

**IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES
IN TRINIDAD'S NORTHERN RANGE COMMUNITIES, ATN/ME-
11488-TT**

**Report on the provision of technical assistance to farmers towards
implementation of sustainable farming practices in the Maracas/ St.
Joseph and Caura/ Tacarigua Valleys**

TIME PERIOD JULY - AUGUST 2011



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1.0 INTRODUCTION

1.1 Background

An assessment of Trinidad's Northern Range completed in 2005 and published as the 2004 National State of the Environment Report for Trinidad and Tobago¹, concluded, among other things, that unregulated and unauthorized small-scale farming practices are becoming more evident throughout several of the watersheds of the Range. Such practices are driven by a number of socio-economic factors including land use policy and practices, and accelerated development of housing, which often work in combination.

While small-scale farming is a means of livelihood for several farmers (especially in rural areas) and it also plays a key role in local food production, it is becoming increasingly evident that unsustainable agricultural farming practices are part of the cause for downstream environmental impacts being experienced throughout Trinidad. The main impacts include an increase in the incidence and severity of flooding at the foothills of the Northern Range, especially in densely populated areas such as the capital city Port of Spain and in several towns along the East-West Corridor; and a disruption in potable water production by the watersheds of the Range. With the Northern Range is known to produce a large proportion of Trinidad's water supply, reductions in both the quality and quantity of potable water are beginning to have a national-level impact which is only expected to worsen in the foreseeable future.

In order to address the problem of unsustainable agricultural practices in the Northern Range and provide a model for reconciling socio-economic needs of hillside farming communities with environmental conservation, the Inter-American Development Bank (IDB) and The Cropper Foundation have designed and embarked on a project entitled **'Implementation of Sustainable Farming Practices in Trinidad's Northern Range Communities'**. The goal of this project is to pilot alternative farming practices in two watershed of the Northern Range - the Tacarigua/ Caura and Maracas/ St. Joseph watersheds - that can assist in improving the returns and sustainability of agriculture for small farmers while mitigating negative impacts on the environment and affected downstream communities. Specifically, this project seeks to: examine how to sustain livelihoods based on hillside agriculture within the Northern Range while protecting the resources of the ecosystem and alleviating downstream impacts; support the social and economic development of selected communities; collect valuable baseline information to facilitate present and future participatory applied research and analysis; and understand how to replicate the approach and disseminate learnt lessons stemming from the project.

The project's concern centers on five (5) main sources of impact, namely:

- a) Agricultural production (food)
- b) Community Governance and empowerment
- c) Landscape management (Biological impact)
- d) Demographic changes (settlement, tenure)

¹ Northern Range Assessment 2005. Report of an Assessment of the Northern Range, Trinidad and Tobago: People and the Northern Range. State of the Environment Report 2004. Environmental Management Authority of Trinidad and Tobago. 184pp.

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e) Watershed Maintenance

1.2 Objectives of this phase of the project

Having completed a baseline assessment of the farming and community profiles of the Maracas and Caura Valleys, designed an intervention model for the implementation of sustainable farming practices in both Valleys, and applied a high nature value index (HNVI) to farms in both Valleys, the EcoAgriCulture project and farmers within the Valleys are now at a point to begin field-testing viable approaches toward implementing sustainable farming practices. This consultancy is therefore designed to provide technical assistance to farmers in the two valleys for implementation of sustainable farming practices on their farms.

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2.0 REPORT ON CAURA VALLEY FARMERS

In the Caura/Tacarigua watershed area **twelve (12) farmers** completed the HNVI exercise in June 2011; see *Table 1* for HNVI scores for these farmers. On the commencement of this exercise the technical team visited these farmers to:

- ✚ Discuss and determine their current status in terms of farming activities
- ✚ Discuss their farming plans for the next 5 – 6 months
- ✚ Share HNVI scores with the farmers
- ✚ Offer the farmers information packages on a range of ecologically-friendly farming practices
- ✚ Explain this phase of the project and exchanging general information, for example on the Agricultural Development Bank (ADB) and products or services on offer, and the new incentive packages that The Ministry of Food Production, Land and Marine Resources (MFPLMR) has to offer farmers.

Table 1: HNVI Scores for Caura farmers (June 2011)

	Name	HNVI Score
1	Quddus Muhammad	74.5
2	Asha Sookdeo	69.0
3	Jahway Adams	61.0
4	Clement Tannis	57.0
5	Kevin Balgobin	52.5
6	Edmond Parmashwar	45.5
7	Naresh Ramcharan	40.0
8	Vivian Howard	39.0
9	Terrance Haywood	37.5
10	Krishna Heera	34.5
11	Deonarine Koopsammy	34.5
12	Harry Sonnilal	32.0

Source: Report on the administration of a questionnaire towards determining the High Nature Value Farming Index (HNVI) for participating Farmers in the watershed areas of Maracas/ St Joseph and Caura/ Tacarigua Valleys.

2.1 Current Farming Status

Out of the twelve (12) farmers interviewed in June 2011, nine (9) are currently actively farming, of which the technical field officer was able to visit seven (7); the other two farmers were contacted but never honoured their appointments.

In terms of inactive farmers, which accounted for three (3) out of the twelve (12), one was very ill, the other moved out of the area, and the other could not be contacted by phone.

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One new farmer was interviewed - Rajendra Ramcharan he is the current president of the Caura Valley Farmers Association (CVFA). Therefore this adjusts the list of active farmers in the Caura valley to ten (10); see *Table 2*.

Table 2: Current Status of Caura farmers in terms of farming activities August 2011

	Name of Farmer	Current Status August 2011 (In terms of farming activity)
1	Quddus Muhammad	Actively farming
2	Asha Sookdoo	Not actively farming although current secretary of the CVFA
3	Jahway Adams	Failed to honour meetings on at least three occasions
4	Clement Tannis	Actively farming
5	Kevin Balgobin	Actively farming
6	Edmond Parmashwar	Could not contact Mr. Parmashwar as current phone numbers are out of service
7	Naresh Ramcharan	Actively farming
8	Vivian Howard	Actively farming
9	Terrance Haywood	Actively farming
10	Krishna Heera	Actively farming
11	Deonarine Koopsammy	Currently very ill not actively farming
12	Harry Sonnilal	Mr. Sonnilal is considered a part time farmer as he has indicated that he is fully employed in non farming activities. Efforts to date to meet Mr. Sonnilal were futile.
13	Rajendra Ramcharan	Actively farming, and President of the CVFA

Source: Report of Field Visits to the Caura Valley; see *Annex 1*.

2.2 Current Views on ecologically-friendly farming Practices

During the month of August 2011 of the eight active farmers interviewed, two showed very little interest, while the other six showed strong interest in good ecological farming practices with varying levels of knowledge on ecological farming practices.

Table 3: Views on Ecologically Friendly Farming Practices by Active farmers in Caura

	Name	Comments
1	Quddus Muhammad	Very knowledgeable; interested; firmly believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
2	Clement Tannis	Very interested; believes in ecologically friendly farming practices; possesses some knowledge; and is

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		very eager to learn and implement any useful and practical practices.
3	Kevin Balgobin	Very interested; believes in ecologically friendly farming practices; possesses knowledge about eco-friendly farming practices; is interested in alternative remedies pest and diseases and the use of on farm regenerated/recycled inputs
4	Naresh Ramcharan	Somewhat interested and still debates the pros and cons of both systems. Has an open mind and is willing to learn.
5	Vivian Howard	Very interested; believes in ecologically friendly farming practices; possesses some knowledge; very eager to learn and implement any useful and practical practices.
6	Terrance Haywood	Very interested; believes in ecologically friendly farming practices; possesses some knowledge; very eager to learn and implement any useful and practical practices.
7	Kirshna Heera	Not interested in ecologically friendly practices as he convinced that his current 'green revolution ² ' practices are working for him and does not see the reason to change.
8	Rajendra Ramcharan	Not Interested and very apprehensive in implementing these techniques. Reasons for this include: that eco-friendly farming techniques can be very costly and time consuming to set up; his location is a problem, due to the surrounding farms which do not implement ecological practices and as such his efforts would result in failure.

Source: Report of Field Visits to the Caura Valley; see *Annex 1*.

2.3 Use of on farm generated ecologically friendly inputs

Out of the eight active farmers interviewed six (6) use some degree of on-farm generated inputs; see *Table 4* for details.

² The Green Revolution commenced in the mid twentieth century and involved very large Agro industrial cooperations / firms from first world countries developing varieties of crops (corn, soya etc). These developed varieties survival and productivity were solely dependant on very toxic fertilizers and pesticides produced by these very large Agro industrial cooperations / firms. The consequences of this period was significant damage to the environment (animal and plant life)

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Table 4: Use of on-farm generated ecologically friendly inputs by Active farmers in Caura

	Name	Comments
1	Quddus Muhammad	Uses grass clippings as a green manure Recycles on-farm generated crop residue and waste Uses on farm generated compost Uses marigold plants
2	Clement Tannis	Uses grass clippings as a green manure Uses marigold plants
3	Kevin Balgobin	Uses grass clippings as a green manure Recycles on farm generated crop residue Uses marigold plants
4	Naresh Ramcharan	Recycles of crop waste Uses marigold plants as an insect vector control
5	Vivian Howard	Uses grass clippings as a green manure Recycles on-farm-generated crop residue and waste Uses marigold plants
6	Terrance Haywood	Uses on-farm generated compost.
7	Krishna Heera	None
8	Rajendra Ramcharan	None

Source: Report of Field Visits to the Caura Valley; see *Annex 1*.

2.4 Use of off-farm ecologically friendly farm inputs

All eight (8) farmers practice the use of ecologically friendly external farm inputs. The most common being cured pen manure. This is a small positive step; however a much more holistic approach that incorporates the use of on-farm inputs to build and condition the soil is a more desirable end; see *Table 5*.

Table 5: Use of off- farm ecologically friendly farm inputs by Active farmers in Caura

	Name	Comments
1	Quddus Muhammad	Uses cured pen manure purchased off-farm. Uses phyton 27, New Fol cal and neemex. Eager to try other commercial eco friendly organic approved fertilizers and pesticides including homemade remedies.
2	Clement Tannis	Uses cured pen manure. Eager to use other commercial eco-friendly organic approved fertilizers and pesticides including homemade remedies.
3	Kevin Balgobin	Uses cured pen manure purchased off-farm. Uses phyton 27, New Fol cal and neemex. Eager to try other commercial eco friendly organic

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		approved fertilizers and pesticides including homemade remedies.
4	Naresh Ramcharan	Uses off-farm purchased cured pen manure only. Mr. Ramcharan shows very in incorporating the more expensive environmentally-friendly commercial organic approved fertilizers and pesticides.
5	Vivian Howard	Mr. Howard uses off-farm purchased cured pen manure. In addition, he uses phyton 27, New Fol cal and neemex (all three are organically certified). Mr. Howard has indicated that he is eager to try other commercial eco-friendly organic approved fertilizers and pesticides including homemade remedies.
6	Terrance Haywood	Uses off farm produced cured pen manure. Has shown an interest in trying other commercial eco-friendly organic approved fertilizers and pesticides including homemade remedies.
7	Krishna Heera	Uses off-farm produced cured pen manure but is happy with the results from his cocktail of highly toxic fertilizers and pesticides as far as it aids his current farm production.
8	Rajendra Ramcharan	Uses off farm produced cured pen manure. Willing to keep an open mind to the use of other commercial eco friendly organic approved fertilizers and pesticides including homemade remedies strongly dependant on cost.

Source: Report of Field Visits to the Caura Valley; see *Annex 1*.

2.5 Farm soil pH and liming of the soil

Out of the eight farmers interviewed, one farmer has done a soil test, none have applied limestone. It would be a useful exercise for all farmers to gain a benchmark of their soil by having a soil test done; see *Table 6*.

Table 6: Farm soil pH and liming of the soil by Active farmers in Caura

	Name	Comments
1	Quddus Muhammad	Farmer does not know the pH of his farm and has never applied lime to the soil; his use of a significant amount of ecologically friendly farm inputs has probably buffered his soil from acidification caused by the continuous use of inorganic fertilizers. Therefore, it is recommended that his soil be tested.
2	Clement Tannis	Farmer does not know the pH of his farm and has never applied lime to the soil; therefore it is recommended that this farmer conduct a soil test to ascertain the current

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		<p>status of his soil and utilize farming practices that reduce soil acidification Since his application of inorganic NPK fertilizers causes soil acidification.</p> <p>The technical team will keep on encouraging the use of more of ecologically friendly farm inputs that will assist in reducing soil acidification.</p>
3	Kevin Balgobin	Farmer does not know the pH of his farm and has never applied limestone to the soil; therefore it is recommended that this farmer conduct a soil test to ascertain the current status of his soil. Additionally he should utilize farming practices that reduce soil acidification, by significantly reducing the usage of NPK fertilizers and encouraging the use of more of ecologically friendly farm inputs.
4	Naresh Ramcharan	Farmer has never undertaken a soil test or applied limestone to his farm. He is a heavy user of NPK inorganic fertilizers which has probably led to soil acidification; therefore it is recommended that this farmer conduct a soil test to ascertain the current status of his soil even though visible signs may already exist.
5	Vivian Howard	Farmer does not know the pH of his farm and has never applied limestone to the soil; therefore it is recommended that this farmer conduct a soil test to ascertain the current status of his soil and utilize farming practices that reduce soil acidification, since he is a moderate user of NPK fertilizers which will have encouraged soil acidification. On the other hand the application of limestone and green manures and the use of compost will reduce soil acidification.
6	Terrance Haywood	Farmer has done a soil test but is hesitant to share the results. Limestone has never been applied to soil.
7	Krishna Heera	Farmer does not know the pH of his farm and has never applied lime to the soil; but the continuous use of inorganic fertilizers has probably led to soil acidification. Therefore it is recommended that this farmer conduct a soil test to ascertain the current status of his soil.
8	Rajendra Ramcharan	Farmer does not know the pH of his farm and has never applied lime to the soil; but the continuous use of inorganic fertilizers has probably led to soil acidification. Therefore it is recommended that this farmer conduct a soil test to ascertain the current status of his utilize farming practices that reduce soil acidification.

Source: Report of Field Visits to the Caura Valley; see *Annex 1*.

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2.6 Use of inorganic ecologically non friendly farm inputs

All eight farmers interviewed indicated that they use non-ecologically friendly farm inputs but the degree of usage in their farm plan varies; see *Table 7* for farmers' responses. The majority of farmers have indicated that they are willing to reduce the use of inorganic farm inputs, and therefore this project provides a timely intervention for increasing the farmers' knowledge base and hopefully influencing his choice of inputs.

Table 7 – The use of inorganic ecologically non friendly farm inputs by Active farmers in Caura

	Last Name	Comments
1	Quddus Muhammad	Due to his very limited use of these products, this farmer attained the highest HNV index score in the two valleys and definitely is on the right track. For example, instead of using the weedicide gramoxone, he uses his weed-whacker to remove weeds from his farm.
2	Clement Tannis	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
3	Kevin Balgobin	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
4	Naresh Ramcharan	This farmer has indicated that he is very satisfied with his use of NPK fertilizers, gramoxone and other non eco-friendly pesticides and his results obtained. Nevertheless, we will continue to share information with him, in an attempt to secure acceptance and adoption of sustainable farming practices.
5	Vivian Howard	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
6	Terrance Haywood	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
7	Krishna Heera	This farmer has indicated that he is very satisfied with his use of NPK fertilizers, gramoxone and other non eco-friendly pesticides and his results obtained. Nevertheless, we will continue to share information with him, in an attempt to secure acceptance and adoption of sustainable farming practices.
8	Rajendra Ramcharan	This farmer has indicated that he is very satisfied with his use of NPK fertilizers, gramoxone and other non eco-friendly pesticides and his results obtained. He is very knowledgeable about eco-friendly farming practices but has indicated that they are too costly to implement. We

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		will continue to share information with him, in an attempt to secure acceptance and adoption of sustainable farming practices.
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Source: Report of Field Visits to the Caura Valley; see *Annex 1*.

2.7 Current pest and disease challenges

Of the eight (8) farmers interviewed on pest and disease challenges identified, none appeared to have any significant current challenges. This may however, change during the rainy season, as the onset of high moisture and humidity create favourable conditions for the proliferation of fungal and bacterial pathogens. Upon further discussions and from observations, the farms that had a more diversified crop base including tree crops appeared to have a more balanced system and evidence of pest and diseases such as anthracnose, thrips and white flies appeared less apparent.

Table 8: Current pest and disease challenges experienced by Active farmers in Caura

	Name	Comments
1	Quddus Muhammad	The farmer had very few pest and disease problems; mainly the ants species bachac ³ . Strategies for reducing bachacs were discussed, such as the application of a strong mix of garlic tea.
2	Clement Tannis	Only significant problem identified was the bachac. He indicated that he tried a product called <i>fastac</i> but did not get the desired results. Strategies for reducing bachac populations were discussed, such as the application of a strong mix of garlic tea.
3	Kevin Balgobin	Indicated that he had a problem with white flies affecting his farm and indicated that the source was from the adjacent farm. Ideas and information on reducing white fly infestation were discussed.
4	Naresh Ramcharan	White fly, thrips and anthracnose were pests and disease problems identified; the farmer indicated that he prefers to utilize more eco-friendly products to counter his pest and disease problems. Therefore he requested information on ways to alleviate his pest and disease problems
5	Vivian Howard	Only significant problem identified was the bachac. He indicated that he tried a product called <i>fastac</i> but did not get the desired results. Strategies for reducing bachacs were discussed, such as the application of a strong mix of garlic tea.
6	Terrance Haywood	Currently, this farmer indicated that he experiences no pest and disease problems.
7	Kirshna Heera	This farmer has indicated that he is very satisfied with his

³ *Atta cephalotes* L. or *Acromyrmex octospinosus* Reich..

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		solutions to his pest and disease problems which center on using the non-environmentally friendly pesticides. At the same time he showed some interest in the information available on alternative solutions. Anthracnose and white flies were pest and diseases observed on his farm.
8	Rajendra Ramcharan	This farmer's preventative maintenance program for pest and disease involves the usage of non-environmentally friendly pesticides as a preventative measure (spray program). This farmer has indicated he has very little interest in utilizing the more eco friendly products to counter his pest and disease problems.

Source: Report of Field Visits to the Caura Valley; see *Annex 1*.

2.9 Plans and Challenges

Farmers face a range of challenges in farming. Some of these challenges include:

- ✚ Farm access and flooding
- ✚ Access to farm credit to expand their farming activities
- ✚ Access to the farmer incentive program offered by The Ministry of Food Production, Land and Marine Resources (MFPLMR)
- ✚ Irrigation and water resources
- ✚ Labor shortages
- ✚ Praedial larceny
- ✚ The dumping of waste on their farms
- ✚ Land tenure regularization

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Table 9: Challenges and Plans of farmers in Caura

	Last Name	Challenges	Plans to move their respective farms forward
1	Quddus Muhammad	Land tenure regularization.	Access incentives from the farmer incentive program offered by the MFPLMR.
2	Clement Tannis	Land tenure regularization.	Very interested in the farmer incentive program offered by the MFPLMR. In addition is in the process of applying for a loan to acquire a pick up vehicle to have greater control over his farms transportation needs particularly market access.
3	Kevin Balgobin	Land tenure regularization. Accessibility to and from his farm when heavy rains fall as the bridge leading to his farm is always flooded.	Very interested in the farmer incentive program offered by MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB.
4	Naresh Ramcharan	Labour, predial larceny and dumping of rubbish from external to Caura visitors. Land tenure regularization.	
5	Vivian Howard	Land tenure regularization.	Very interested in the farmer incentive program offered by the MFPLMR. Also, interested in expanding his farm activities with financial assistance from the ADB.
6	Terrance Haywood	Major concern on the Tumbasson side of Caura is that a central pond or water storage system be put in place to support a more efficient irrigation system to farmers in this area of Caura.	
7	Kirshna Heera	Land tenure regularization.	Very interested in the farmer incentive program offered by the MFPLMR.
8	Rajendra Ramcharan	Land tenure regularization.	Very interested in the farmer incentive program offered by the MFPLMR.

Source: Report of Field Visits to the Caura Valley; see *Annex 1*.

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3.0 REPORT ON MARACAS/ ST JOSEPH FARMERS

In the Maracas/ St Joseph areas **eighteen (18) farmers** completed the HNVI exercise in June 2011; HNVI scores for these farmers can be found in *Table 10*. On the commencement of this exercise the technical team visited these farmers to:

- ✚ Determine their current status in terms of farming activities
- ✚ Discuss their farming plans for the next 5 – 6 months
- ✚ Share their HNVI scores with the farmers
- ✚ Offer the farmers information packages on a range of ecologically-friendly farming practices
- ✚ Explain this phase of the project and exchanging general information, for example The Agricultural Development Bank (ADB) and products on services on offer, and the new incentive packages that The Ministry of Food Production, Land and Marine Resources (MFPLMR) has to offer farmers.

Table 10: HNVI Scores for Maracas/ St Joseph farmers (June 2011)

	Last	First	Score
1	Farrier	Holasco	60.0
2	Reyes	Andrew	57.5
3	Audain	Terrence	57.0
4	Sinanan	Cathryn	56.0
5	Herbert	Yusuff	47.5
6	Thompson	Leon	47.0
7	Mahabir	Arnand	46.5
8	Applewhite	Wayne	46.0
9	Hernandez	Trevor	45.5
10	Herbert	Bruce	44.5
11	Padillia	Ryan	44.5
12	Williams	Chad	44.0
13	Ramcharan	Winston	41.5
14	Gabriel	Steven	39.5
15	Bernard	Nigel	38.5
16	Applewhite	Kurn	37.0
17	John	Samuel	34.5
18	Walter	Dave	33.5

Source: Report on the administration of a questionnaire towards determining the High Nature Value Farming Index (HNVI) for participating Farmers in the watershed areas of Maracas/ St Joseph and Caura/ Tacarigua Valleys.

3.1 Current Farming Status

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Out of the eighteen (18) farmers interviewed in June 2011, twelve (12), are currently actively farming; the technical field officer was able to visit all the active farmers in the Maracas/ St Joseph watershed area.

In terms of the six inactive farmers, four (4) had alternative employment, one had land tenure issues, and one could not be contacted; see *Table 11*.

Table 11: Current Status of Maracas/ St Joseph farmers in terms of farming activities August 2011

	Last Name	First Name	Current Farming Status
1	Farrier	Holasco	Actively farming
2	Reyes	Andrea	Actively farming
3	Audain	Terrence	Actively farming
4	Sinanan	Cathryn	Actively farming
5	Herbert	Yusuff	Actively farming
6	Thompson	Leon	Actively farming
7	Mahabir	Arnand	Not actively farming took up a full time non-farming job
8	Applewhite	Wayne	Actively farming
9	Hernandez	Trevor	Not actively farming
10	Herbert	Bruce	Not actively farming
11	Padillia	Ryan	Actively farming
12	Williams	Chad	Actively farming
13	Ramcharan	Winston	Not actively farming
14	Gabriel	Steven	Not actively farming
15	Bernard	Nigel	Actively farming
16	Applewhite	Kurn	Actively farming
17	John	Samuel	No record of contact
18	Walter	Dave	Actively farming

Source: Report on Field Visits to the Maracas/ St. Joseph Valley; see *Annex 2*.

3.2 Current Views on ecologically friendly farming practices

During the month of August 2011 of the twelve active farmers interviewed, all showed strong interest with one declaring himself a self-expert.

Table 12: Current Views on Ecologically friendly farming practices

	Last	First	Comments
1	Farrier	Holasco	Somewhat knowledgeable and interested; firmly

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			believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
2	Reyes	Andrea	Somewhat knowledgeable and interested; firmly believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
3	Audain	Terrence	Somewhat knowledgeable and interested; firmly believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
4	Sinanan	Cathryn	Somewhat knowledgeable and interested; firmly believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
5	Herbert	Yusuff	Somewhat knowledgeable and interested; firmly believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
6	Thompson	Leon	Somewhat knowledgeable and interested; firmly believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
7	Applewhite	Wayne	Somewhat knowledgeable and interested; firmly believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
8	Padillia	Ryan	Somewhat knowledgeable and interested; firmly believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
9	Williams	Chad	Somewhat knowledgeable and interested; firmly believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
10	Bernard	Nigel	Somewhat knowledgeable and interested; firmly believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
11	Applewhite	Kurn	Somewhat knowledgeable and interested; firmly believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
12	Walter	Dave	Somewhat knowledgeable and interested; firmly

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			believes in ecologically friendly farming practices; realizes the financial, environmental and health benefits of such practices.
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Source: Report on Field Visits to the Maracas/ St. Joseph Valley; see *Annex 2*.

3.3 Use of on-farm generated ecologically friendly inputs by Active farmers in the Maracas/ St Joseph areas

Out of the twelve active farmers interviewed eleven (11) use at least one type of on-farm generated inputs, some as much as four; see *Table 13* for details.

Table 13: Use of on-farm generated ecologically friendly inputs by Active farmers in the Maracas St/ Joseph areas

	Last Name	First Name	Comments
1	Farrier	Holasco	Uses compost in addition to on-farm generated cured manure from his livestock operation
2	Reyes	Andrea	Uses compost, recycles crop residues as green manure and applies ash
3	Audain	Terrence	Uses compost
4	Sinanan	Cathryn	Uses compost, recycles crop residues as green manure and applies ash
5	Herbert	Yusuff	Uses compost, recycles crop residues as green manure / mulch
6	Thompson	Leon	Uses compost , recycles crop residues as green manure
7	Applewhite	Wayne	Recycles crop waste as green manure and utilizes compost.
8	Padillia	Ryan	No use of on-farm generated eco friendly farm inputs
9	Williams	Chad	Uses compost and marigold plants
10	Bernard	Nigel	Recycles crop residues as green manure
11	Applewhite	Kurn	Recycles crop waste as green manure and utilizes compost and marigold plants.
12	Walter	Dave	Uses compost, recycles crop residues as green manure and applies ash and marigold

Source: Report on Field Visits to the Maracas/ St. Joseph Valley; see *Annex 2*.

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3.4 Use of off-farm ecologically friendly inputs by Active farmers in the Maracas/ St Joseph areas

Out of the twelve active farmers interviewed ten (10) use some type of off-farm purchased eco friendly farm inputs. The most common being cured pen manure; see *Table 14* for details.

Table 14: Use of off-farm ecologically friendly inputs by Active farmers in the Maracas/ St Joseph areas

	Last Name	First Name	Comments
1	Farrier	Holasco	No use of off farm eco friendly inputs <u>but generates his own cured manure</u>
2	Reyes	Andrea	Has experimented with homemade products developed by combining inputs such as hibiscus, corn and peppers
3	Audain	Terrence	Uses off farm manure and phyton 27
4	Sinanan	Cathryn	Uses off farm manure
5	Herbert	Yusuff	Uses compost
6	Thompson	Leon	Uses limestone, neemex, phyton 27 and off-farm cured manure
7	Applewhite	Wayne	Uses off-farm cured manure, phyton 27, and neemex
8	Padillia	Ryan	No use of off-farm generated eco-friendly farm inputs
9	Williams	Chad	Uses off farm cured manure, new fol cal and phyton 27
10	Bernard	Nigel	Uses off-farm cured manure
11	Applewhite	Kurn	Uses off-farm cured pen manure and phyton 27
12	Walter	Dave	No use of off-farm eco friendly inputs

Source: Report on Field Visits to the Maracas/ St. Joseph Valley; see *Annex 2*.

3.5 Farm soil pH and liming of the soil

Out of the twelve (12) farmers interviewed, one (1) farmer has done a soil test and applies limestone, the others are willing to have their soil tested and if limestone is recommended they will have it applied to their respective farms.

Table 15: Farm soil pH and liming of the soil by Active farmers in Maracas/ St. Joseph

	Last Name	First Name	Comments
1	Farrier	Holasco	Not knowledgeable on the importance of soil

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			testing but will welcome a soil test.
2	Reyes	Andrea	Not knowledgeable on the importance of soil testing but will welcome a soil test.
3	Audain	Terrence	Currently experiencing soil fertility problems. He is requesting a soil test to guide his soil build up program but prior to the technical officer's intervention had very little knowledge of the importance of soil pH as it relates to soil nutrient availability.
4	Sinanan	Cathryn	Not knowledgeable on the importance of soil testing but will welcome a soil test.
5	Herbert	Yusuff	Not knowledgeable on the importance of soil testing but will welcome a soil test.
6	Thompson	Leon	Uses limestone in both farm systems namely grow box technology and open field rain fed production, and has a fair idea of the importance of soil pH as it relates to soil nutrient availability.
7	Applewhite	Wayne	Is knowledgeable on the importance of soil testing and will welcome a test carried out on his farm.
8	Padillia	Ryan	Not knowledgeable on the importance of soil testing but will welcome a soil test.
9	Williams	Chad	Is knowledgeable on the importance of soil testing and will welcome a test carried out on his farm.
10	Bernard	Nigel	Not knowledgeable on the importance of soil testing but will welcome a soil test.
11	Applewhite	Kurn	Not knowledgeable on the importance of soil testing but will welcome a soil test.
12	Walter	Dave	Not knowledgeable on the importance of soil testing but will welcome a soil test.

Source: Report on Field Visits to the Maracas/ St. Joseph Valley; see *Annex 2*.

3.6 Use of inorganic ecologically non friendly farm inputs

All twelve farmers interviewed indicated that they use non-ecologically friendly farm inputs but the degree of usage in their farm plan varies as the type of crop cultivated determines the amount of pesticides, herbicides and fertilizers applied and the subsequent damage including the timeframe for this damage to physically manifest itself. The majority of farmers have indicated that they are willing to reduce the use of inorganic farm inputs, and therefore this project provides a timely intervention for increasing the farmers' knowledge base and hopefully influencing his choice of inputs.

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**Table 16: The use of inorganic ecologically non-friendly farm inputs by Active farmers in the
Maracas/ St Joseph**

	Last Name	First Name	Comments
1	Farrier	Holasco	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
2	Reyes	Andrea	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
3	Audain	Terrence	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
4	Sinanan	Cathryn	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
5	Herbert	Yusuff	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
6	Thompson	Leon	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
7	Applewhite	Wayne	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
8	Padillia	Ryan	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
9	Williams	Chad	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
10	Bernard	Nigel	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
11	Applewhite	Kurn	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.
12	Walter	Dave	This farmer's use of NPK fertilizers, gramoxone and other non eco-friendly pesticides reflected in his low HNV index score.

Source: Report on Field Visits to the Maracas/ St. Joseph Valley; see *Annex 2*.

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3.7 Current Pest and Disease challenges in the Maracas St Joseph areas

Of the twelve (12) farmers interviewed on pest and disease challenges, all appeared to have 'moderate-controllable' challenges with pest and diseases. This may however, change during the rainy season, as the onset of high moisture and humidity create favourable conditions for proliferation of fungal and bacterial pathogens. Upon further discussions with farmers and from observations, the farms in the Maracas/ St Joseph area tend to have a more diversified crop base which includes an array of tree crops which would naturally lend itself to a more balanced system, and in that manner acts as a biological check for pest and disease problems. Some farmers also practice shifting cultivation which also assists in controlling pest and disease occurrences.

Table 17: Current pest and disease challenges experienced by Active farmers in Maracas/ St Joseph

	Last Name	First Name	Comments
1	Farrier	Holasco	This farmer has indicated no significant pest and disease problem
2	Reyes	Andrea	This farmer has indicated no significant pest and disease problem
3	Audain	Terrence	He indicated that his mother uses a mixture of garlic and pepper tea on her home garden, which is part of his farm. No challenges currently with pest and diseases.
4	Sinanan	Cathryn	This farmer has indicated no significant pest and disease problem
5	Herbert	Yusuff	This farmer has indicated no significant pest and disease problem
6	Thompson	Leon	This farmer has indicated no significant pest and disease problem
7	Applewhite	Wayne	This farmer has indicated no significant pest and disease problem
8	Padillia	Ryan	This farmer has indicated no significant pest and disease problem
9	Williams	Chad	This farmer has indicated no significant pest and disease problem
10	Bernard	Nigel	This farmer has indicated no significant pest and disease problem
11	Applewhite	Kurn	This farmer has indicated no significant pest and disease problem
12	Walter	Dave	This farmer has indicated no significant pest and disease problem

Source: Report on Field Visits to the Maracas/ St. Joseph Valley; see *Annex 2*.

3.8 Plans and challenges

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Farmers face a range of challenges in farming. Some of these challenges include:

- + Farm access and flooding
- + Access to farm credit to expand their farming activities
- + Access to the farmer incentive program offered by The Ministry of Food Production, Land and Marine Resources (MFPLMR)
- + Irrigation and water resources
- + Labor shortages
- + Praedial larceny
- + The dumping of waste on their farms
- + Land tenure regularization

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Table 18: Challenges and Plans of Active farmers in Maracas/ St Joseph

	Last Name	First Name	other challenges	Plans to move their respective farms forward
1	Farrier	Holasco	Land Tenure and better farm access	Very interested in the farmer incentive program offered by the MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB.
2	Reyes	Andrea	Land tenure regularization	Very interested in the farmer incentive program offered by the MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB
3	Audain	Terrence	Land tenure regularization	Very interested in the farmer incentive program offered by the MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB.
4	Sinanan	Cathryn	Land tenure regularization	Very interested in the farmer incentive program offered by the MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB.
5	Herbert	Yusuff	Land tenure regularization	Very interested in the farmer incentive program offered by the MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB.
6	Thompson	Leon	Land tenure regularization	Very interested in the farmer incentive program offered by the MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB.
7	Applewhite	Wayne	Land tenure regularization	Very interested in the farmer incentive program offered by the MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB.

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8	Padillia	Ryan	Land tenure regularization	Very interested in the farmer incentive program offered by the MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB
9	Williams	Chad	Land tenure regularization	Very interested in the farmer incentive program offered by the MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB.
10	Bernard	Nigel	Land tenure regularization	Very interested in the farmer incentive program offered by the MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB.
11	Applewhite	Kurn	Land tenure regularization	Very interested in the farmer incentive program offered by the MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB.
12	Walter	Dave	Land tenure regularization	Very interested in the farmer incentive program offered by the MFPLMR. Interested in expanding his farm activities with financial assistance from the ADB.

Source: Report on Field Visits to the Maracas/ St. Joseph Valley; see *Annex 2*.

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4.0 ACTIVITIES SCHEDULED FOR SEPTEMBER 2011

The technical team's program for the month of September 2011 would entail:

1. The distribution of organic inputs and a few small equipment items to the participating farmers in the program, some include:
 - a. Off-farm produced compost
 - b. Limestone
 - c. Organic certified foliar fertilizers
 - d. Granular and liquid organic certified fertilizers
 - e. Organic based and certified plant growth enhancers
 - f. Organic certified pesticides
 - g. Hoes, Shovels, machetes etc
2. The team would continue to share information on ecologically friendly farm practices and monitor if these discussions are being put into practice.
3. The technical team would try to assist in the areas of other challenges identified by the farmers in the two areas, particularly by interacting with the respective extension officers assigned to the Caura Valley and the Maracas/ St Joseph area.

4.1 Recommendations

A set of recommendations were devised for moving farms toward environmental and economic sustainability using the information gathered from the field visits to farmers and the results of the HNV indexing exercise. These recommendations will be discussed with farmers towards developing farming plans.

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Table 19: Specific Recommendations for Caura Farmers

	Name	Characteristic	Recommendations
1	Quddus Muhammad	No threat of soil erosion because the entire farm is covered with foliage	<p>Soil test should be undertaken to done to benchmark the soil's fertility status</p> <p>Continue to build his soil with adding green manure, cured manure and compost</p> <p>Encourage crop rotation and fallow practices as these are very important in maintaining soil fertility and structure.</p> <p>Try the garlic tea preparation to assist with the control of his bachac problem.</p> <p>Continue to reduce use of non eco friendly pesticides, fertilizers and herbicides. These can be replaced with more eco friendly input options presented to him by the technical team.</p> <p>Work with extension officer to regularize his land tenure status and access the incentive program to assist in building the asset base of his farm.</p>
2	Clement Tannis	Cultivation on rolling landscape since the entire farm is covered in foliage and he spot plants on the contours; he has no threat of soil erosion	<p>Continue to incorporate much more green manure, cured manure and compost to build his soil</p> <p>Soil test should be undertaken to done to benchmark the soil's fertility status</p> <p>Try the garlic tea preparation to assist with the control of his bachac problem. Significantly reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to him by the technical team.</p> <p>Work with extension officer to regularize his land tenure status and access the incentive program to assist in building the asset base of his farm.</p>
3	Kevin Balgobin	Cultivation on flat land which is mostly covered with foliage therefore no threat of soil erosion	<p>Continue to incorporate much more green manure, cured manure and compost to build his soil</p> <p>Soil test should be undertaken to done to benchmark the soil's fertility status</p> <p>Significantly reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to him by the technical team.</p> <p>Work with extension officer to regularize his land tenure status and access the incentive program to assist in building the asset base of his farm.</p>
4	Naresh Ramcharan		Continue to dialogue with farmer on ecologically friendly farming practices

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5	Vivian Howard	Cultivation on rolling landscape since the entire farm is covered in foliage and he spot plants on the contours he has no threat of soil erosion	Continue to incorporate much more green manure, cured manure and compost to build his soil Soil test should be undertaken to done to benchmark the soil's fertility status Try the garlic tea preparation to assist with the control of his bachac problem. Significantly reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to him by the technical team. Work with extension officer to regularize his land tenure status and access the incentive program to assist in building the asset base of his farm..
6	Terrance Haywood ⁴	Cultivation on rolling and flat landscape since the entire farm is covered in foliage and he spot plants on the contours; no threat of soil erosion	Continue to incorporate much more green manure, cured manure and compost to build his soil Significantly reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to him by the technical team. Encourage Mr. Haywood should continue to make representation to have ponds developed on the Tumbasson road side to assist with irrigation.
7	Kirshna Heera		Continue to dialogue with farmer on ecologically friendly farming practices
8	Rajendra Ramcharan		Continue to dialogue with farmer on ecologically friendly farming practices

Table 20: Specific Recommendations for Maracas/ St Joseph Farmers

	Last	First	Recommendations
1	Farrier	Holasco	Continue to incorporate more green manure, cured manure and compost to build his soil Work with extension officer to regularize his land tenure status and access the incentive program to assist in building the asset base of his farm. Significantly reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to him by the technical team.

⁴ Past Member of the Board of the Agricultural Development, member of the task force that reviewed the agricultural incentives to farmers and senior member of the National Food Crop Farmers Association

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			Soil test should be undertaken to done to benchmark the soil's fertility status , particularly since he has livestock in his program which besides enhancing soil structure and fertility also raise soil pH levels or make them more alkaline.
2	Reyes	Andrea	Continue to incorporate much more green manure, cured manure and build her compost to build her soil's physical and chemical status Work with extension officer to regularize his land tenure status and access the incentive program to assist in building the asset base of his farm. Continue to significantly reduce the usage of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to her by the technical team. Soil test should be undertaken to done to benchmark the soil's fertility status
3	Audain	Terrence	Soil test should be undertaken to done to benchmark the soil's fertility status Continue to incorporate much more green manure, cured manure and compost to build his soil since he is aware he has a soil fertility problem Work with extension officer to regularize his land tenure status and access the incentive program to assist in building the asset base of his farm. Reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to him by the technical team.
4	Sinanan	Cathryn	Continue to incorporate more green manure, cured manure and build her compost to build her soil's physical and chemical status Work with extension officer to regularize her land tenure status and access the incentive program to assist in building the asset base of his farm. Continue to significantly reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to her by the technical team. Soil test should be undertaken to done to benchmark the soil's fertility status
5	Herbert	Yusuff	Continue to incorporate much more green manure, cured manure and start a compost heap to build his soil condition Soil test should be undertaken to done to benchmark the soil's fertility status

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			<p>Work with extension officer to regularize his land tenure status and access the incentive program to assist in terracing, irrigation and drainage development on his farm to facilitate his farm expansion plans whilst at the same time encouraging soil conservation.</p> <p>Continue to reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to him by the technical team.</p>
6	Thompson	Leon	<p>Continue to incorporate much more green manure, cured manure and start a compost heap to build his soil condition</p> <p>Work with extension officer to regularize his land tenure status and access the incentive program for assistance on his farm with respect to the grow box program and any other incentives that would assist his farm to build its asset base. Continue to significantly reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to him by the technical team.</p> <p>Soil test should be undertaken to done to benchmark the soil's fertility status</p>
7	Applewhite	Wayne	<p>Continue to share information on ecologically friendly farming practices</p> <p>Arrange a meeting with the project's technical coordinator Dr. Allan Williams,</p> <p>Share the agricultural incentives program with farmer</p>
8	Padilla	Ryan	<p>Continue to incorporate much more green manure, cured manure and compost to build his soil</p> <p>Work with extension officer to regularize his land tenure status and access the incentive program to assist in building the asset base of his farm.</p> <p>Significantly reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to him by the technical team.</p> <p>Soil test should be undertaken to done to benchmark the soil's fertility status</p>
9	Williams	Chad	<p>Continue to incorporate much more green manure, cured manure and start a compost heap to build his soil condition</p> <p>Work with extension officer to regularize his land tenure status and access the incentive program to assist in building the asset base of his farm.</p> <p>Significantly reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these</p>

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			<p>with more eco friendly input options presented to him by the technical team.</p> <p>Soil test should be undertaken to done to benchmark the soil's fertility status</p>
10	Bernard	Nigel	<p>Continue to incorporate much more green manure, cured manure and start a compost heap to build his soil condition</p> <p>Work with extension officer to regularize his land tenure status and access the incentive program to assist in building the asset base of his farm.</p> <p>Significantly reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to him by the technical team.</p> <p>Soil test should be undertaken to done to benchmark the soil's fertility status</p>
11	Applewhite	Kurn	<p>Continue to incorporate much more green manure, cured manure and compost to build his soil</p> <p>Work with extension officer to regularize his land tenure status and access the incentive program to assist in building the asset base of his farm.</p> <p>Significantly reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to him by the technical team.</p> <p>Soil test should be undertaken to done to benchmark the soil's fertility status</p>
12	Walter	Dave	<p>Continue to incorporate much more green manure, cured manure and compost to build his soil</p> <p>Work with extension officer to regularize his land tenure status and access the incentive program to assist in terracing, irrigation and drainage development on his farm since he plans to establish some short term crops on his farms steep slopes over the next two months.</p> <p>Significantly reduce the use of non eco friendly pesticides, fertilizers and herbicides. Replace these with more eco friendly input options presented to him by the technical team.</p> <p>Soil test should be undertaken to done to benchmark the soil's fertility status</p>

**IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES
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Annex 1

**Report on the activities and implementation of sustainable
farming practices of participating Farmers in the and Caura/
Tacarigua Valley**



Submitted by: Shango Alamu

Date: September 08, 2011

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Executive Summary

The objective of the exercise was to share with the farmers their High Nature Value (HNV) indices and to give some explanation of their scores, to set the stage for the distribution of information on ecologically friendly farming practices and to be appraised of their current status of production and projections for the rest of this production cycle. It was also intended to introduce some eco-friendly strategies they may not have been familiar with for possible introduction into their programs.

Based on previous interactions on the project most of the farmers had a good understanding of the NHV concept and were willing to make the necessary transformation to improve their scores. In this regard they welcomed the opportunity to receive information on improving their farming practices. Their status of production varied from holdings still in abandonment, through lands now being prepared, to fully operational projects. Some farmers are engaged in conservation agriculture especially as regards soil conservation. However the use of toxic pesticides, herbicides and mineral fertilizers is still very popular.

Farmers shared with the consultant their major concerns in making the transition particularly how the changes would impact on farm productivity and the availability of an alternate suite of inputs. However farmers were willing to experiment even to make changes to their existing farm plans as appropriate information became available.



Natural Vegetation of the Maracas Valley

Photo Credit: Shango Alamu

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Introduction: Because of the continued interactions from the inception of the relationship with The Cropper Foundation and the introduction of the project idea, the level of enthusiasm remains high among farmers in the Maracas Valley. In every instance they were willing to share ideas and look forward to this implementation phase of the project. They seem to have bought in the philosophy of sustainable agricultural production and welcome the opportunity to be a part of the movement. During the visit it was stressed that to be successful it required a cultural change as the various strategies involved cannot work in isolation. Definitely it must not be viewed as input substitution but must be seen as creating an all inclusive environment for eco-friendly management systems including even social and governance components. An important contributor to the success of this relationship is the role the Maracas Valley Farmers Association is playing for they were very useful in making the linkages with farmers and in reality their representatives have accompanied the consultant on all visits to date.

Objective: The objective of the exercise was indeed achieved in that on every encounter there was an extensive discussion on high nature valley farm activities and its role on sustainability, on each farmer's current status and on developing an approach to improve their HNV index. Farmers were also willing to share details of their farming program. In this regard what was significant was the fact that they are prepared to experiment even to incorporate new ideas in their current program or to compare them in separate research plots. On the question of being supplied with information, the farmers were excited. They found some difficulty in having to choose from the wide range of documents in each sustainable farming information category. They were advised that they should at least begin by selecting documents in areas which impacted negatively on their HNV index.

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Farming programs of individual farmers

Experience has demonstrated that meeting farmers in the Maracas valley is indeed a challenge related to:

- The scattered nature of the farms; farming is practiced from the Riverside Road in the south, to the hills above the Lluengo village approximately 10 miles to the North
- The inaccessibility; in most cases one can only reach the holding via a hike along hilly terrain
- The part time nature of farm activities in the valley; most farmers compliment their farm incomes with income from other activities.

Thus in the interest of meeting reporting deadlines in some instances interactions were on a basis of off-farm discussions and as such are based on the farmer's word.

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Name: Kurn Applewhite

Location: Maracas Royal Road

Soil Management Plan: This farmer is already into the production and use of compost, off-farm manure and recycles crop waste. He does some ploughing by hand.

Suggested HNV-Compatible inputs: Of the recommended listing as earlier stated the farmer uses compost and manure. However he is willing to try the others once they are available

Structural Components: in this regard the farmer does some terracing and contour drains. He also uses raised beds to facilitate drainage. He has two ponds established on his holding. He uses moon cycle rotation for establishing crops.

Crop Management Plan: The farmer does some observation of the soil and crop health but has no real schedule. He currently does no soil testing but would welcome the opportunity to do some microbiological and mineral analysis. Although not currently keeping records, he indicated that he plans to begin.

Crop Management Inputs: Of the inputs suggested the farmer uses Phyton and the insect repellent marigold.

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Name: Terrance Audain

Location: San Pedro Road

This farmer produces on a hillside and is essentially into plantain⁵ production with plans to intercrop with hot peppers. He is attempting organic production but is currently facing some problems which seem to be soil related. He indicated that the affected area was previously into short term production for a number of years and as such there may be a fertility or soil bore disease situation.

Soil Management Plan: The farmer uses compost and some off-farm manure. He intends to increase the use of manure for his plantains. Considering the possible problem with the soil he is enthusiastic about learning of the effects of limestone with the possibility of including liming in his soil management plan. He does some hand ploughing.

Land Preparation Plan: As earlier stated he uses compost and manure and is willing to try the other HNV-compatible products listed if available. He indicated that his mother uses a mixture of garlic and pepper tea on her home garden with positive results.

Structural Components: Although not practicing terracing he recognizes its importance in his hillside production system and would like to begin. He dose short term production on raised beds and would like to incorporate other structural components such as water channeling, path separators and sheet composting in his management system. He indicated that he recently started using moon cycle rotation in his program.

Crop Management Plan: Currently the farmer does some casual soil and crop health observations but would like to get his soil tested. He indicated that he does some record keeping and is now beginning to do some crop yield comparisons.

Crop Management Inputs: Of the inputs suggested he uses Phytol 27. He stated that he would use the others if available.

⁵ Scientific names for crops are included as Annex 1

IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES IN TRINIDAD'S NORTHERN RANGE COMMUNITIES, ATN/ME- 11488-TT

Name: Trevor Hernandez

Location: San Pedro Road

This farmer is not currently into active production but has a semi-abandoned coffee and cocoa estate. He has a plan for developing an agro-eco-tourism project which would include re establishment of a range of forest trees, fruit trees, medicinal herbs, a wild animal sanctuary and hiking trails. He further stated that he would like to begin some banana and plantain production. A major deterrent he indicated was an infestation of bachac ants (*Atta cephalotes* and *Acromyrmex octospinosus*) which makes the establishment of any plant a real challenge.

Soil Management Plan: Based on the current status of the farmer's program all these activities are projections. He did recognize the importance of composting and the use of limestone. He indicated that his would be a non-till operation.

Land Preparation Plan: Of the suggested HNV-compatible inputs he was willing to utilize them if available. He stated that some like ash, compost and manure were previously used. He further stated that he had experimented with the use of some other "bush" insecticides.

Structural Components: The farmer indicated that terracing was inherent in earlier production systems. He called them traps and stated that they used different types of materials including logs and stones to create these traps. He further stated that they made check dams with stones in some of the ravines in which they established appropriate crops in the slush gathered. The use of compost was also recognized.

Crop Management Plan: As with other farmers there was some casual observation of soil and crop health and comparison of crop yields but no records were kept.

Crop Management Inputs: Again of the suggested inputs, the farmer was willing to try if available.

IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES IN TRINIDAD'S NORTHERN RANGE COMMUNITIES, ATN/ME- 11488-TT

Name: Cathryn Sinanan

Location: Acono Road

This farmer is essentially into short term rain fed production although there is some long term and medium term crops such as Gros Michel banana and plantain. The management of unwanted vegetation is done either manually or through the use of mulches. There is some companion planting and crop rotation. The farmer further indicated that pest and disease management is based on an agro eco system analysis.

Soil Management Plan: The farmer has some established compost heaps, recycles crop waste and has plans to use some off-farm manure. Pumpkin serves as a cover crop. She practices non-till production.

Land Preparation Plan: Of the suggested HNV-compatible inputs, she uses compost and ash and would use the others if available.

Structural Components: The farmer has plans to do some terracing and path separators and uses moon cycle rotation for crop establishment.

Crop Management Plan: The farmer does some casual observation of soil and crop health and would do some soil and microbiological testing if available. No formal record keeping is done.

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Name: Dave Walters

Location: Lluengo Village

This farmer has a mix of long, medium and short term crops produced under hillside conditions. He is currently clearing additional land for extending his short term program.

Soil Management Plan: His is essentially a non-till operation. He indicated that he does some composting, uses off farm manure and other soil amendments and recycles his crop waste.

Land Preparation Plan: The farmer stated that he at times uses ash, compost and manure in his preparation. Of the other HNV-compatible inputs recommended he indicated that he is willing to incorporate them in his management plan if available.

Structural components: Although operating on steep hillside, besides having a portion of his allotment under continuous tree cover, he does not implement any other soil conservation practices. He stated that terracing was very labor intensive but was considering establishing water channels, path separators and doing some sheet composting. He indicated that he uses moon cycle rotation for crop establishment.

Crop Management Plan: The farmer does not maintain any crop records but does some casual observations of his soil and crop health. He indicated that he would like to get his soil tested and was contemplating keeping records.

Crop Management Inputs: Of the suggested inputs he stated that he used only marigold. He did indicate however that he would use the others if available.

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Name: Ryan Padilla

Location: La Grind Road

This is not a full time operation as the farmer has an alternative means of livelihood. He is primarily into long term crop production. His main crop is limes. He does a limited amount of intercropping with short terms such as peppers.

Soil Management Plan: This is a non-till operation on hilly terrain. The farmer stated that he uses off-farm manure and has tried using limestone.

Land Preparation Plan: The farmer indicated that although he is not currently into the use of the HNV-compatible inputs suggested he is willing to use them if available.

Structural Components: The farmer stated that he uses raised beds for ginger production and uses moon cycle rotation for plantain production. Of the other structural components recommended he indicated that he is willing to try water channeling.

Crop Management Plan: The farmer has no structured monitoring plan. He does some casual observations of crop health and indicated that he has some projection for keeping records.

Crop Management Inputs: The farmer stated that he is not currently into the use of the suggested products but is willing to incorporate them into his program if available.

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Name: Andrea Reyes

Location: Riverside Road

This farmer is into hillside short term production of a broad range of crops which includes seim, string beans, sweet peppers, carili and bigan. She indicated that she practices rotating her crops.

Soil Management Plan: The farmer indicated that she uses compost, plants pumpkin at times because of its soil covering value and recycles her crop waste. All ploughing is done by hand.

Land Preparation Plan: Besides the use of compost she is not currently into the use of the HNV compatible inputs suggested but is willing to try them.

Structural Components: The farmer uses some raised beds for producing her crops and plants by the moon.

Crop Management Plan: The farmer has no structured crop monitoring plan but indicated that she keeps records at times. She further stated that she would like to get her soil tested.

Crop Management Inputs: The farmer stated that she is willing to try the products suggested. She indicated that she has experimented with homemade products developed by combining inputs such as hibiscus, corn and peppers.

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Name: Nigel Bernard

Location: Lluengo Village

The farmer is currently into short term crop production having established beans and ochro but plans to produce bigan, peppers and pumpkins and some medium terms such as pigeon peas, plantains and bananas. His is hillside cultivation. He plants essentially rain fed and rests the land during the dry season at which time he may cut the grass several times and leave it to biodegrade. He indicated that he practices crop rotation.

Soil Management Plan: His is a non-till operation. The farmer recycles his crop waste and uses off-farm manure. He does pumpkins at times which have the dual value of covering the soil for a somewhat extended period of time and providing some produce.

Land Preparation Plan: In his land preparation the farmer indicated that he sometimes uses a mixture of ash and fertilizers together with manure. He also indicated that he is willing to incorporate the other HNV-compatible products suggested in his program.

Structural Components: Recognizing its value, terracing is now a component of the farmer's future projections. He indicated that he does some channeling to control run-off and intends to construct a dam for storage. He uses raised beds only for seedling production. He has some path separators to afford easy access and crop management. The farmer uses moon cycle rotation for crop establishment.

Crop Management Plan: The farmer indicated that he keeps records as a monitoring tool. This is particularly useful he reasoned in comparing crop yields. He stated that he does regular observation of the soil and crop health and his management interventions are based on these observations. All management of unwanted vegetation is done manually. He plans to do some soil testing.

Crop Management Inputs: On the management inputs suggested the farmer indicated that he is willing to incorporate them into his program if available.

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Name: Holasco Farrier

Location: Buena Vista St Joseph

This is a mixed farming operation with both crop and livestock components. As regards the crops, the farmer is into vegetable crop production which includes, cow pea, cabbage, chive, pakchoi, peppers and pimentos and long terms of which the main crop is coconut. The farmer has also established cedar trees. As regards the livestock the farmer rears goats, sheep and cows. The terrain is hilly but there are flat portions.

Soil Management Plan: The farmer uses compost and manure in his soil preparation. All ploughing is done manually.

Land Preparation Plan: Although not currently into the use of many of the suggested HNV-compatible products the farmer indicated that he had no problem in incorporating them into his program

Structural Components: The farmer indicated that he uses raised beds for his short term crop production and plants by the moon.

Crop Management Plan: As with other farmers there is need for much work to be done in this area. The time consuming nature of this activity has been advanced for the casual approach.

Crop Management Inputs: The farmer is willing to incorporate these products in his program if available.

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Name: Chad Williams

Location: La Baja

This farm is a mixed crop initiative. The farmer operates at several locations some on hillside and one on gentler terrain closer to home. Currently peas, sorrel and sweet peppers are established and there are projections for planting tomatoes. The farmer is also interested in undercover production and is seeking information on this approach.

Soil Management Plan: The farmer does some composting but not on a large scale. This is used essentially for home gardening. The farmer uses limestone. On the hillside it is a non till operation. The farmer indicated that the land in the vicinity of the home is at times rested but during this period it is cleared and sprayed with herbicide as a rodent and mosquito control strategy.

Land Preparation Plan: The farmer stated that he has used New Fol Cal SL. Of the other inputs suggested he stated that he is willing to try them.

Structural Components: The farmer does not practice many of the techniques suggested. He stated that he has done some terracing but not extensively. He also indicated that he establishes crops in rows with wide enough furrows to afford easy access and easy management.

Crop Management Plan: Again observations are casual and no proper records are kept, although the farmer indicated that he would like to. He stated however that his spray program is based mainly on observations of crop health. In some instances preemptive spraying is done and in severe pest and disease situations spraying may be done on a calendar basis. He stated that fertilizing is done mainly by nutrient solution.

Crop Management Inputs: Mainly conventional pesticides are used although the farmer stated that he has used phyton 27 and at one time had established marigold plants.

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Name: Bruce Herbert/Yusuff Herbert

Location: Lluengo Village

This farm currently consists mainly of long term crops although the farmer has done extensive short term cropping on bench terraces in the past. Currently the long terms dominate as the shade has become too intense to accommodate the short terms. The main activity at this time is brush cutting the cut grass being left as mulch. The farmer intends to open new areas for his cash crop program. The farmer stated that he would like to terrace the land before establishing crops. He further stated that he does not intend to open too large a parcel at one time as a strategy to reduce the possibility of soil loss particularly as we are in a rainy period of the year. The natural cover and the bench terraces serve to prevent soil loss in the established areas. The farmer is very conscious of restricting the removal of biomass from the farm.

Soil Management Program: All the land preparation is done by hand. On new areas if terraces are not formed it is a non till operation. The farmer has done some composting but not on a large scale.

Land Preparation Plan: Most of the suggested inputs have not been used but the farmer is willing to incorporate them in his program.

Structural Components: This farmer truly appreciates the need for soil conservation. He has benched his allotment, has established path separators and intends to use terraces at some point on freshly cleared land. He indicated that he also has been advising others to practice similar techniques particularly where the land is very steep. He has a projection to establish at least one pond. He also plants by the moon.

Crop Management Plan: Again there is no structured monitoring approach or record keeping. However the farmer indicated that he is always in observation mode monitoring changes in the ecology and devising appropriate strategies for correcting adverse changes.

Crop Management Inputs: This farmer is not into heavy pesticide usage. Unwanted vegetation is managed mainly by brush cutting. He uses some herbicide but rarely in cultivated areas. He is willing to use the suggested products if available. He indicated that he has used neem in the past.

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Farmer Bruce Herbert



Stone Barrier used to check soil loss



Pathway leading to higher elevation



Bench Terraces on the Hillside

Photo credits: Shango Alamu

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Name: Leon Thompson

Location: La Baja Road

This farmer produces mainly vegetable crops at two locations near his home where he practices grow-box culture year round irrigating in the dry season and on the hillside where he produces rain fed in the wetter period of the year. As a conservation practice on the hillside he shifts cultivation at times resting parcels for as long as ten years. He protects rested parcels from forest fires by establishing fire trails.

Soil Management Plan: The hillside activity is essentially non-till. He uses off-farm manure but not from commercial sources avoiding manure with hormones and antibiotics. As earlier stated he rests the land for extensive periods during which time grass and other vegetative materials become naturally incorporated into the soil. In the grow-boxes the farmer tills the media between crops. He also uses manure and incorporates limestone.

Land Preparation Plan: The farmer uses some compost and manure in his grow-boxes and is willing to try other HNV-compatible inputs.

Structural Components: Because of the shifting nature of his farm program the farmer does not experience significant soil loss. Also his is essentially a non-till operation. Thus based on his experience the farmer does not think that operations such as terracing is necessary, also he plants in rows across the hill facilitating access and farm operations.

Crop Management Plan: The farmer stated that he observes his crops and soil and management interventions are to an extent based on these. He has not done any soil testing. As regards record keeping again this is seen as necessary but is not practiced.

Crop Management Inputs: The farmer said that he has used neem and Phyton and is willing to try the others suggested.



Celery produced in grow boxes

Photo Credit: Shango Alamu

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Concluding remarks

To achieve our desired objective of sustainable farming practices in the Northern Range requires a concerted effort even full time work among the farming community. In the Maracas Valley it is particularly challenging for we are here dealing with production on hillsides at times on small acreages on very steep terrain and programs include in most instances short term crop production.

As regards philosophy, farmers in the Valley recognize the need for transitioning to sustainable farming methodologies for ensuring that the ecosystem continues to provide the services critical to maintaining their livelihoods as farmers and in addition their domestic, social and recreational desires. There is still however a gap between recognition and adoption at the ground level as some of their current practices and future projections indicated. Not in all instances soil conservation measures are in place even on steep hillsides and toxic pesticide usage is still popular. Perhaps the limiting consideration is that transitioning poses some livelihood challenges associated with the risks involved and the human and financial resources needed. What is positive though is that they are willing to incorporate introduced concepts in their farm programs even if at an experimental level. They were very eager to receive information on the strategies required to make the change but it is still a bit unclear as to whether they fully appreciate that it must be a cultural change and not one of substituting inputs. In our interactions we must continue to propagate the idea that the various strategies cannot work in isolation. What is of further interest is that there are farmers in the valley who are practicing conservation farming either using conventional or developed systems.

Despite the challenges it is an interesting project for it could truly test our capacity to influence change in an ecosystem critical to environmental sustainability on a national level. Our results could also be very instructive in agricultural planning as so many Northern Range farming communities utilize similar systems of production.



Companion planting using corn and peas as an intercrop

Photo credit: Shango Alamu

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ANNEX 1: Scientific names of crops

Banana – *Musa acuminata*
Barbadine – *Passiflora quadrangularis* L.
Carailli – *Momordica charantia*
Chive - *Allium schoenoprasum*
Coconut – *Cocos iucifera*
Cowpea - *Vigna unguiculata*
Cucumber – *Cucumis sativus*
Hot Pepper – *Capsicum annuum*
Lime – *Citrus aurantifolia*
Mango – *Mangifera indica*
Melongene – *Solanum melongena*
Ochro – *Abelmoschus esculentus*
Papaya – *Carica papaya*
Patchoi – *Brassica rapa*
Peas - *Cajanus cajan*
Pimento – *Pimenta dioica* Mycataceae
Plantain – *Musa paradisiaca*
Pumpkin – *Cucurbita maxima*
Sorrel - *Rumex acetosa*
Sweet pepper – *Capsicum annuum*
Tomato - *Solanum lycopersicum*

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Annex 2

**Report on the activities and implementation of sustainable
farming practices of participating Farmers in the watershed
areas of Maracas/ St Joseph Valley**



**Submitted by:
Richard Guy**

**Date Submitted:
6th September, 2011**

IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES IN TRINIDAD’S NORTHERN RANGE COMMUNITIES, ATN/ME- 11488-TT

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INTRODUCTION

Background

An assessment of Trinidad's Northern Range completed in 2005 and published as the 2004 National State of the Environment Report for Trinidad and Tobago⁶, concluded, among other things, that unregulated and unauthorized small-scale farming practices are becoming more evident throughout several of the watersheds of the Range. Such practices are driven by a number of socio-economic factors including land use policy and practices, and accelerated development of housing, which often work in combination.

While small-scale farming is a means of livelihood for several farmers (especially in rural areas) and it also plays a key role in local food production, it is becoming increasingly evident that unsustainable agricultural farming practices are part of the cause for downstream environmental impacts being experienced throughout Trinidad. The main impacts include an increase in the incidence and severity of flooding at the foothills of the Northern Range, especially in densely populated areas such as the capital city Port of Spain and in several towns along the East-West Corridor; and a disruption in potable water production by the watersheds of the Range. With the Northern Range is known to produce a large proportion of Trinidad's water supply, reductions in both the quality and quantity of potable water are beginning to have a national-level impact which is only expected to worsen in the foreseeable future.

In order to address the problem of unsustainable agricultural practices in the Northern Range and provide a model for reconciling socio-economic needs of hillside farming communities with environmental conservation, the Inter-American Development Bank (IDB) and The Cropper Foundation have designed and embarked on a project entitled '**Implementation of Sustainable Farming Practices in Trinidad's Northern Range Communities**'. The goal of this project is to pilot alternative farming practices in two watersheds of the Northern Range - the Tacarigua/Caura and Maracas/ St. Joseph watersheds - that can assist in improving the returns and sustainability of agriculture for small farmers while mitigating negative impacts on the environment and affected downstream communities. Specifically, this project seeks to: examine

⁶ Northern Range Assessment 2005. Report of an Assessment of the Northern Range, Trinidad and Tobago: People and the Northern Range. State of the Environment Report 2004. Environmental Management Authority of Trinidad and Tobago. 184pp.

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how to sustain livelihoods based on hillside agriculture within the Northern Range while protecting the resources of the ecosystem and alleviating downstream impacts; support the social and economic development of selected communities; collect valuable baseline information to facilitate present and future participatory applied research and analysis; and understand how to replicate the approach and disseminate learnt lessons stemming from the project.

The project's concern centers on five (5) main sources of impact, namely:

- a) Agricultural production (food)
- b) Community Governance and empowerment
- c) Landscape management (Biological impact)
- d) Demographic changes (settlement, tenure)
- e) Watershed Maintenance

Objectives of this phase of the project

Having completed a baseline assessment of the farming and community profiles of the Maracas and Caura Valleys, designed an intervention model for the implementation of sustainable farming practices in both Valleys, and applied a high nature value index (HNVI) to farms in both Valleys, the EcoAgriCulture project and farmers within the Valleys are now at a point to begin field-testing viable approaches toward implementing sustainable farming practices. This consultancy is therefore designed to provide technical assistance to farmers in the two valleys for implementation of sustainable farming practices on their farms.

This report is based on visits made to the individual farmers, observations of their farming practices and an introduction to sustainable farming practices.

IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES IN TRINIDAD'S NORTHERN RANGE COMMUNITIES, ATN/ME- 11488-TT

Date: 31/8/11

Name of Farmer: Kevin Balgobin

Address of Farmer: Concordia Road, Caura

Date of Visitation: 9/08/11

Mr. Balgobin has on the field (at the time of the visit) patchoi⁷, sweet pepper, hot pepper and tipitambo. He has an average idea of the advantages of sustainable farming practices and is very interested in the implementation of these practices. He has even begun to use some of these methods which includes the use of the marigold plant as a pest deterrent, the use of compost and cured off farm manure. Mr. Balgobin is also aware of the benefits of planting in the correct stage of the lunar cycle and utilizes the Mc Donald's calendar to assist him with this. He also has intentions of setting up a green house which he believes will be much easier to implement even more sustainable farming practices under a controlled environment.



Photo 1: Melongene plants on Kevin Balgobin's Farm

Photo Credit: Richard Guy

Mr. Balgobin welcomes the program and assures me of his willingness to utilize the techniques involved in sustainable farming practices. He was also enthusiastic about the bulletins available to him. The topics he requested information on are:

- i. learning from nature
- ii. cultivating good soil
- iii. increase soil organic matter using organic remedies
- iv. dense vegetation can protect the soil
- v. soil quality indicators
- vi. making soils more fertile
- vii. improve your soil's fertility

⁷ The scientific names of the crops are included as *Annex 1*.

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- viii. crop diversity for nutrient management
- ix. crop rotation.

Mr. Balgobin's major pest problem is that of whiteflies coming in from an adjacent field of cabbage. He uses fastac (inorganic pesticide) for this. A more ecologically friendly pesticide can be recommended.

Signed

Date

IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES IN TRINIDAD'S NORTHERN RANGE COMMUNITIES, ATN/ME- 11488-TT

Date: 31/8/11

Name of Farmer: Naresh Ramcharan

Address of Farmer: Plot 14 & 15 Caura Royal Road, Caura

Date of Visitation: 8/08/11

Presently Mr. Ramcharan has on the field melongene, carailli, pimento and cucumber. He is aware of some of the advantages of a more eco-friendly approach to agriculture. He seems very interested in the program, the techniques being promoted and he himself has implemented some of these sustainable farming techniques. These include the use of cured off farm manure, recycling of crop waste and the use of the marigold plant as an insect vector control. He also utilizes pest control products such as Nemex, Phyton 27 and fertilizers such as New Fol Cal SL (all organic in nature). His fairly low HNVI score (40) was due to the use of NPK fertilizers (inorganic in nature) and weedicides such as gramoxone. He has also expressed interest in acquiring information and learning more about sustainable farming practices. His areas of interest are:

- i. structure of quality soils
- ii. how significant is mulching
- iii. increase soil organic matter
- iv. using organic remedies
- v. soil quality indicators
- vi. more on soil quality indicator categories
- vii. making soils more fertile improve your soil's fertility
- viii. crop diversity for nutrient management
- ix. crop rotation.

The main problem being experienced by Mr. Ramcharan is that of midge.

Signed

Date

Date: 31/8/11

IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES IN TRINIDAD'S NORTHERN RANGE COMMUNITIES, ATN/ME- 11488-TT

Name of Farmer: Vivian Howard

Address of Farmer: Plot 19 Tumbason Road, Caura

Date of Visitation: 3/08/11

Mr. Howard is currently farming barbadine, citrus, papaya and pumpkin. He practices spot planting. The terrain of the field is slightly sloping, and he uses cover crops to reduce the effects of direct rainfall on the soil in order to reduce erosion. He also recycles crop waste back into the soil to maintain fertility.



Photo 2: Barbadine plants on Vivian Howard's farm

Photo Credit: Richard Guy

Mr. Howard showed a lot of interest in this program and expressed his willingness to participate. Acknowledging his low score (41.5)

and the reasons for it, Mr. Howard vows to adopt the techniques which will facilitate sustainable agriculture.

Mr. Howard admits that he has limited knowledge in sustainable farming practices. This can be seen by his use of chemicals such as gramoxone. Never the less, he is willing to change his techniques along these lines. He was grateful for the bulletins available and requested information in the topics:

- i. structure of quality soil
- ii. how significant is mulching
- iii. increase soil organic matter
- iv. using organic remedies
- v. soil quality indicators
- vi. produce more biomass
- vii. synthetic or mineral fertilizers
- viii. supplying nutrients in organic material
- ix. stretch your farm inputs
- x. crop rotation.

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He has even suggested a workshop as to educate farmers like himself and promote a more eco-friendly approach to agriculture. His main pest problem is that of ants.

Signed

Date

IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES IN TRINIDAD'S NORTHERN RANGE COMMUNITIES, ATN/ME- 11488-TT

Date: 31/8/11

Name of Farmer: Quddus Muhammad

Address of Farmer: Tumbason Road, Caura

Date of Visitation: 3/08/11

Currently Mr. Muhammad has on the field bananas, plantain, and ochro. He plans to plant pumpkin and hot pepper in the near future. Mr. Muhammad had the highest HNVI score of all the farmers visited, and the reasons were evident when visiting his farm. Mr. Muhammad is very knowledgeable of the benefits of sustainable farming practices. He uses very little chemical fertilizers (NPK), instead opting for the use of compost. Also, all his weed control is done manually and with the use of a weed-whacker. Mr. Muhammad also uses the marigold plant as an insect vector control. It was also interesting to note that he used a few ochro plants to suppress a large bamboo stool on his farm.



Photo 3: Banana Trees on Quddus Muhhammad's Farm

Photo Credit: Richard Guy

He welcomes and embraces the program and was very keen to acquire even more knowledge via the information bulletins available. His areas of interest thus far include:

- i. learning from nature
- ii. the constraints of mulching
- iii. increase soil organic matter
- iv. using organic remedies
- v. how to prevent soil erosion
- vi. construction against soil erosion
- vii. nature adds nitrogen to the soil
- viii. managing nitrogen needs
- ix. understanding moon cycle
- x. guide to planting by the moon

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Signed

Date

**IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES
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Date: 31/8/11

Name of Farmer: Harry Persaud Sonnilal

Address of Farmer: Plot #4, Caura Valley Road, Caura

Mr. Sonnilal is employed full time. Over the last month he indicated to me that he would have been available on the 13th of August. A meeting was arranged for this date but Mr. Sonnilal did not honour this appointment. Since then he has been unavailable for another scheduled meeting. Further efforts will be made in the future to meet with Mr. Sonnilal.

Signed

Date

IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES IN TRINIDAD'S NORTHERN RANGE COMMUNITIES, ATN/ME- 11488-TT

Date: 31/8/11

Name of Farmer: Terrence Haywood

Address of Farmer: Plot #2, Tumbason Road, Caura

Date of Visitation: 3/08/11

Presently Mr. Haywood has pumpkin planted on the field. Generally, he welcomes the program and indicates his willingness to utilize even more of the techniques. In interacting with Mr. Haywood, he seems to be very knowledgeable and aware of a lot of techniques where sustainable farming practices are concerned. He also had a good understanding of the benefits of this approach. Mr. Haywood has implemented the use of compost and cured off farm manure.



Photo 4: Pumpkin plants on Terrence Haywood's Farm

Photo Credit: Richard Guy

Some of his weed control is done manually. He also uses Neem oil and fungicides such as Phyton 27, both of which are organic in nature. He has implemented soil testing in the last six months. Despite all of this, Mr. Haywood had a relatively low HNVI score of 34.5.

After further interaction with him, I discovered some of the reasons for his low score. His use of NPK fertilizers and gramoxone as a weedicide certainly contributed to his low score. Mr. Haywood was very interested in acquiring information via the bulletins available. Topics requested thus far include:

- i. structure of quality soils
- ii. how significant is mulching
- iii. increase soil organic matter
- iv. using organic remedies
- v. soil quality indicators
- vi. more on soil quality indicators
- vii. making soils more fertile

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- viii. nutrients from organic matter
- ix. crop rotation and guide to planting by the moon.

Signed

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Date: 31/8/11

Name of Farmer: Deonarine Koopsammy

Address of Farmer: Plot 6, Concordia Road, Concordia, Caura

Date of Visitation:

Mr. Koopsammy's wife indicated to me that her husband has a health problem and therefore is inactive and would not be able to meet with me.

Signed

Date

IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES IN TRINIDAD'S NORTHERN RANGE COMMUNITIES, ATN/ME- 11488-TT

Date: 31/8/11

Name of Farmer: Krishna Heera

Address of Farmer: Plots #5, 20, Caura Royal Road, Caura

Date of Visitation: 9/08/11, 15/08/11

Mr. Heera presently cultivates four acres of papaya. These trees are three years old and he proudly boasts of continued high yields. He attributes these yields to a strict fertilization spray regime which includes chemicals such as blaukorn, calnitro and NPK fertilizers (all inorganic in nature). He displayed little interest in crop rotation and the use of manure. Because of his "high yields" it was difficult to convince Mr. Heera that his techniques were not sustainable. As a result of his practices, it was easy to see why he had



Photo 5: Papaya trees on Krishna Heera's Farm

Photo Credit: Richard Guy

a low HNVI score. Despite all of this Mr. Heera did indicate that he was willing to try some of the more eco-friendly fertilizers once made available to him. He also showed some interest in the information available to him. These topics were:

- i. Structure of quality soils
- ii. Cultivating good soil
- iii. Retaining water in the soil
- iv. Using organic remedies
- v. Soil quality indicators
- vi. more on soil quality indicator categories
- vii. Nature adds nitrogen to the soil
- viii. making soils more fertile
- ix. Understanding the moon cycle
- x. Guide to planting by the moon.

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Mr. Heera indicated that his main problem was that of flooding. A bridge was constructed close to his field; the problem is the bore of the bridge is too small for the volume of water that flows along that channel in times of persistent rainfall. Therefore, the excess water overflows and finds its way into Mr. Heera's field. Evidence of this was seen where part of his field was destroyed as result of this flooding.

Signed

Date

**IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES
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Date: 31/8/11

Name of Farmer: Edmond Parmmashwar

Address of Farmer: Plot 34, Caura Royal Road, Caura

Date of Visitation:

The telephone numbers provided by Mr. Parmmashwar are of order; numerous attempts have been made to contact him to no avail.

Signed

Date

**IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES
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Date: 31/8/11

Name of Farmer: Jahway Adams

Address of Farmer: Tumbason Road, Caura

Date of Visitation:

On three different occasions Mr. Adams failed to honour our scheduled meetings. These meeting dates were 6th, 11th and 18th of August. Another meeting will be scheduled with Mr. Adams in the near future.

Signed

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Date: 31/8/11

Name of Farmer: Clement Tannis

Address of Farmer: Tumbason Road, Caura

Date of Visitation: 3/08/11

Mr. Tannis has a good understanding and appreciation of sustainable farming practices. He was very interested in the program and seems very keen on participating. Presently, Mr. Tannis has more long-term type crops planted. These include citrus, mango and coconut. Also on the field were banana and plantain. He was aware of the benefits of an ecological approach to agriculture and so has implemented some of these ecologically friendly techniques. Mr. Tannis makes use of off-farm manure and most of the weed control is done manually. He also showed interest in incorporating 'hay' into the soil as a fertility medium. Mr. Tannis has also implemented the use of compost, and uses the marigold plant as an insect vector control. He also displayed a fair understanding of the benefits of crop rotation and insists on this practice. He requested information on the following topics:

- i. structure of quality soils
- ii. why use mulch
- iii. increase soil organic matter
- iv. using organic remedies
- v. soil quality indicators
- vi. how to prevent soil erosion
- vii. making soils more fertile
- viii. improve your soils fertility
- ix. crop diversity for nutrient management
- x. crop rotation.

He indicated to me that ants were his major pest problem and uses the pesticides - pestac and fastac (both inorganic in nature) which obviously affected his HNVI score negatively. He enquired about a more eco-friendly solution to this problem.

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Since the majority of his field is sloping, his main problem is that of soil erosion. There is an obvious lack of terracing and drainage as to limit the effects of this.

Signed

Date

**IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES
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Date: 31/8/11

Name of Farmer: Asha Sookdeo

Address of Farmer: Cachipal Road, Cachipal Caura

Date of Visitation:

Ms. Sookdeo is presently employed full time and is currently inactive as a farmer. Because of her full time employment, she was unable to meet with me since she does not reside in the Caura area. She referred me to the President of the Caura Farmer's Association, Mr. Rajendra Ramcharan.

Signed

Date

IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES IN TRINIDAD'S NORTHERN RANGE COMMUNITIES, ATN/ME- 11488-TT

Date: 31/8/11

Name of Farmer: Rajendra Ramcharan

Address of Farmer: Caura Royal Road, Caura

Dates of Visitation: 8/08/11, 16/08/11

Mr. Ramcharan is the President of the Caura Farmer's Association, therefore it was important to get him on board where this project is concerned. Mr. Ramcharan displayed a vast knowledge of a lot of the benefits associated with sustainable agricultural practices. Despite his knowledge, Mr. Ramcharan was very apprehensive in implementing these techniques, insisting that in his present situation, these techniques are doomed to fail. Firstly he indicated that an



Photo 6: Cucumber plants on Rajendra Ramcharan's Farm

Photo Credit: Richard Guy

entire biological system is costly and time consuming to set up; money and time that he does not have. Secondly, he made the point that his location is a problem. He raised the concern that if his neighbours (surrounding farms) do not implement this same ecological approach, his efforts would be in vain.

Mr. Ramcharan also indicated to me that he has participated in similar programs in the past with no success. Because of this, he seems very difficult to convince and getting him on board poses a challenge.

Signed

Date: 31/8/11

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Name of Farmer: Arnand Mahabir

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Address of Farmer: Curepe River Road, St. Joseph Village

Date of Visitation:

Mr. Mahabir is employed full time. As a result he is inactive as a farmer and was unable to meet with me.

Signed

Date

IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES IN TRINIDAD'S NORTHERN RANGE COMMUNITIES, ATN/ME- 11488-TT

Date: 31/8/11

Name of Farmer: Steven Gabriel

Address of Farmer: Maracas Royal Road, Peppe Village, Maracas

Date of Visitation: 14/08/11

Presently Mr. Gabriel has land tenure issues. As a result he is currently inactive as a farmer. Despite this, he was very interested in the program and indicated his willingness to adopt some of the techniques associated with sustainable farming practices once his land issues are sorted out. He also was very grateful for the bulletins available and requested information on the following topics:

- i. learning from nature
- ii. cultivating good soil
- iii. kingdom of roots
- iv. using organic remedies
- v. soil quality indicators
- vi. produce more biomass
- vii. making soil more fertile
- viii. nutrients from organic matter
- ix. crop diversity for nutrient management
- x. using companion plants.

Mr. Gabriel also indicated to me that he was aware of the benefits of a more eco friendly approach to agriculture and in the past utilized some of these techniques like the use of compost, recycling crop waste and the use of off farm manure.

Signed

Date: 31/8/11

Date

IMPLEMENTATION OF SUSTAINABLE FARMING PRACTICES IN TRINIDAD'S NORTHERN RANGE COMMUNITIES, ATN/ME- 11488-TT

Name of Farmer: Wayne Applewhite

Address of Farmer: 4B La Grind Road, Acono, Maracas Valley

Date of Visitation: 14/08/11

Having lectured at the Farmer's Training Center (FTC), Mr. Applewhite is very well informed where sustainable agricultural practices are concerned. This was evident from interacting with him and looking at his farm. He utilizes a lot of the techniques associated with sustainable farming practices. These include the use of off farm manure and recycling of crop waste to increase soil fertility. His farm is located on a hillside. Because of this, Mr. Applewhite has set up an effective and attractive water channeling and contour system. He also practices crop rotation as to maintain soil fertility. Because of all of this, it was difficult initially to understand his fairly low HNVI score (46), but further discussions with him showed that he uses weedicides such as gramoxone and other chemicals which clearly plummeted his score. He did not accept his HNVI score and what it represented. He thought that it was not a true reflection of his practices.

Generally, he thought that the program was not applicable to him since he already has the knowledge and in his opinion, implementing the techniques. He was very hesitant in accessing any of the bulletins available and only requested a few; insisting that the information wasn't necessary. The topics selected were:

- i. learning from nature
- ii. cultivating good soil
- iii. increase soil organic matter
- iv. using organic remedies.

Signed

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ANNEX 1: Scientific names of crops

Banana – *Musa acuminata*

Barbadine – *Passiflora quadrangularis* L.

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Carailli – *Momordica charantia*

Coconut – *Cocos iucifera*

Cucumber – *Cucumis sativus*

Hot Pepper – *Capsicum annuum*

Lime – *Citrus aurantifolia*

Mango – *Mangifera indica*

Melongene – *Solanum melongena*

Ochro – *Abelmoschus esculentus*

Papaya – *Carica papaya*

Patchoi – *Brassica rapa*

Pimento – *Pimenta dioica* Mycataceae

Plantain – *Musa paradisiaca*

Pumpkin – *Cucurbita maxima*

Tipitambo – *Maranta arundinacea*

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Annex 2: Report on Field Visits to the Maracas/ St. Joseph Valley