fertilization. In 2015, 469 soil analyses were supported for farms of the project participants,

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From April 2015, field activities were initiated from the agreement that has the following objectives: i) Evaluate the effects of a balanced fertilization program, compared to traditional fertilization, on coffee production; ii) Determine the environmental impact of the fertilization program by measuring the carbon footprint; and iii) Calculate the cost/benefit relationship of the study programs.

In association with the Norwegian company: Yara, 10 sample parcels were established with fertilizer that has a reduced carbon footprint in its production process. Also, fertilizing plans adjusting to the necessities of the crops were validated.

The following table shows the differences obtained in demonstration parcels with Yara. It compares a traditional fertilization plan with a suggested technical plan using reduced footprint products. Emissions indicators for nitrogen fertilizer application in the field, calculated for each locality.

| Localidad | Indicador de reducción de emisiones Kg $CO_2$/KgN Aplicado | | Diferencia % |
|---|---|---|---|
| | **Plan Yara** | **Plan Caficultor** | |
| La Moravia-Mistrató | 5,55 | 9,54 | 41,8% |
| El Porvenir-Guatica | 5,53 | 9,70 | 42,9% |
| La Libertad-Apia | 5,55 | 5,61 | 1,1% |
| El Paraiso-Marsella | 5,53 | 9,58 | 42,2% |
| Moravia-Pereira | 5,54 | 9,67 | 42,7% |
| El Tejar-Santuario | 5,53 | 9,53 | 41,9% |
| La Esmeralda-La Celia | 5,53 | 9,35 | 40,8% |
| La Italia-Balboa | 3,80 | 9,47 | 59,9% |

Another key practice to reduce soil erosion and with the end of reducing emissions is the integrated management of weeds. In 2015, 834 select weed equipment, a tool for promoting good management, were delivered to demonstration farmers (+ $30) during field visits. With this tool the producers could implement noble coverings for their crops and diminish erosion, see annex Nr. 3 for more information on this weed control equipment, 'Selector')

It is necessary to generate knowledge along with the practice of CSA coffee production. For this reason an agreement is in place with the National Center of Coffee Investigation (CENICAFE) to research subjects that are relevant to the region. Currently four subjects are being researched:

- Evaluation of the risk of soil erosion in the Colombian Coffee Zone
- Spatial variety of organic matter in soil
- Availability of cations in solution in soil and their relationship to soil properties
- Coffee's response in the nursery stage to changes in the relationship of calcium and magnesium generated by use of lime.

Meetings have been held with Expocafe to explore the possibility of working with a roaster interested in the subject of carbon in coffee.

In Colombia, Solidaridad is working with the BANCO2 strategy. BanCO2 is a payment system for eco-systems that promotes strategic conservation of the ecosystem and improvements in the quality of life for the region inhabitants. The members of BANCO2 are farmers who have in their properties natural forest for conservation and make their living from small-scale agricultural and livestock activities. Those that enter into the BANCO2 community are individuals companies and institutions that adjust their carbon footprint to social, environmental and business responsibility, and conduct transactions directly with the Bank and the farmer-owners of the carbon reserves. Compensation for $CO_2$ emissions is based on voluntary delivery of an economic quantity of money proportional to the tons of $CO_2$ emitted, and additionally on the implementation of a possible emission management and reduction program. Currently the project is working toward the participating families becoming members of the initiative. http://banco2.com/v2/

### Policy influencing

Taking into account that 2015 was an election year for mayors and governors, discussions were held with the political groups from the department of Risaralda to position and highlight the role and importance of the climate change mitigation mechanism called REDD+. To this end material describing the related content of the REDD+ mechanism and the benefits and opportunities represented by its implementation in the departmental and national territory was prepared for the decision makers.

The political lobby is concentrated in the departmental electoral campaigns of Risaralda, the Departmental Assembly, and the Mayoral race of Pereira; however there were approaches made to the campaigns for mayor in Dosquebradas, Santa Rosa de Cabal and Marsella. These approaches were initially made to personnel from the campaigns' work teams, later meetings were held directly with the

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candidates. This allowed technical influence on the proposals formulated by the work teams on their "Governmental Plan and Management" proposal, with the intention that the subject of climate change and especially the REDD+ mechanism be covered in the public management proposals.

After the approach to the electoral campaign work teams, direct meetings with the gubernatorial and mayoral candidates were scheduled and held with the end of socializing the previous work and obtaining political commitment to advance the REDD+ mechanism's implementation in the departments. In these meetings material was shared that established and described the principal advantages, benefits and opportunities offered by the REDD+ mechanism. In this sense it was well-received and there was feedback from the candidates who showed interest in working and bringing about the management necessary to advance the REDD+ mechanism implementation in the department of Risaralda.

Currently, in accord with the received commitments, arrangements to advance meetings with the governor of Risaralda and the mayor of Pereira and their work teams to formulate the Departmental and Municipal Development Plan are moving forward, incorporating objectives and related goals with climate change and especially the REDD+ mechanism.

## MEXICO - main outcomes

The baseline survey to determine carbon footprint by using the Cool Farm Tool, showed us very relevant data: about 80% of GHG emissions generated during the production of coffee in 81 sample plots originate in wastewater produced during the wet processing of coffee. Therefore, work on this activity is essential to reduce emissions. However, the situation faced by coffee producers, because the old plantations, low productivity affected by rust (Hemileia vastatrix) in the last three years, the lack of training of producers to meet this problem and lack of technical assistance have caused producers have focused on the activities of improving productivity as priority activities in order to improve their income under the production system CSA helps prevent the spread of the areas to natural areas (deforestation). It is noteworthy that the coffee is a perennial crop and requires management practices and crop improvement based on plant phenology, therefore the training topics to develop must correspond to the phenological stage of the coffee plantation. Also, one of the strategies used to adapt the cultivation of coffee to climate change is the introduction of resistant varieties. This strategy will promote crop resilience of changes in temperature and precipitation. But unawareness of the producers on the benefits of these varieties makes the process of adoption is slow.



*Low productive coffee farm in Mexico*          *New well established coffee farm in Mexico*

The greatest satisfaction so far is to know that the expected level of production is at least 20 quintals per hectare. Producers who have more than 2 or 5 plots would focus only on the most suitable for coffee production and other areas could stay for restoration or possibly avoid expanding into natural areas. The results will be evidenced through the model plots established with rust resistant varieties and based on CSA management practices.

The application of CSA practices in coffee production can reduce GHG emissions and increase carbon stocks captured.

The transition to the practices of the CSA in the coffee cultivation requires consideration (in time and resources) of  caused by factors such as severe infestation of rust, the existence of very old plantations that are susceptible to diseases and pests, low production of coffee, and the historical lack of technical assistance and training (Mexico).

Coffee price fluctuations, as well as the price of agricultural inputs required in its production system, often push producers to prioritize certain activities over another in order to improve their incomes. Therefore it is necessary to work towards a diversification of production as an alternative to reduce vulnerability to economic factors such as market.

It is necessary to promote the recovery of crops through the introduction of new coffee varieties that cope with rising temperatures and reduced rainfall, which are better adapted to the new behaviour of these agro-climatic variables, and to acknowledge that the renovation of coffee plantations is a slow process among producers.  Any renovation project should have a five year horizon to move from plantation establishing through harvest and a complete production cycle .

During the measurement of GHG emissions generated during the production process of coffee, it was estimated that the total emissions, 80% are generated by wastewater due to the amount of COD (chemical oxygen demand) containing. In response, as a mitigation plan, a system of wastewater treatment was installed using a digester and a system of Bio-filters in order to address two key issues: (1) Reducing emissions from wastewater: the bio-digester has reduced 92% of the COD of wastewater. (2) Capturing the methane gas generated by the wastewater to generate bio-gas which can be used in cooking the producer.

Quantified GHG emissions within CSA pilot projects aligned with carbon monitoring tools within scientific community and mutual acceptance of methodologies and tools.

There is currently a collaboration with The Nature Conservancy (TNC) and Rain Forest Alliance participating in the community learning of REDD + in Chiapas, Mexico.
Field visits have been made with the staff of TNC and Solidaridad.

See this for several testimonials from Mexico: https://www.youtube.com/watch?v=q8JWbcoF6LE (in Spanish)

The final presentation with the end results of Mexico are attached as annex Nr. 4

## PERU – main outcomes

Because of the scarcity of qualified agronomists and resources to hire staff by cooperatives, the project has adjusted the strategy. A programme called facilitators was started. Sons and daughters of coffee producers with capabilities and willingness to assist producers with good production practices were selected. They receive additional training and will be able to continue supporting and demonstrating CSA practices after the end of the project and without assistance of an agronomist at cooperative level. The facilitators will not be paid; their advantage is the additional training they receive.

Complementary to the 4 online CSA modules materials for agronomists, facilitators and producers have been elaborated and used. Developed are:
- 23 short descriptions of the most important CSA practices
- 10 radio messages
- 1 field book for farmers to monitor their progress on CSA practices and general coffee production management
- For agronomists a guide on Climate-Smart Coffee production has been started to develop to support the online courses as a reference document (will be available in 2016).

These materials support the trainings.

All participating producers have been visited by an agronomist (between 3 and 4 visits per year) and received personalised advice to improve their farm management and implement CSA practices. Their progress is closely monitored. From a first evaluation we have to following results:
- 81% of the producers have indicated quantitative and qualitative improvements in their coffee farms since they joined the programme.
- 62% of the producers indicated that applying CSA practices improved their productivity and therefore do not expand their coffee farm and some intent even to reduce in the coming years.



The agroforestry system of coffee cultivation should be managed under a multi-layer model in order to improve the GHG balance. The multi-layer system has 3 layers: the lower one is coffee, the second layer consists of shade trees of Inga and the highest layer is made by high shade trees and good wood trees. The implementation of CSA can reduce considerably the GHG emissions while incrementing carbon stocks in agroforestry systems in Peru and especially a multi-layer agroforestry.

The model of coffee agroforestry is constantly investigated for further fine tuning. Through a partnership with the university in Moyobamba 10 studies have already be concluded on impact monitoring, emission reductions and carbon sequestration.



From the carbon performance measurement it is clear that most emissions come from $N_2O$ production due to fertilizer use in the field, followed by emission during fertilizer production and on the third place are the emissions from waste water. Nevertheless these emission the storage of carbon in the agroforestry system is higher and the total agroforestry coffee production is a net capture system of carbon. In annex 5, an example of carbon performance of a demonstration farmer in Peru.

Through meetings we have be sharing our learning and searching for strategic partnerships in San Martin with SCAN PERU National Platform (SCAN PERU), Conservation International, ICRAF, Soluciones Prácticas, ministry of agriculture (MINAGRI), regional government of San Martin, Institute of research in the Peruvian Amazon (IIAP), Rainforest Alliance, National Coffee board (JNC), regional environmental authority (ARA), San Martin REDD, National REDD, and the Environmental Regional Commision of San Martin (CAR SM). With all these efforts Solidaridad has been able to put CSA on the agenda of the entire coffee sector in Peru.

It is important to mention the work of Solidaridad team in support the reactivation of the Technical Coffee Platform in the Region of San Martin. At this platform the different actors of the sector interact in favour of common interests and to improve the coffee sector. The regional government has now taken over the Climate Smart Coffee production approach of Solidaridad for the San Martin region.

The strategic partnership between the Coffee and Cocoa Peruvian Committee (CPCC), SCAN PERU Sustainable platform and Solidaridad created the project "Coffee and Climate", co-financing by the cooperation of Switzerland (SECO). The strategic partnership will roll out the work done by Back to REDD to other regions of Peru. And will seek to influence in public policies to focus coffee research on CSA and global warming in the Peruvian coffee sector.

## USA – main outcomes

Solidaridad North America developed a list of potential private sector partners and worked to build relationships with key decision makers from each organization. Every time Solidaridad North America spoke with a company anywhere, coffee was discussed as a possible area of collaboration. Solidaridad North America made a concerted effort to inform market players of this project and its desired impact. A few companies of interest in 2015 included PepsiCo, Coca-Cola, Ben & Jerry's, Starbucks, Pete's Coffee & Tea, Philz Coffee, Blue Bottle, La Colombe and Tim Horton's. Solidaridad North America also researched and evaluated buyers and roasters like Equal Exchange, Cooperative Coffees, Shelbourne Falls Coffee Roasters, and Yellow Seed. We found promising overlaps in key sourcing cooperatives for each roaster and project participants. In all of the above engagements we are seeking interest to buy the project coffee with carbon credits or with knowledge of the carbon performance of the coffee without official carbon credits, or to co-invest in the project, and communicate and learn together through the project.

Solidaridad North America continued to maintain relationships with partners. In particular, Solidaridad North America participated in Tropical Forest Alliance 2020, as a means to identify businesses committing to zero-deforestation, as well as advance the development of national efforts through participation in calls and other communication.

Solidaridad North America also managed the relationship with partner VCS in planning for phase two, and developing a methodology beyond farm level. Solidaridad North America participated in key discussions on landscape sustainable production standard to create a common understanding internally, analyse options, consider terms of engagement and develop a definition of a sustainable landscape. Despite the initial interest, no concrete cooperation has been established so far.

## EUROPE – main outcomes

In Europe partnerships were maintained with Cool Farm Alliance and Gold Standard. By supporting the development of the agricultural methodology for generating carbon credits we have accelerate it's development. By linking Cool Farm Alliance and Gold Standard they have set up a direct partnership. Gold Standard has accepted the Cool Farm Tool as a trustworthy tool for measuring carbon performance. Some adjustments needed to be made which have been followed up by Cool Farm Alliance. In 2016, some points of the Cool Farm Tool were not accepted and projects now need to do a separate calculation on these points if relevant to their project. This is a set-back. The access to carbon credits, the complexity and costs can significant be reduced if the Cool Farm Tool is fully accepted by carbon credits standards. Now that the CFT is not fully accepted this goal has not (yet) been met. We also reached out to carbon credit traders like Climate Neutral Group. The kind of credits this project could generate have a clear added value but no concrete buyers have been identified so far.

To engage private sector partners a list of potential companies was developed and follow-up as well as building the business case, both in arguments and numbers, which is attached as powerpoint presentation (annex Nr. 6). Potential interested parties are Superunie, a Dutch retailer, Hesselink, the most sustainable roaster in the Netherlands (Rank a Brand), Beyers a Dutch trader and This side up a small direct trader.

*Cross cutting concerns.* *Report on whether the project has contributed to*

a) *Reduced corruption*

All activities arising from the implementation of the project have been made based on a series of procedures that can be observed and evaluated. This is part of a strategy to avoid any possible act of corruption in the course of project execution. Throughout the implementation process of the project we have stressed awareness of the importance of proper implementation, documentation and reporting, and sought the presentation of an implementation model that was not part of a system of corruption.

The alliances that are being established are with organizations that have a good reputation in resource management. Contracts are being drawn up that clearly establish the commitments of the parties involved. Compliance policies are also established in some cases. In Colombia, contracts and expenditures are audited by third-party companies.

b) *Gender equality*

Gender Policy is a crosscutting theme in all programs carried out by Solidaridad in its programs. The inclusion of women in training activities and within the pilot farms to be established is being promoted.

| GENDER BALANCE | Colombia Achieved 2016 | Peru Achieved 2016 | Mexico Achieved 2016 | TOTAL Achieved 2016 |
|---|---|---|---|---|
| Total farmers trained (demonstration and participating farmers) | 5,282 | 1,202 | 877 | 7,361 |
| Females farmers | 1,104 | 112 | 65 | 1,281 |
| Female percentage | 21% | 9% | 7% | 17% |
| | | | | |
| Farmers applying 2 or more CSA practices | 3,091 | 1,308 | 717 | 5,146 |
| Percentage farmers applying / farmers trained | 59% | 109% | 82% | 70% |
| Female farmers | 664 | 130 | 34 | 828 |
| Female percentage | 21% | 10% | 5% | 16% |
| | | | | |
| Total agronomists trained | 192 | 199 | 68 | 459 |
| Total female agronomists trained | 72 | 45 | 21 | 138 |
| Female percentage | 38% | 23% | 31% | 30% |

c) *Respect for human rights*

Our projects are set up in such a way, that farmers, whether men or women, can participate.

Principles of non-discrimination of all forms are taken into account in all project activities, and participatory and inclusive processes are encouraged that dignify the participating coffee growers

Project Cooperatives and producers maintain organic certification and Fairtrade certifications which both take in count respect for human rights and requires monitoring of actions taken in the field and in the communities, where the members of cooperatives are live.

*2.8* **Lessons learned**. *Give a short description of lessons learned during the year in question.  For final report, please summarize lessons learned for the whole agreement period.*

- A better management of the agroforestry coffee production system offers a partial solution, since on average 35% of their land is used for coffee production of small holders in San Martin. At income level the coffee provides around 50% of the annual income (between 40% and 60%). A more integrated approach is required to further improve their livelihoods, which include other production systems (Peru).

- The adoption of climate smart coffee cultivation practices by coffee producers will accelerate in terms of in addition to environmental benefits, they will perceive economic benefits. The coffee producers adopting management practices will reduce the carbon footprint, if that implies not sacrificing coffee production. With labor such as the technical management of shade, planting a greater amount of coffee trees per area, and efficient fertilization, a lowering of the carbon footprint will be achieved and an increase in the productivity of the production system.

- In terms of carbon management, the farms can initiate pilots planting trees in the renovated plots. In this manner they can start to evaluate the benefits and limitations of incorporating trees into the production of coffee in the field. Projects that incorporate trees are long-term (more than 15 years) and the results many times are not visible in the first years of implementation.

- Capturing carbon in coffee and associated production systems is new, not very intensively studied and with few projects implemented in the field of Colombian coffee production. For this reason it is necessary to undertake more studies related to measuring methodologies, the impact of different systems on the carbon footprint, practices that allow for the shrinking of the carbon footprint, economic evaluation of the possible measures to be implemented. In this way greater knowledge can be generated and improved levels of climate smart practices can be adopted.

- The methodology for calculating carbon footprint serves to determine the GEI emissions, but this proves useful only if there is a parameter for comparison, that is, the production system or farm must analyse the calculations in a way that can compare the emissions from distinct years and observe if there have been reductions or increases in GEI attributable to the implemented practices. In this way it is recognized that emissions that can be reduced or compensated for depend on what the farm decides on as a strategy for environmental sustainability. During the first years of the project, improvements in the footprint are few. Only after five years are substantial improvements made and significant amounts captured.
- It is recommended that time tracking be implemented on parcels with coffee-and-tree agroforest systems in the different regions to more profoundly document the effect management has on tree growth.

- It is recommended to evaluate new fertilizers that have a low carbon footprint (like those from Yara) with dosages of lower quantities of nitrogen. To define the fertilizer plan, it is useful to take into account the soil analysis. These analyses should be accompanied by an economic an economic analysis that justifies changes and doesn't affect the financial development of the farm.

- A lesson was learned on the importance of building institutional knowledge to facilitate a smooth transition between staff and project managers. In 2015, Solidaridad implemented Salesforce as a cloud-based database to better manage accounts, projects and share information (USA).

| 3 | Case/success story |
|---|---|

3.1 *Please give a short description of a positive result (at any level of the results chain) which the project has achieved the last year. The case should include a short description of the activity, a description of what was achieved and how this relates to the planned outcomes. The case may be shown on norad.no or other public Norwegian website.*

See annex 2 for the success story from Colombia

Photos on front page taken by Rodolfo Garcia, Solidaridad

| 4 | Project's accounts for last year: |
|---|---|

*4.1 The accounts must relate to the approved budget for the year in question. All deviations (positive and/ or negative) must be clearly shown and explained.*

*Attachment: Audited accounts and completed form from the accountant for last year's accounts.*
*Only after a contract expires should unspent funds be returned to Norad.*

See annex 1 for the audited financial report on the period January 2015 till June 2016

Date: 14 of October 2016

Signature

Attachments:
1. Audited financial report 2015-2016
2. Planting shade trees as a strategy to mitigate the impact of "El Niño" phenomenon on coffee farms in Colombia
3. Poster on selector, weed equipment promoted in Colombia
4. Result presentation of BACK to REDD project in Mexico.
5. Example of Walter Gutierrez, demonstration farmer in Peru
6. Business case developed for roasters