



Project Completion

PILOT PROGRAM FOR CLIMATE RESILIENCE (PPCR)

DYNAMIC AGRO-FORESTRY REPLANTING

August, 2020



Demonstration Plot; Ministry of Agriculture compound – Nu'u

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1. PROJECT DETAILS:

Project Name	Pilot Program for Climate Resilience (PPCR) DYNAMIC AGROFORESTRY REPLANTING
Location	Upolu & Savai'i
Reporting Period	August, 2020
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The proposed project aimed to demonstrate and exemplify measures that will increase the climate resilience of agricultural communities across Samoa – and other Pacific island nations. Expected key impacts are as follows:

- Replanting of degraded coconut land with mixed agroforestry will increase soil coverage, soil carbon content and moisture retention, and thus reduce soil erosion.
- Replacement of senile, tall, single coconut palms with mixed strata forests reduces the damage of catastrophic climate events to the existent tree stock. This reduces the risk of damage caused by toppled trees to people, livestock and buildings.
- Multi-strata agroforestry involves both market and subsistence crops. Notably, the replacement of older stand-alone coconut trees with younger trees significantly reduces the risk of a total loss of food supplies and farm income, as is likely to occur with coconut monocrops or unprotected field crops during a major catastrophic event, such as a cyclone. This increases food security and community resilience.
- The projected significant increase in agricultural productivity per ha of land planted under mixed agroforestry increases the economic resilience of smallholder farmers even in the absence of catastrophic climate events.

2. DYNAMIC AGRO-FORESTRY REPLANTING PROGRAM

According to the target to achieve within the framework of the PPCR project through our partnership with Ministry of Agriculture and Fisheries (MAF), 300 ha of coconut, cocoa trees and fruit trees have to be planted until end of 2019. Currently about 800 acres with coconut, cocoa and fruit trees have already been established. The project is designated only for the islands of Upolu and Savai'i and all efforts are spending in fulfilling the task in planting.

This project has taken into account a number of threats threatening Samoa's resilience of ecosystem:

- Habitat loss, degradation and fragmentation
- Invasive species
- Unsustainable use and management of natural resources
- Poorly planned development activities
- Climate change and climate variability

The DAF team was extended by 4 persons and now consists of a total number of 8 DAF field officers. The team is in charge of guiding the establishment of the DAF plots, starting mainly with planting of cocoa and coconut. Timber and fruit tree planting have still to be completed in most of the fields.

Even though the team accompanies the farmers during the first steps of planting, important details of planting techniques like biomass accumulation around the planted trees are not always realized by the farmers later on.

The strong collaboration between Serendi and the Farmers is vital to ensure replanting program succeeds for the generation to come.

Selection Criteria was drafted for SCS to guide the replanting process to ensure the effectiveness and the efficiency of the project.

Farm Leader Selection Criteria

- Committed farmer
- Accessible farm
- Farmer willing to host trainings 4-6 times per year
- Farmer has ability to document; basic literacy
- Farm/farmer represents a cross-section of farmers in the region in terms of farm size, age of coconut trees, etc.

Demo Farm Goals

- Facilitate and encourage farmer-to-farmer exchange
- Provide tangible technical support to farmers
- Identify and address priority issues for SCS farmers
- Open up a space for Serendi Coco staff to further interact with Serendi Coco member farmer

Programing Steps

- Assess and engage committed farmers
- Plan and support cultural techniques to be demonstrated *with* participating farmers
- Schedule field visits
- Promote field visits to surrounding community
- ICS staff to facilitate field visit
- Evaluate program for farmer attendance and adoption of practices

Things to remember in demonstration farms and trials

- Keep it simple
- Build upon what farmers are already doing - ensure demonstrations/trials are within the farmers' capabilities
- Keep demos simple - two to four new practices- one of which must be what the farmers are currently doing.
- Characterize the farming/cropping system and ensure that any demos are based on what the farmers do on each soil type
- An ideal size of demo must allow farmers to assess the labour requirements of new technologies/interventions being demonstrated

3. REPLANTING PROCESS:

(i) LAND DIAGNOSTIC (ii) TRAINING (iii) ESTABLISHMENT OF PLOT

Replanting team attend to the land where assessment is crucial to ensure we discourage deforestation when planning to replant. Thus, include identifying whether the existence plantation have pest diseases particularly the rhinos beatles and/or anything that may seem suspicious to hinder the replanting.

The field was a former pasture land with old coconut and some old seconodaray trees species like Erythrina, Nonu and other local species. Some of the trees have been uprooted by strong wind lignified biomass is hence available

(Use of chainsaw is necessary and needed)

Secondary trees should be cut or pruned heavily and used for mulching/biomass.

Old coconuts that have been cut must be managed in accordance to MAF policy in controlling rhinos beatles.



New development where all the organic matter has to be used for mulching.



Mulching practice

Mulching of the new replanted trees and planting of living sticks of Erythrina was practices used.

The importance of the organic matter from banana was demonstrated by measuring the pH. The soil pH indicates a high acidity while the banana stem is highly alkaline. Rotten and transformed wood into soil was also measured (fig. 7), the pH was similar to banana stem, extreme alkaline. It is therefore possible to reduce the soil acidity by applying split banana stems around the young cocoa seedlings. Together with organic matter

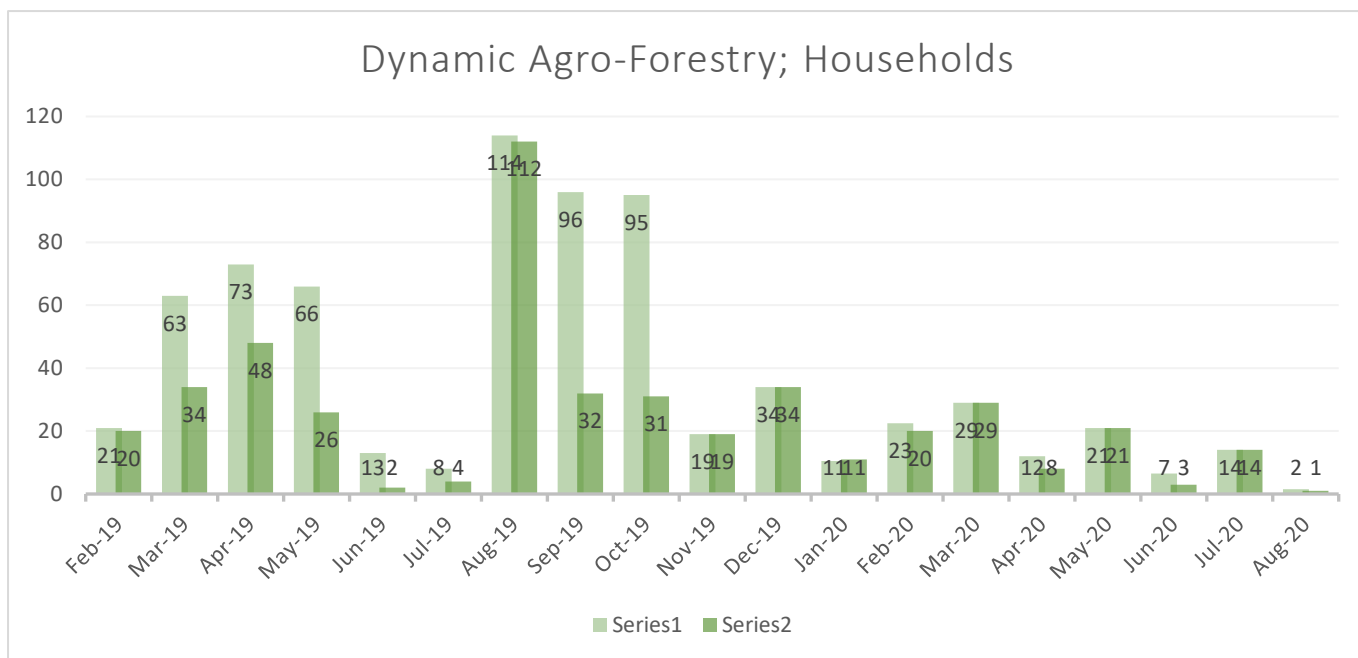
originated from cut grass and chopped branches it is possible to achieve an improvement of soil conditions even in the short term. In addition, the banana stem as well as the organic matter maintain humidity in the system.



Ongoing training amongst staff and farmers replanting. The importance of understanding of what each trees require and keeping the soil healthy.

4. ACTIVITIES & OUTPUTS:

Activity One: Establishment of DAF farming system	
Objective	(i) To continue working with Farmers in establishment of replanting (Dynamic Agro-Forestry) (ii) To expand and include how many household are benefiting from our project to maintain and sustain agriculture through replanting (iii) To instill the importance of DAF with trees/plants, with Farmers in terms of income generation and overall provision



Acreage established: 804 acreage (2.4acres = 1hectare) 804 /2.4 = 335Hectares	Potential extension 300
Total Number of families SCS work with: 630	Total Number of Villages SCS work with: 55
- Continue to strengthen the current trained Farmers to extend their plots - The total acreage are new ones as well as existing DAF plots that we've extended.	

Serendi Coco Samoa have established and worked with more than 50 villages in Samoa. (List of villages attached) where more than 600 households are benefited from this project.

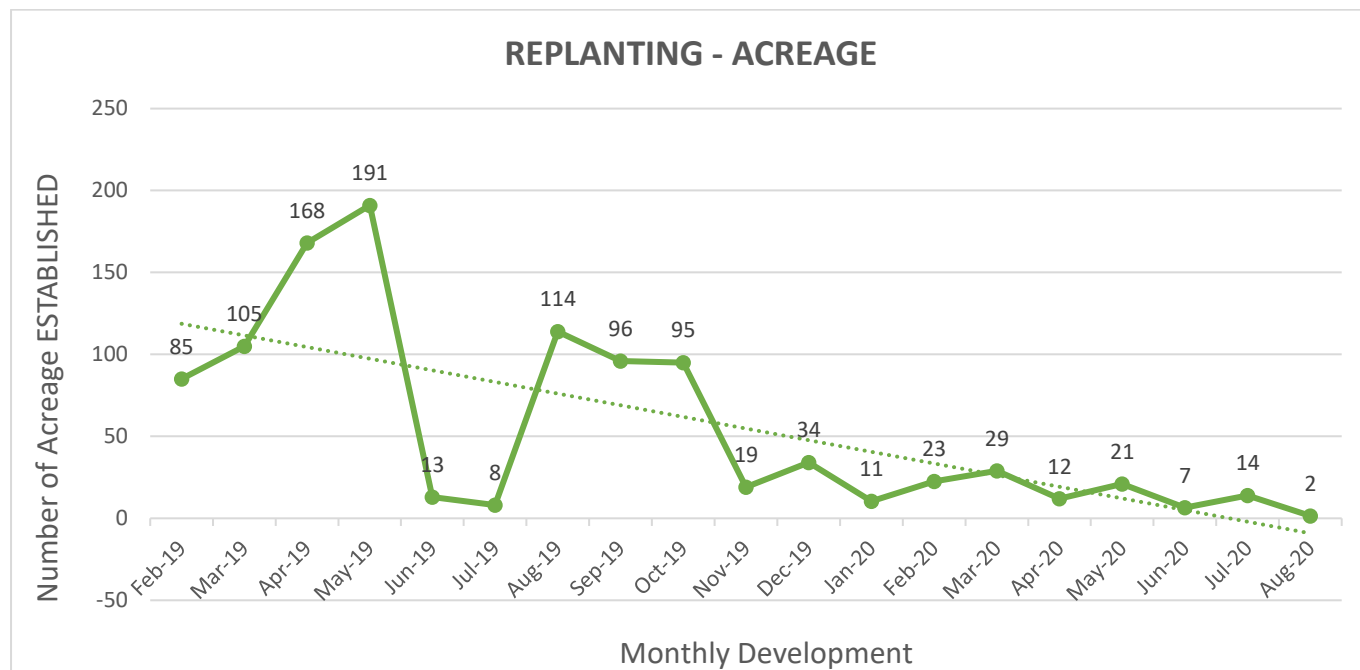


Activity Two: Distribution of seedlings to selected Farmers

Objective	(i) To continue to support the Farmers through distributing the seedlings (ii) To ensure seedlings are distributed and replanted in the proposed farming system
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Total:	Coconuts	Cocoa	Fruit Trees	Timber Trees
	34,407	76,047	3,675	6,642
January-19	8,106	14,285	1,290	1,390
February-19				
March-19	1,020	3,600	850	12
April-19	1,300	4,800	0	0
May-19	2,000	6,710	800	950
June-19	0	400	0	0
July-19	3,200	6,593	50	0
August-19	2,000	2,650	100	700
September-19	5,000	4,870	100	1,290
October-19	2,021	3,590	80	850
November-19	2,100	2,000	300	0
December-19	350	6,150	20	800
January-20	1,160	7,496	0	0
February-20	1,300	5,750	0	50
March-20	0	2,000	0	100
April-20	850	450	35	100
May-20	1,700	1,000	20	80
June-20	1,000	0	0	300
July-20	1,300	2,313	0	20
August-20	0	1,390	30	0

5. RESULTS:

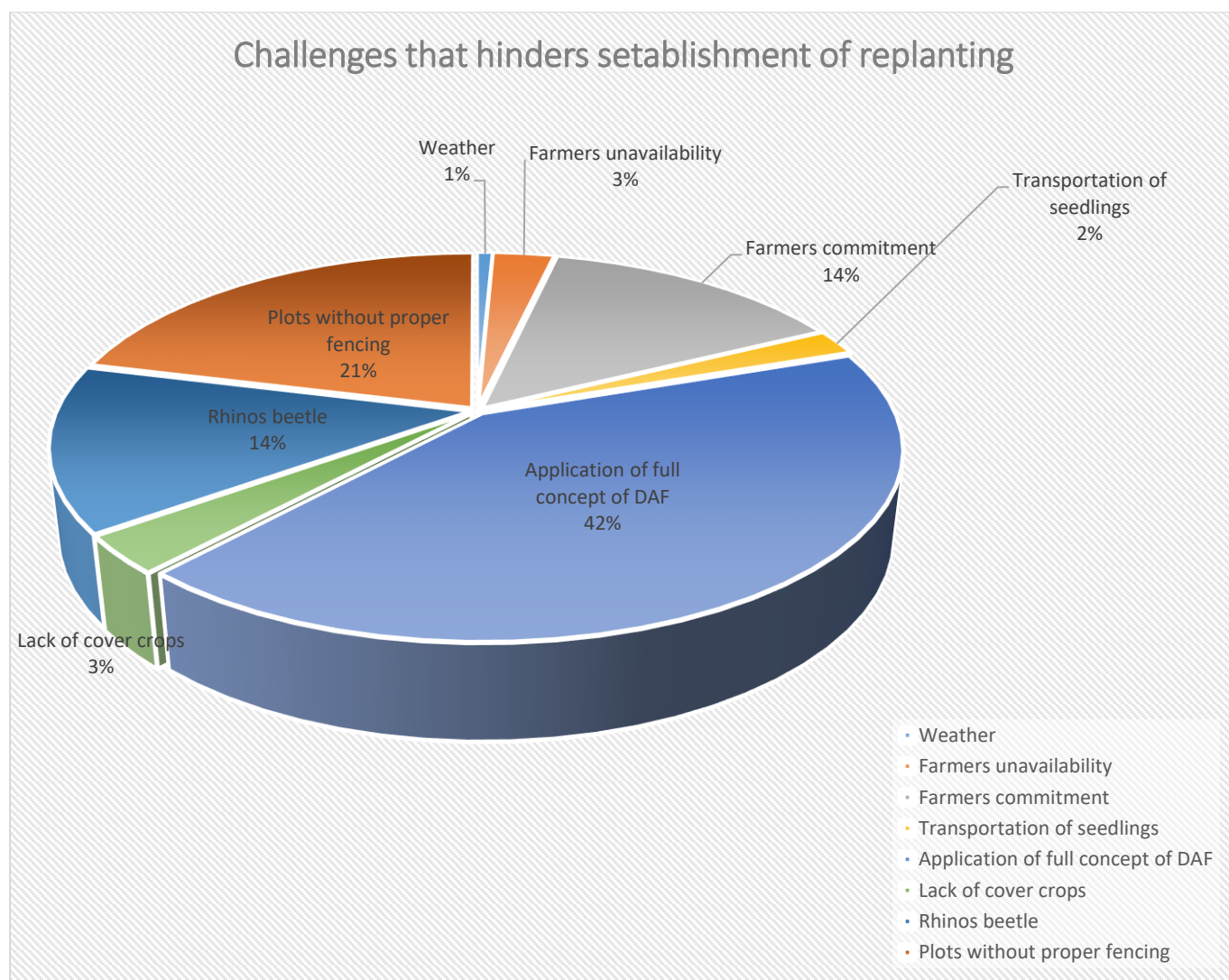


Total Acreage Established:	
Feb-19	85
Mar-19	105
Apr-19	168
May-19	191
Jun-19	13
Jul-19	8
Aug-19	114
Sep-19	96
Oct-19	95
Nov-19	19
Dec-19	34
Jan-20	11
Feb-20	23
Mar-20	29
Apr-20	12
May-20	21
Jun-20	7
Jul-20	14
Aug-20	2



Demonstration plot at Serendi Coco Samoa compound;

6. CHALLENGES & LESSONS LEARNED:



We continue to encounter the same challenges from month to month and we maintain our strategy to work with the Farmers.

The challenges remains the same throughout. However, Serendi Coco Samoa continues to work closely with the Farmers for the benefit of the dynamic agro-forestry.

CHALLENGES	LESSONS LEARNT	SOLUTION/STRATEGY ACTION
Seedlings availability	- SCS had established more than 300hectares which most of these with either one of the trees (coconuts, cocoa, fruit tree or timber). - MAF commitment to various project limits the capabilities as well as dealing with their Suppliers - SCS continues to strengthen the established plots as well as work with new Farmers who are showing interests in replanting.	- SCS works to the best of their ability to complete full concept of DAF unfortunately at times seedlings are not ready or being uplifted by another project, farmers or villages - Serendi Coco Samoa is asking to be one of the suppliers so we can assist MAF with raising the seedlings and continue to distribute as part of our initiative to sustainable agriculture.

CHALLENGES	LESSONS LEARNT	SOLUTION/STRATEGY ACTION
Lack of cover crops to complete the whole concept of Dynamic Agro-Forestry	a. Ensure that the Farmers agreed to terms and conditions that they (the farmers) provides the cover crops	a. Work with the Farmer to know what crops they would like to grow b. See what's available on the Farmer's farm c. See what crop with the potential market to introduce
Weather	a. Improvise to work around and/or work accordingly	a. Protective gears and assess the safety of workers and Farmers based on weather conditions b. Weather condition might help with replanting as long as Farmer is keen
Farmer's Unavailability during establishment	a. Farmers have other commitments to Family matters, church or villages	a. Plan and schedule to confirm suitable day and time for one zone and/or individual farmer, so SCS don't have to travel back and forth to one zone/village because one Farmer was not available b. Ensure that all Farmers have at least two (2) workers so they can continue to work with SCS team, thus allow them to continue the replanting
Farmer's commitment	a. Farmer's excitement is due to free distribution of seedlings b. Farmer's interests is driven by village competition or village visitation	a. Take advantage of the village group through utilizing authority of village council to motivate replanting amongst Farmers.
Transportation of seedlings	a. Availability of transport and drivers due to other planned work	a. Replanting team must provide at least monthly program so it fit in with the Transport Department schedule
Less interests in application of full concept of DAF	a. Farmers are not fully interested in applying full concept of DAF	a. Continue to work with the Farmers to understand the importance of such system b. Established 4 demonstration plot for the Farmers to use as an educational. Thus, provide more convincing on DAF farming system.
Rhinos beetles	a. Due to rhinos beetles affecting other farms, therefore these needs to delay the replanting process	a. Cooperation with MAF while they roll out a program to assist the farms affected by rhinos Beetles.
Pigs and cattle not fenced in	a. Newly established farms destroyed by pigs or cattle. b. Farms delay their replanting until their farms are fully fenced	a. Seek funding opportunities for farms for fencing b. Seek village council for all cattle and pigs MUST be fenced by families.

7. MONITORING – CONTINUOUSLY TO SUSTAIN REPLANTING PROGRAM:

A practical tool for monitoring, supervision, reporting and systemization of data has been established and it continues to become a living document for SCS Replanting team. Data collection is an important task to provide possibilities to evaluate it promptly, to access it and to be used to monitor the success of the program.

A person responsible for data have already been recruited within SCS within Internal Control System department. Thus her role includes assistance towards replanting team with data to guide them to evaluate the quality of DAF plots established.

According the principles and elements of DAF a category of criteria have to be assessed which

will be evaluated in **green (ok)**, **yellow (elements or management are still missing)** and **red (starting point)**

Step by step the number of plots in red should be converted in yellow and yellow plots in green.

GREEN

DAF plots established according the standard grid plus additional biomass species.

The management practices are realized according the instructions of the field officers

The following elements are present in at least 75% of the surface.

Pioneer species (life cycle < 1 year): beans, taro, corn, pumpkin, cassava, pigeon pea and others (only in year 1 and 2)

Secondary species (life cycle <80 years) : Banana, Noni and other native species, fruit trees like mango, avocado, rambutan and others, natural regeneration and biomass species planted by sticks like *Erythrina*, *Glyricidia* or others.

Primary tree species (life cycle >80 years: cacao, timber trees, natural regeneration

Understorey species:

Honolulu rose, turmeric especially are going incorporated to the establishment

YELLOW

- The elements that are listed above but not in the density according standard grid.
- Only scattered biomass species are present.
- Some elements are still missing (banana, 3rd storey trees) or biomass is not accumulated around the most demanding species
- Selective weeding is not done or in less than 50% of the surface



Mixture of coconut, cocoa, taro, eggplant, giant taro....

Natural regeneration is respected

Biomass is accumulated around the replanting trees.



Erythrina requires management and used as biomass

RED

It is supposed that the starting point is that only coconut and cocoa have been planted. However, the mortality of the replanted coconuts, cocoa, fruits must be assessed to determine if such plot is within this category for the team attend to.

- Short life cycle crops: haven't been planted
- Secondary species: Only scattered banana or some naturally regenerated trees are present.
- Primary species: no yet been planted
- No accumulation of biomass or partly done around some cocoa trees.
- No selective weeding is realized
- High mortality of cocoa was observed due to lack of protection when replanted. Some cocoa trees which are protected by other species developed quite well which shows the importance of shade.



Normal practice without mulching and cutting down trees to replant

8. CONCLUSION:

Serendi Coco Samoa continues to work with more than 500 families to establish, maintain and sustain dynamic agro-forestry replanting system. Thus, provide the farmer a fair contribution to a healthy environment in addition, this farming system provides a short and long term income generation to support their families. Supporting individual families, is supporting their villages, churches and our nation.

There's about 10% mortality of cocoa is the total expected and from observation where coconut is estimated no mortality so far recorded

We (SCS), have built nursery to continue our support to our communities with seedlings beyond project timeframe.

We will continue to monitor and work with our farmers.

We will continue to work collaboratively with Ministry of Agriculture and Fisheries to utilize the expertise within to execute our activities to the community.

The evaluation could be carried out in a participatory manner involving the community or Church involved in the project. In our experience, farmers feel motivated to improve their field from red to yellow or green when there is a particular social pressure and most importantly a consistency of visitation and/or niche market opportunity.



Nice development of starfruit in between coconut, cocoa and other trees



Nice development of avocado in between coconut, cocoa and other trees



Dynamic Agro-Forestry established plot is improving. Banana as well producing nice bunches.