VEEP/VS EbA Training Programme Opening

Overview Intro to VEEP, Vetiver Grass and Plant Preparation

Canaries, Saint Lucia

18th August 2021

IAMovement

www.iamovement.org | www.vetivertt.com

Contents

- *VEEP VS EbA Training Programme Introduction*
- *Intro to IAMovement + Vetiver TT EES Ltd*
- *Vetiver Education & Empowerment Project (VEEP) Model*
- *Saint Lucia VEEP/VS Training Activities Agenda*
- *Vetiver Grass Introduction + Plant Preparation*

BE A PART OF THE SOLUTION

Join The EbA Project in St Lucia!

Do you face challenges of soil movement, erosion or land slippage effecting your property, agricultural land, or infrastructure?

Join the 2-week Vetiver training and field implementation programme in Canaries!

Four (4) days per week
17th August - 27th August

For more info contact:

Coslene Simon

1 (758) 484 - 2197

David Henry

1 (758) 284 - 3223

-Incentives Available-

@GrassRoots4lavie

CARIBBEAN IICA IAMOVEMENT UF

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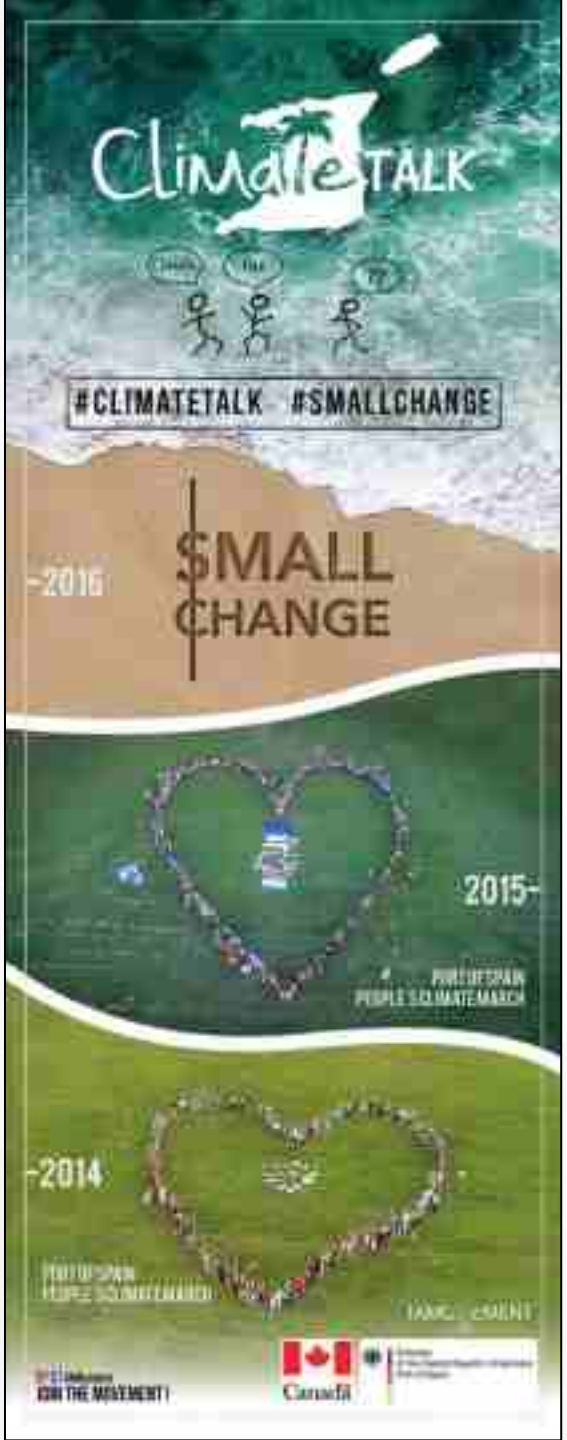
ClimateTALK
#CLIMATETALK #SMALLCHANGE
2016
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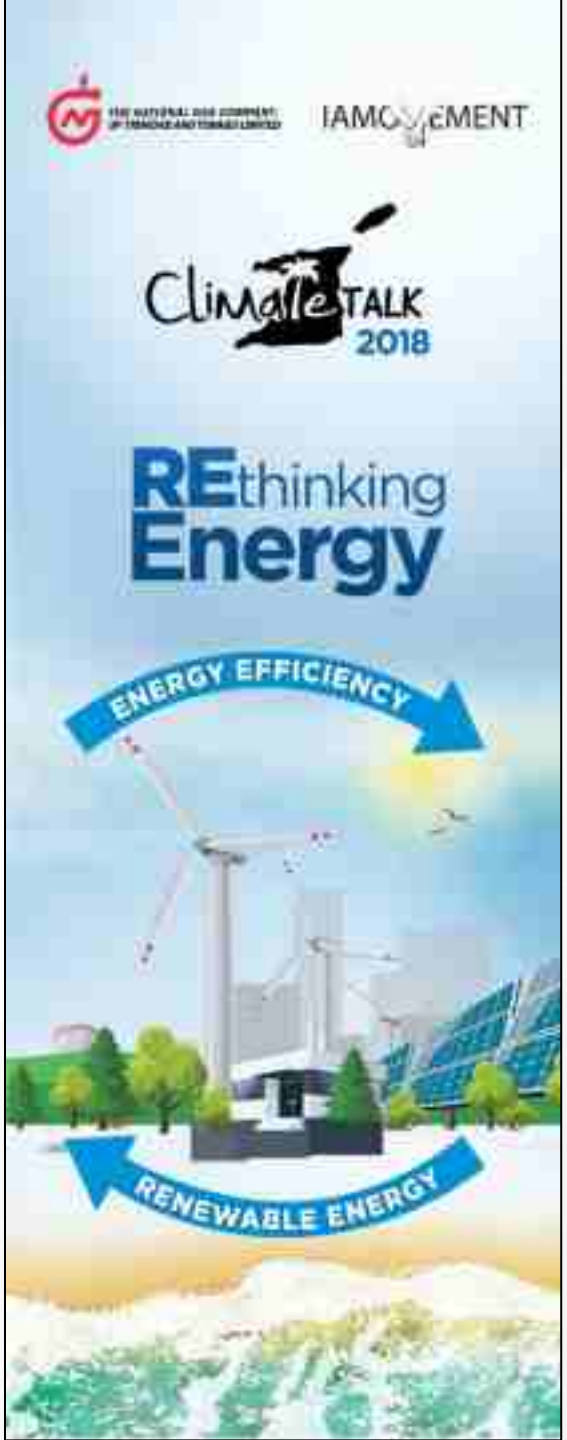
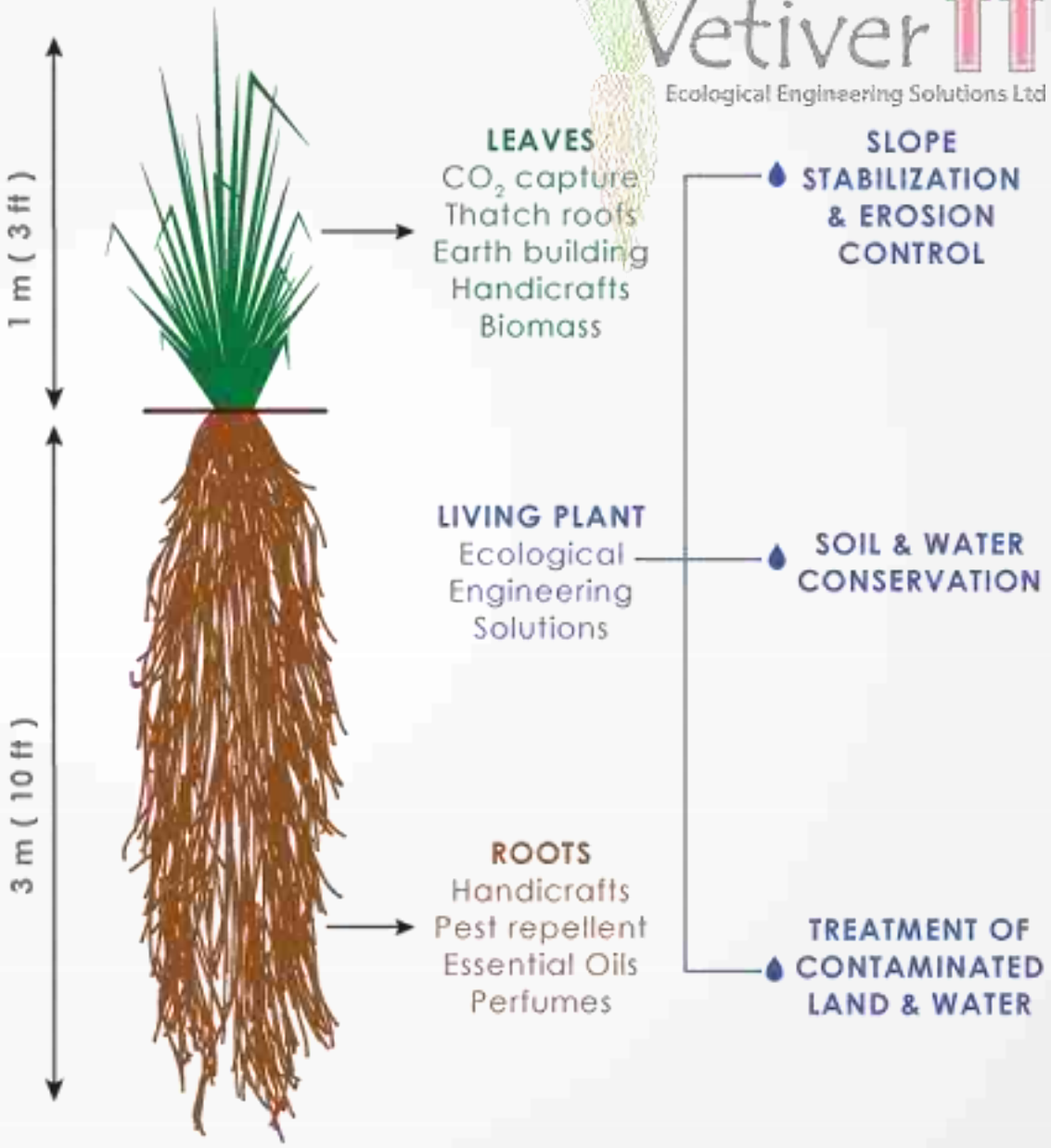
CHANGE
2015
2014
Canada


ClimateTALK
2018
REthinking
Energy
ENERGY EFFICIENCY
RENEWABLE ENERGY

What is **Vetiver Grass** and the **Vetiver System (VS)?**



Growing Impact of REthinking

video series

ILU booklets

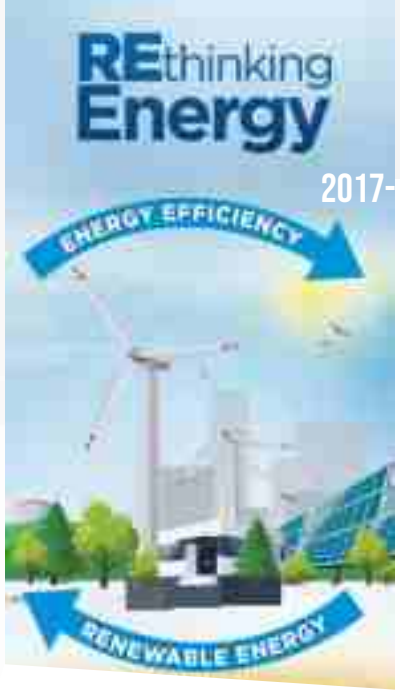
Energy efficiency, Cost-savings, Socio-Economic Impacts: Speaking the same language as key change agents

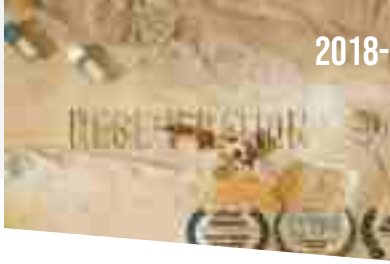
YEARS

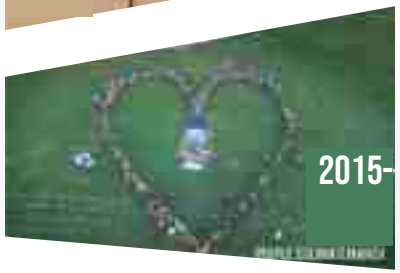
of Climate Mitigation & Climate Adaptation

Projects, Tools, Skillsets

& Networks







Partnerships

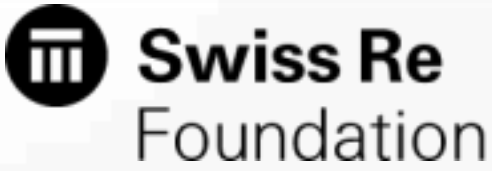
What is the Vetiver Education & Empowerment Project (VEEP)?

"VEEP is a tried and tested model or approach to introduce the Vetiver System (VS) to communities where it can benefit"

The Vetiver Education & Empowerment Project (VEEP) Model

- *Identification of key project implementing partner(s)/ individual(s)*
- *Selection of project participants*
- *Establishment of vetiver nurseries*
- *Carrying out of technical project training modules (classroom and field)*
- *Project site selections and carrying out of for Vetiver System (VS-EbA) interventions*
- *Carrying out vetiver handicraft making and developing training*
- *Co-creation of educational material with the local project leads/NGO (e.g. project brochure)*
- *Production of short educational videos and/or high-quality documentary film*
- *Green business development and livelihood opportunities*

Recognition of VEEP



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EDUCATE INSPIRE EMPOWER

BOV

Building on Vetiver!

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ME-WE-GREEN PROGRAMME COMMUNITIES

1. Lopinot
2. Cedros/Icacos
3. Moruga and Environs
4. East Port of Spain
5. Santa Cruz
6. Paramin, Cameron & Diego Martin
7. Brasso Seco & Environs
8. Forres Park and Environs

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mewegreen@gmail.com | 707-0002 | @IAMOVEMENT

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Be part of the solution
Join the
ME-WE-GREEN Programme!

- Are you located in **Lopinot?**
- Do you face challenges of soil movement, erosion or land slippage affecting your property, agricultural land, or infrastructure?
- Are you interested in learning how to make vetiver handicrafts?

If so, send us an email or whatsapp, and visit our Facebook + IG pages

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IAMOVEMENT ME-WE-GREEN

Be part of the solution
Join the
ME-WE-GREEN Programme!

- Are you located in **Cedros/Icacos?**
- Do you face challenges of soil movement, erosion or land slippage affecting your property, agricultural land, or infrastructure?
- Are you interested in learning how to make vetiver handicrafts?

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Be part of the solution
Join the
ME-WE-GREEN Programme!

- Are you located in **Moruga and Environs?**
- Do you face challenges of soil movement, erosion or land slippage affecting your property, agricultural land, or infrastructure?
- Are you interested in learning how to make vetiver handicrafts?

If so, send us an email or whatsapp, and visit our Facebook + IG pages

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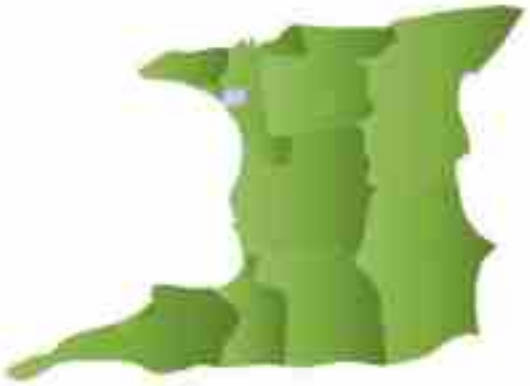
IAMOVEMENT ME-WE-GREEN

Be part of the solution
Join the
ME-WE-GREEN Programme!

- Are you located in **East Port of Spain?**
- Do you face challenges of soil movement, erosion or land slippage affecting your property, agricultural land, or infrastructure?
- Are you interested in learning how to make vetiver handicrafts?



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"Strengthening Coastal and Marine Climate Resilience through Upland and Coastal Eco-System Base Adaptation and Community Engagement"

CARIBBEAN BIODIVERSITY FUND

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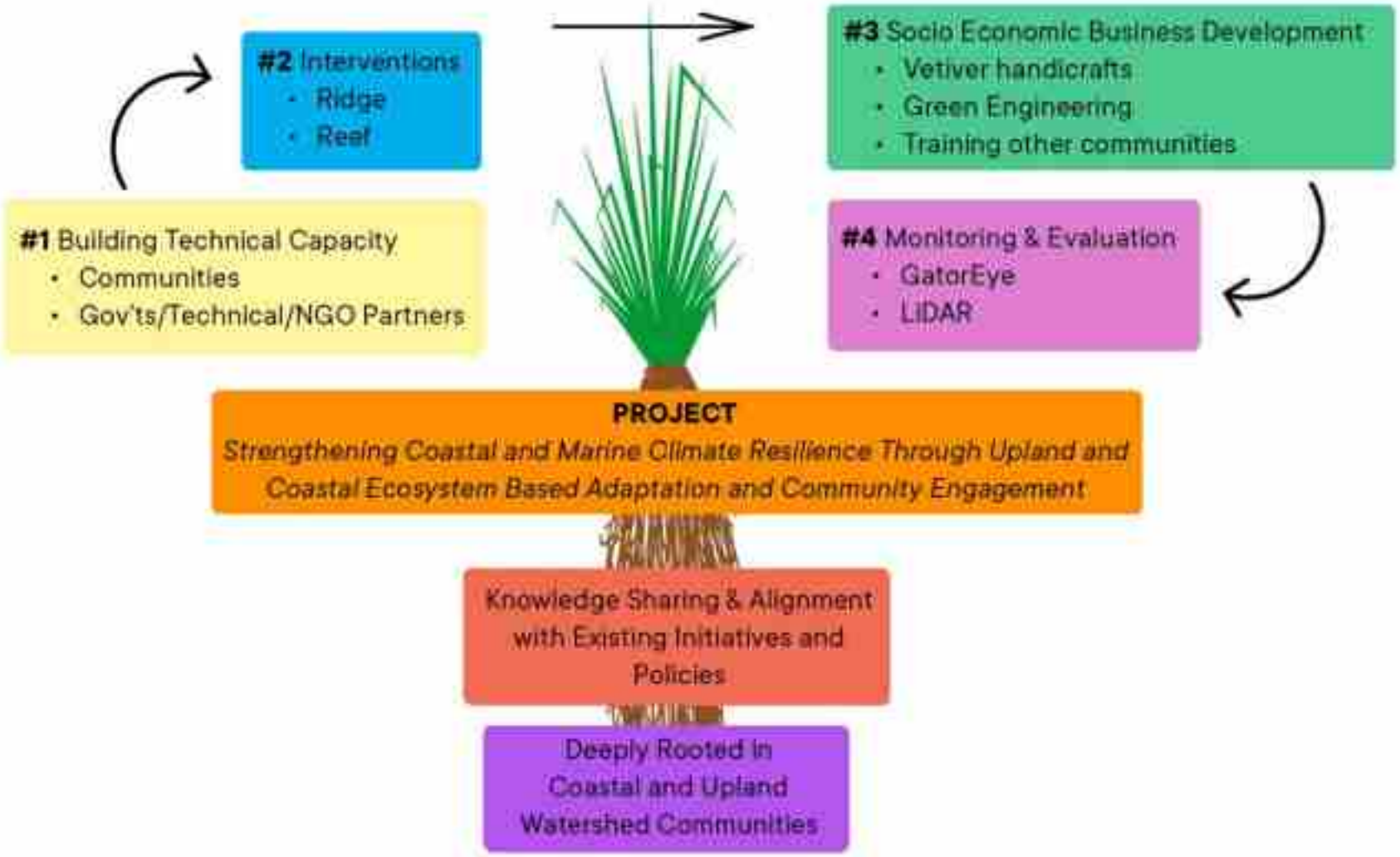
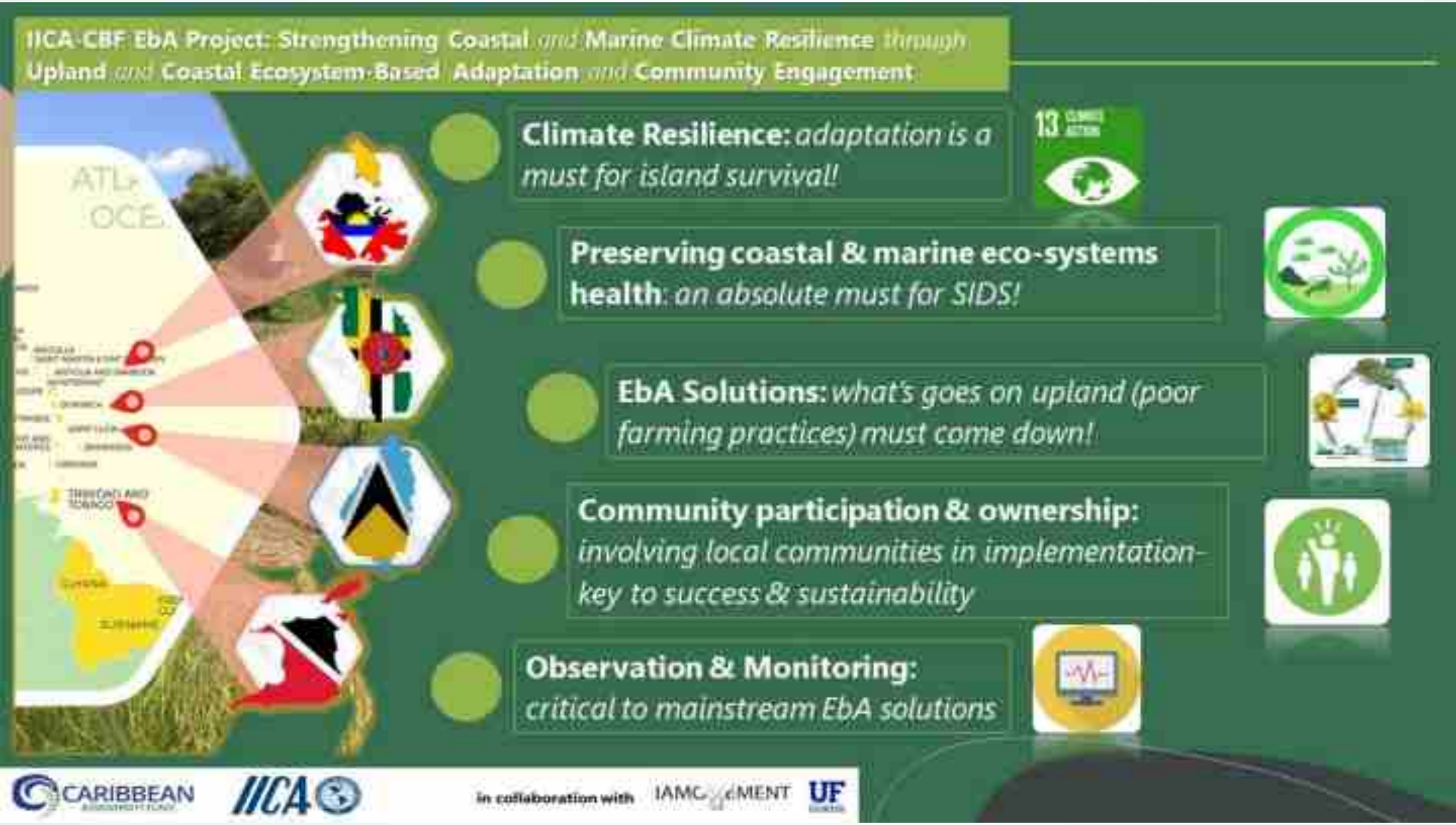
Project Components and Approach



"Strengthening Coastal and Marine Climate Resilience through Upland and Coastal Eco-System Base Adaptation and Community Engagement"



"Strengthening Coastal and Marine Climate Resilience through Upland and Coastal Eco-System Base Adaptation and Community Engagement"

Ecosystem Based Adaptation (EbA)

"VEEP/VS-EbA solutions"

Anse La Raye Quarry – Saint Lucia

Canaries River-mouth – Saint Lucia

Petite Soufriere

Inland Roads - Dominica

Kalinago Territory – Dominica

Kalinago Territory - Dominica

Dominica:
Landslides and floods triggered by Hurricane Maria (18 September, 2017)

Hurricane Maria 'triggered 9,960 landslides in Dominica'

Cooke Landfill - Antigua

Cooke Landfill - Antigua

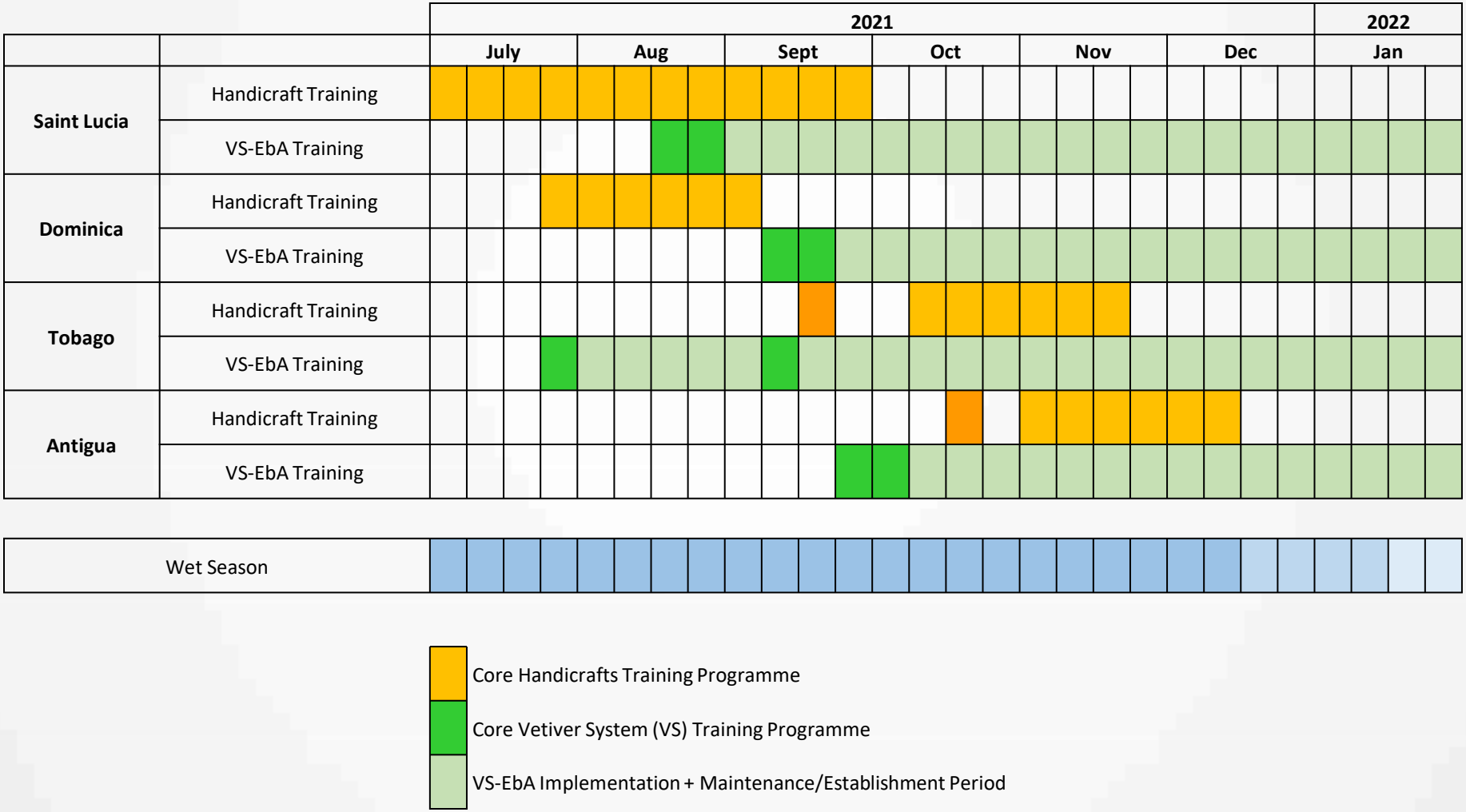
L’Anse Fourmi - Tobago

Charlotteville - Tobago

Delaford RC School - Tobago

Speyside High School Wetland - Tobago

VEEP/VS Training Programmes



TRAINING AGENDA

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IAMovement VEEP/VS-EbA Training Programme Agenda - Saint Lucia			
Listing of Programme Training Topics			
Week 1 (17th - 20th August)			
DAY	**Sessions Plan and Topics**	**Session Times/Length**	**Training Dates**
1	*Morning:* Arrivals, Project Training Opening and Intro to vetiver grass and Vetiver System (VS)	9:30 am - 12 pm (2.5-hrs)	17-Aug
	Afternoon: Field visits to see nurseries, quantify stock, learn and understand plant propagation, and commence plant preparation activities	1 pm - 4 pm (3-hrs)	
2	*Morning:* Learning technical methods for VS design and installation; individual sites design and discussions; making an A-frame	9 am - 12 pm (3-hrs)	18-Aug
	Afternoon: Site visits to various sites in Canaries to jointly assess and design; continuation of plant preparation activities; creation of plants storage sand-bed	1 pm - 4 pm (3-hrs)	
3	*Morning:* Green business training session, discussion of opportunities; field planning concepts + checklist, and preliminary planning of Week-2 activities	9 am - 12 pm (3-hrs)	19-Aug
	Afternoon: Site assessment and design planning visit to Anse La Raye quarry with full participants group, and other relevant sites along the way	1 pm - 4 pm (3-hrs)	
4	*Morning:* Joint planning to finalize field plan for week-2 with field team rostant/schedule; Field training at target site(s) in Canaries; including designing with A-frame, plotting for VS installation	9 am - 12 pm (3-hrs)	20-Aug
	Afternoon: Completion of VS installation after completing design during morning period, at target site(s) in Canaries	1 pm - 4 pm (3-hrs)	

TRAINING AGENDA

IAMOVEMENT IICA CARIBBEAN BIODIVERSITY FUND

IAMovement VEEP/VS-EbA Training Programme Agenda - Saint Lucia			
Listing of Programme Training Topics			
Week 2 (23rd - 27th August)			
DAY	**Sessions Plan and Topics**	**Session Times/Length**	**Training Dates**
5	VS Design and Installation Activities by CCIF Field Team (Foreman, Logistical Support, Participants sub-group) at target site(s) in Canaries; and visit by IAM-IICA-CCIF technical members to Choc Bay potential sites	9 am - 4 pm	23-Aug
6	VS Design and Installation Activities by CCIF Field Team (Foreman, Logistical Support, Participants sub-group) at Anse La Raye Quarry	9 am - 4 pm	25-Aug
7	VS Design and Installation Activities by CCIF Field Team (Foreman, Logistical Support, Participants sub-group) at Anse La Raye Quarry + any other relevant sites in Anse La Raye and/or Canaries, Anse La Verdue, etc	9 am - 4 pm	26-Aug
8	VS Design and Installation Activities by CCIF Field Team (Foreman, Logistical Support, Participants sub-group) at Choc Bay select target site(s); assessment at any other relevant sites; VS Specialist joint planning with CCIF of 2021 Field VS Installation and Maintenance Activity Agenda moving forward	9 am - 4 pm	27-Aug

Videos + Short Documentary film

Filmmaker: Lawrence Dupuis

Vetiver grass nurseries: plant preparation

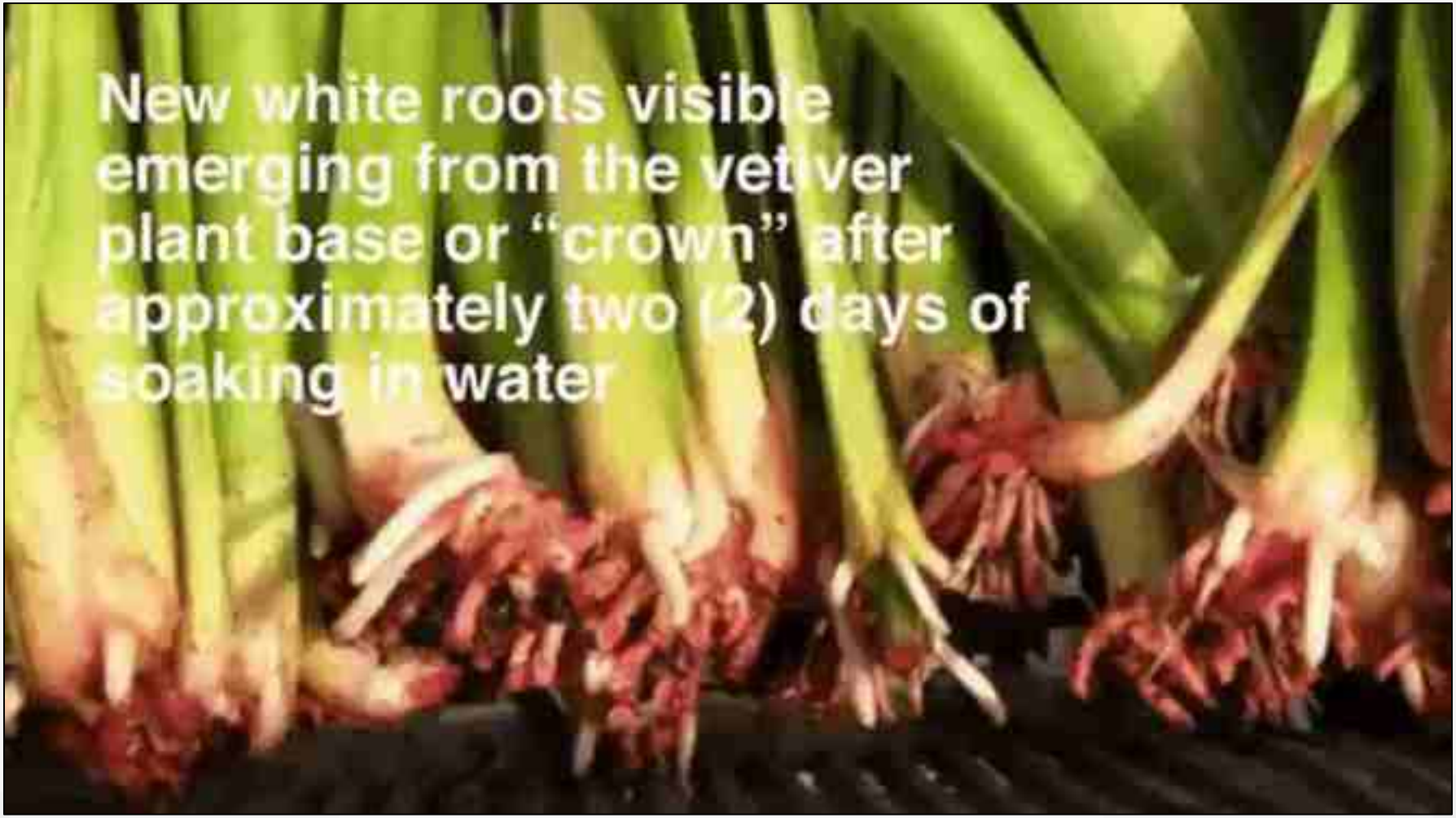

Vetiver slip
leaves
10 cm Length
Vetiver slip
roots
5 cm Length


1

New vetiver plant (slips) cut with cutlass on piece of wood (10 cm or 4 inches length, 1 inch roots), and placed to soak in container for 2-3 days to stimulate new root growth

New vetiver plant (slips) bundles of 20 plants each, soaking in water basins for 2 days to stimulate new root growth

New white roots emerging after 2 days soaking in water



Short video

Thank you!

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VEEP + the Vetiver System (VS)
Case Studies + Best Practices

Canaries, Saint Lucia

19th August 2021

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Contents

- *VEEP Recap + Programme Goals*
- *The Vetiver System (VS) overview + best practices*
- *Vetiver System (VS) case studies - in the Caribbean and around the world*
- *Making and using an A-Frame*

Vetiver Education & Empowerment Project (VEEP)

Vetiver Education & Empowerment Project (VEEP)

HOUSE OF VETIVER


Turtle Warrior

Vetiver Education & Empowerment Project (VEEP)

VEEP VS TRAINING PROGRAMME GOALS

To ensure that:

1. Participants have an in-depth understanding about vetiver grass and the Vetiver System (VS), and wider community awareness about the benefits of vetiver also grows
2. Participants gain hands on training experience and capacity with vetiver plant preparation, propagation and installation according to Vetiver System (VS) best practices
3. VS interventions commenced or completed at first set of identified project sites in Saint Lucia
4. CCIF VS EbA field team trained and outfitted to move forward with installation and maintenance programme during the remainder of 2021
5. Greater understanding by all on green business opportunities and foundations laid for VS green business development

Needs in Saint Lucia?

What is the Vetiver System (VS)?

*"**A cost**-effective green infrastructure solution to tackle a wide range of soil and water related **challenges**"*

Watch short introductory video here to learn about vetiver and the Vetiver System (VS):

https://vimeo.com/283084349/893e726b2a

The Vetiver System (VS) refers to the correct implementation of vetiver grass through a systematic approach to achieve these benefits

This entails the most effective and successful methods for:

- *Project planning and design depending on needs*
- *Land preparation*
- *Contour plotting and correct installation*
- *Inter-cropping*
- *Maintenance during establishment and long term upkeep of the hedgerows*
- *Integration of other vetiver uses for further socio-economic benefits and to support VS application sustainability*

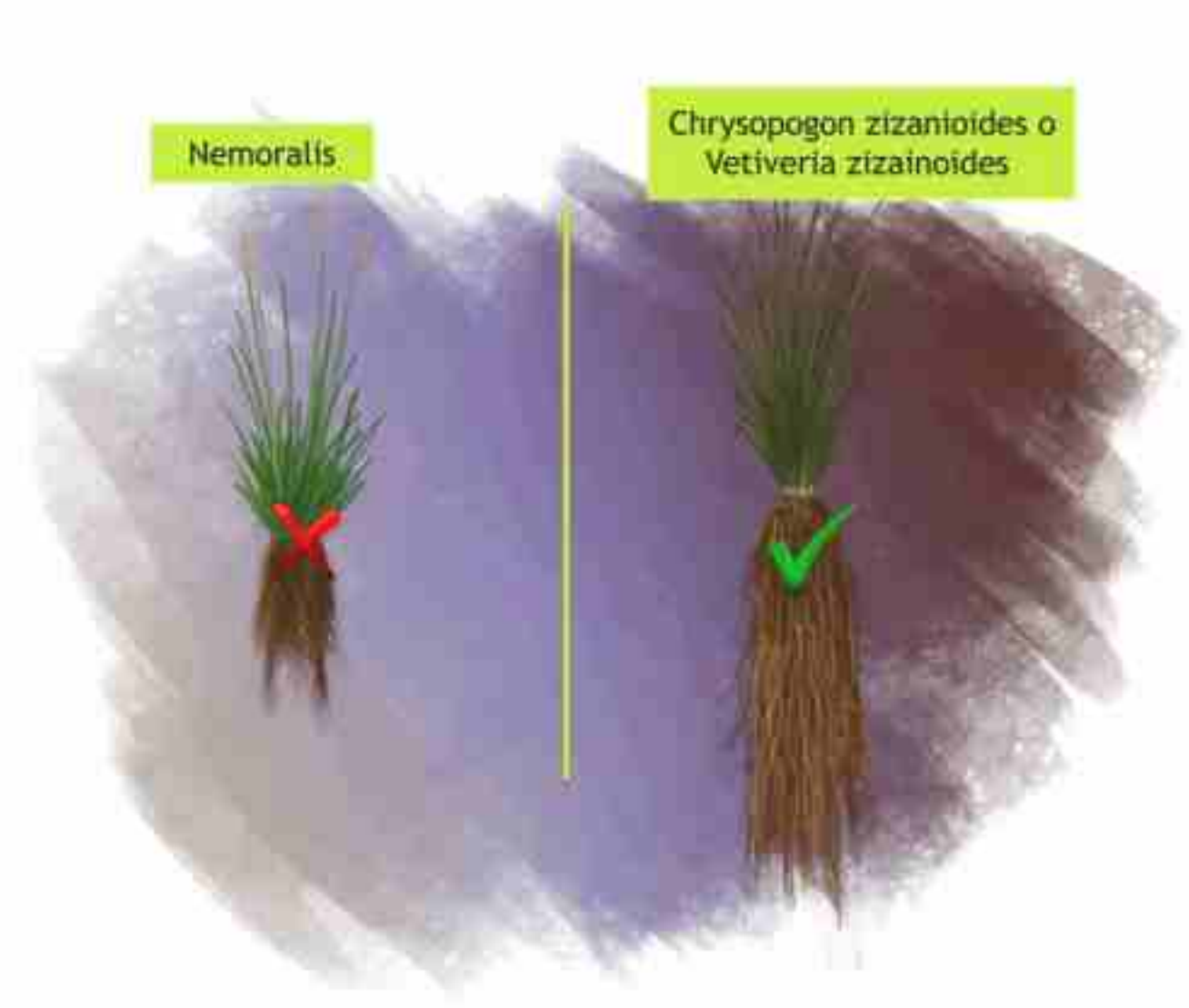
The Vetiver System (VS): Facts + Benefits

- ✓ *Vetiver roots can grow up to 10-ft deep in first 2 years*
- ✓ *Deep and fibrous root system make for powerful soil stabilization tool, proven to increase shear strength by up to 40%*
- ✓ *As a commercial solution, VS can replace alternative hard-engineered infrastructure (walls, rock baskets) in certain cases and presents approx. cost ($) savings of 80%*
- ✓ *Vetiver grass certified non-invasive by USDA (must be propagated and installed manually and maintained during establishment)*
- ✓ *Powerful phytoremediator for treatment of contaminated water/soil (heavy metals, nutrients, etc.)*
- ✓ *Requires propagation and planting by hand (cannot be spread by seed); and therefore requires strong manual-human inputs, and through this creates livelihood opportunities*

CORRECT SPECIES – *Chrysopogon zizanioides*

Certified Non-Invasive by the USDA

(produces no viable seed and has no running stolons)



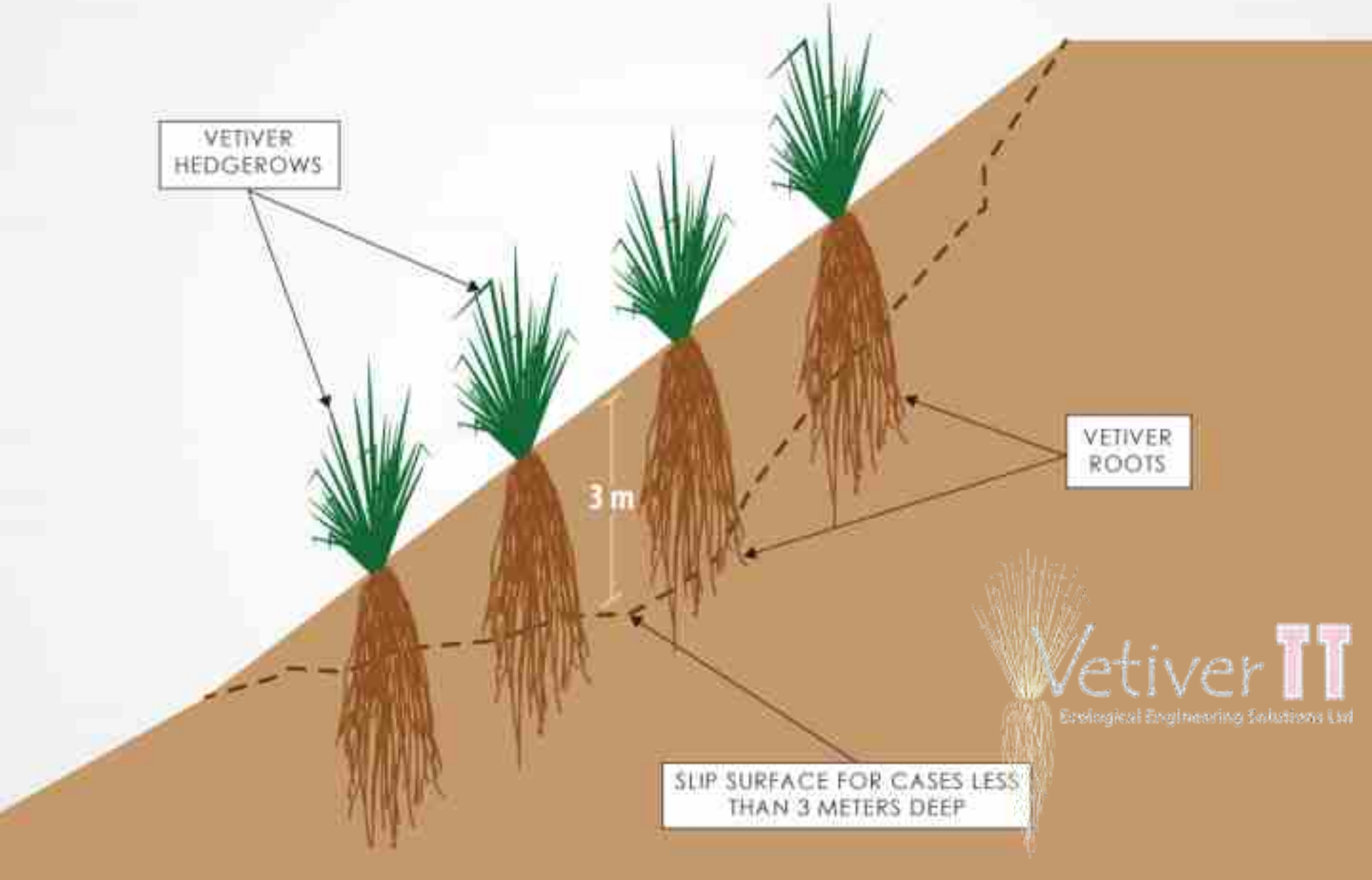
CORRECT SPECIES - *Chrysopogon zizanioides*
Certified Non-Invasive by the USDA
(produces no viable seed and has no running stolons)

X Chrysopogon nemoralis

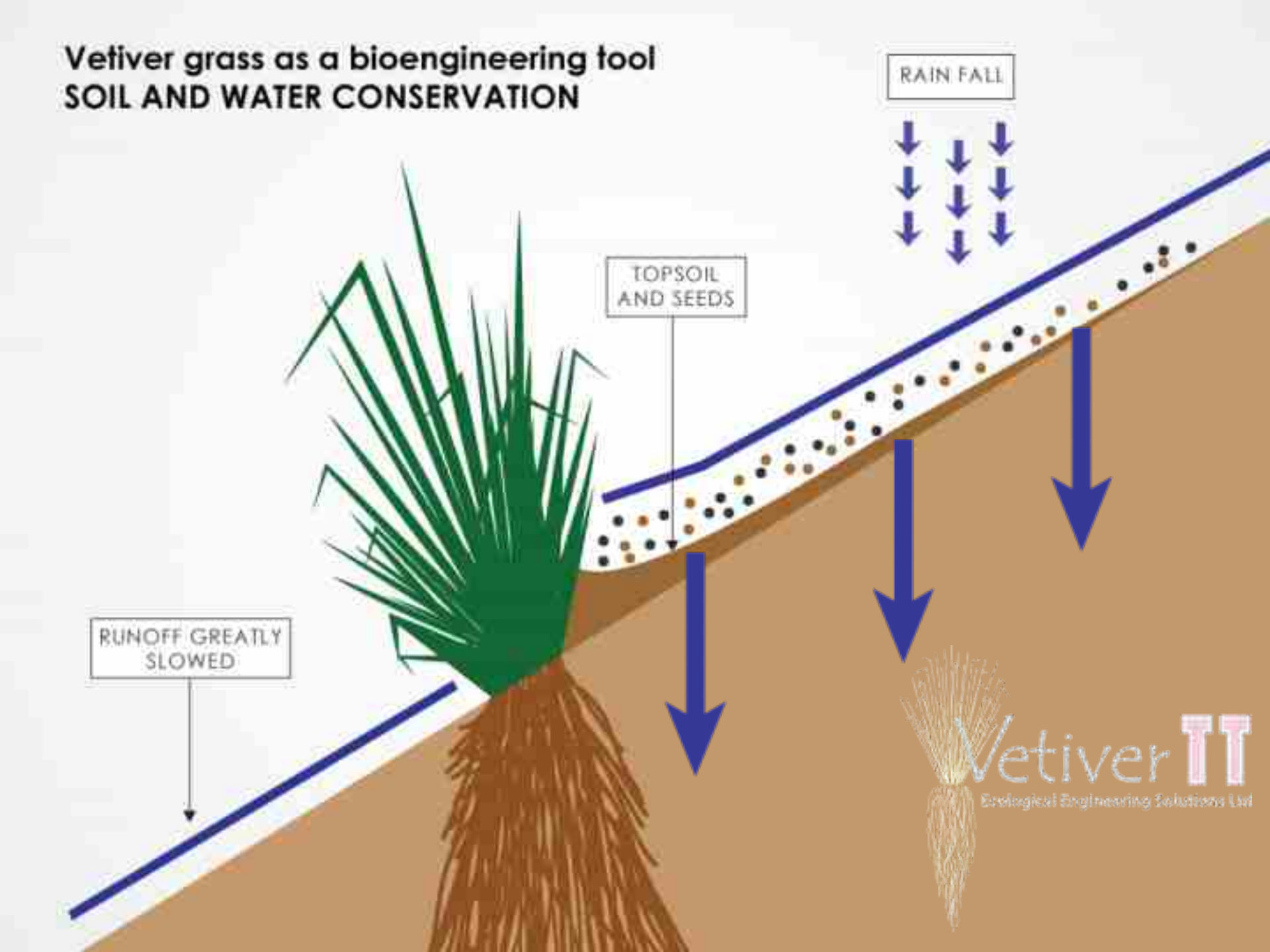
✓ Chrysopogon zizanioides

How does the Vetiver System (VS) work as a soil/water bioengineering tool?

Vetiver grass as a bioengineering tool
SLOPE STABILIZATION



Vetiver grass as a bioengineering tool
SOIL AND WATER CONSERVATION



Topsoil retention behind vetiver hedgerow

Natural terracing occurs

Erosion & Sediment Control

Brian Lara Stadium

(incorrect vetiver installation)

Phytoremediation

(treatment of contaminated lands and water)

Can absorb very large amounts of nutrients N, P and organic contaminants and thrive in very toxic conditions, absorbing heavy metals

Heavy Metals
Arsenic (As)
Cadmium (Cd)
Copper (Cu)
Chromium (Cr)
Lead (Pb)
Mercury (Hg)
Nickel (Ni)
Selenium (Se)
Zinc (Zn)

- ✓ Coliforms
- ✓ Phosphorus
- ✓ Nitrogen

Vetiver System (VS) phytoremediation in constructed wetlands

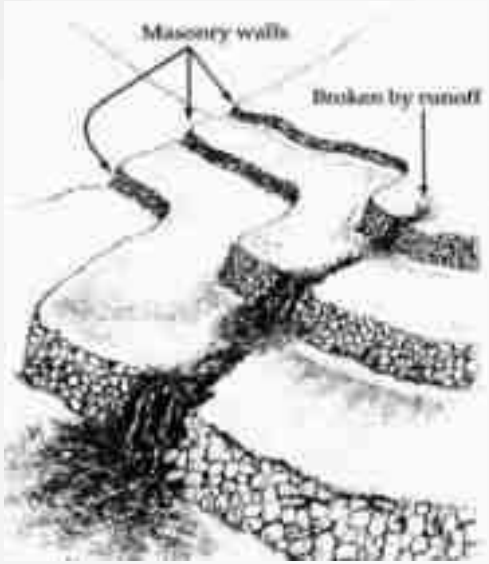

Sapote
Clays

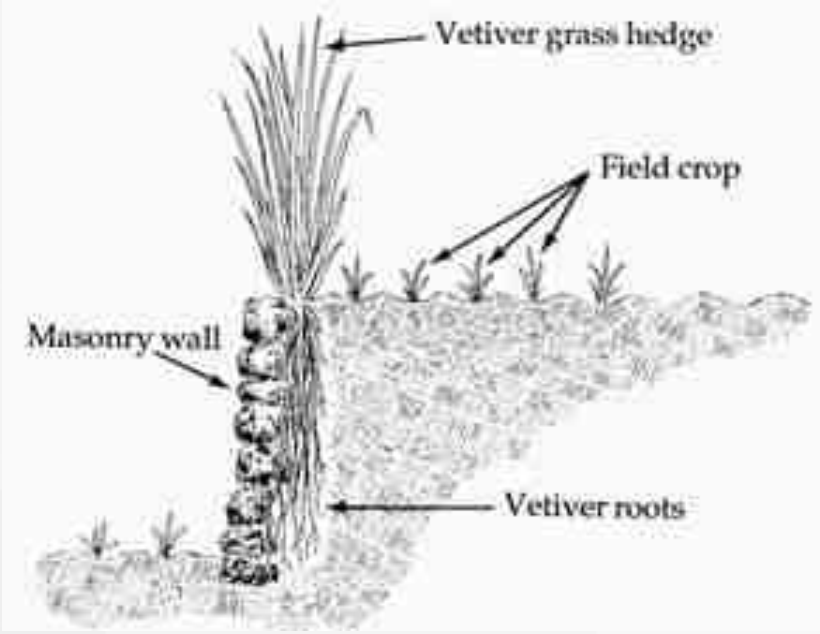
Road and Infrastructure Protection

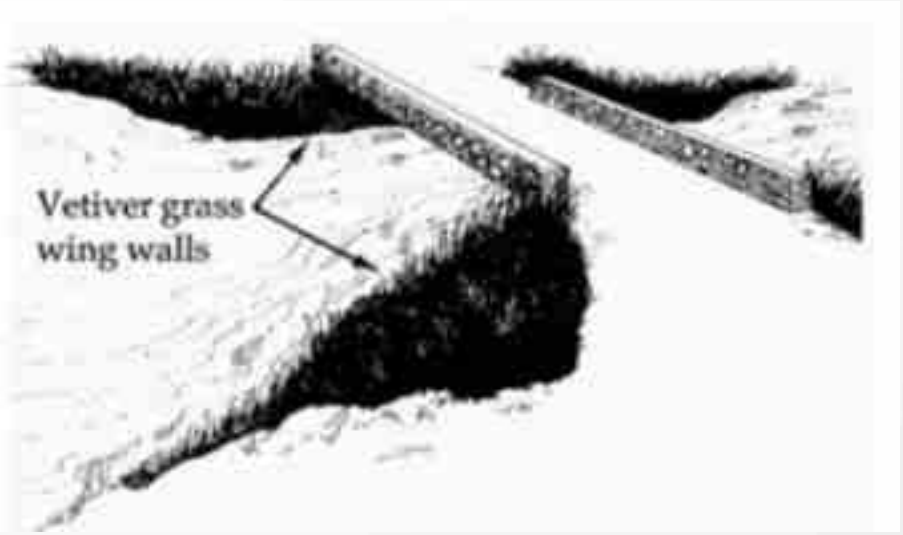
El Salvador - concrete/vetiver interface

Australia, Queensland - Vetiver used to stabilize this fill slope

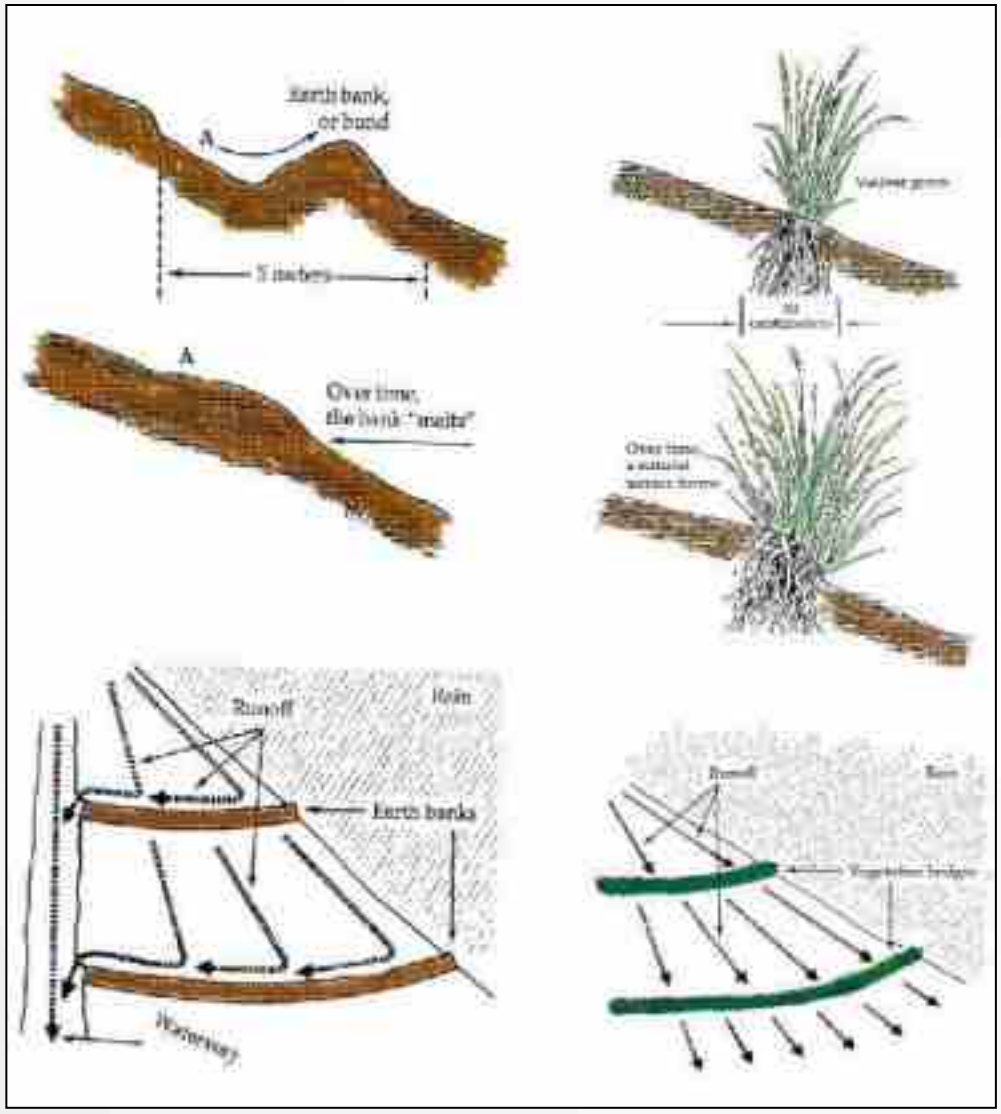
Infrastructure protection





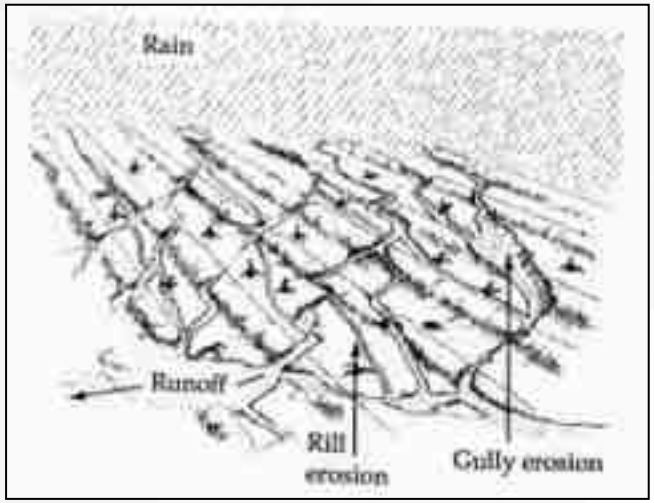


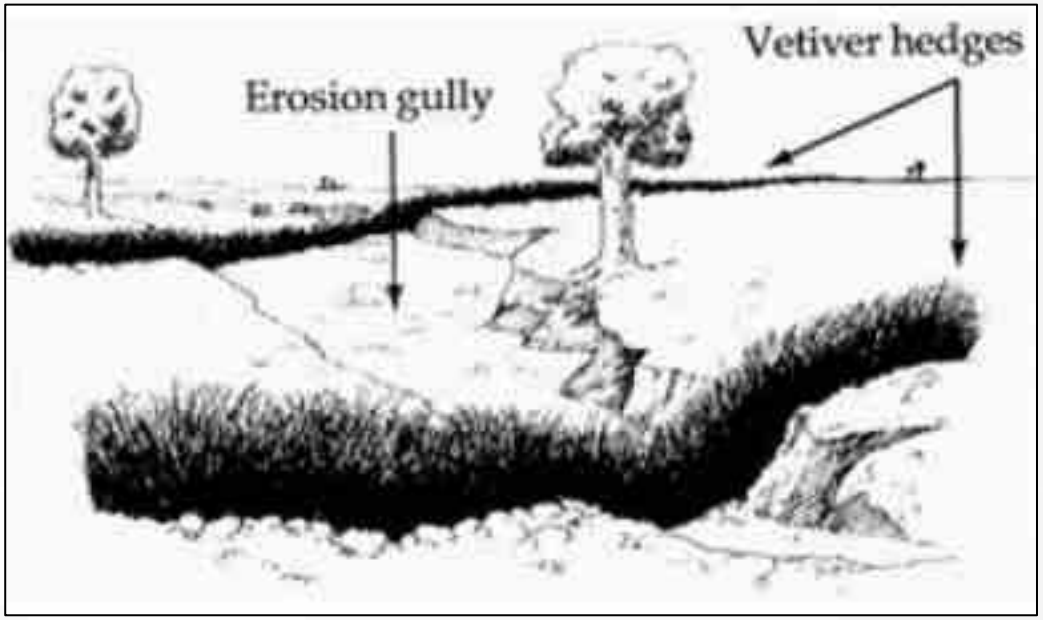
Climate Smart Agro-Ecology

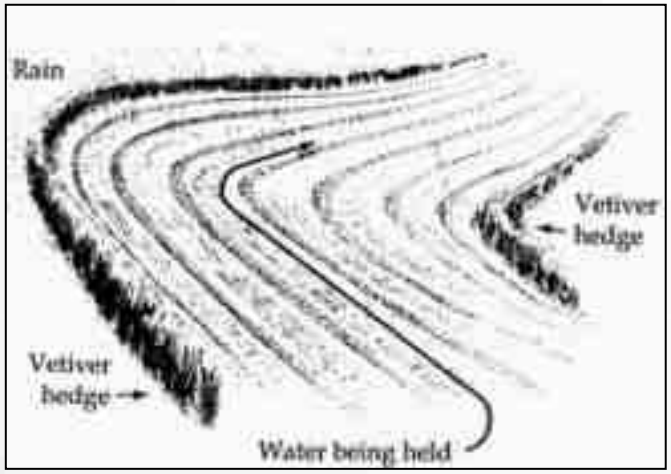


Soil & Water Conservation

REPAIRING EROSION GULLIES AND PREVENTING FUTURE ONES



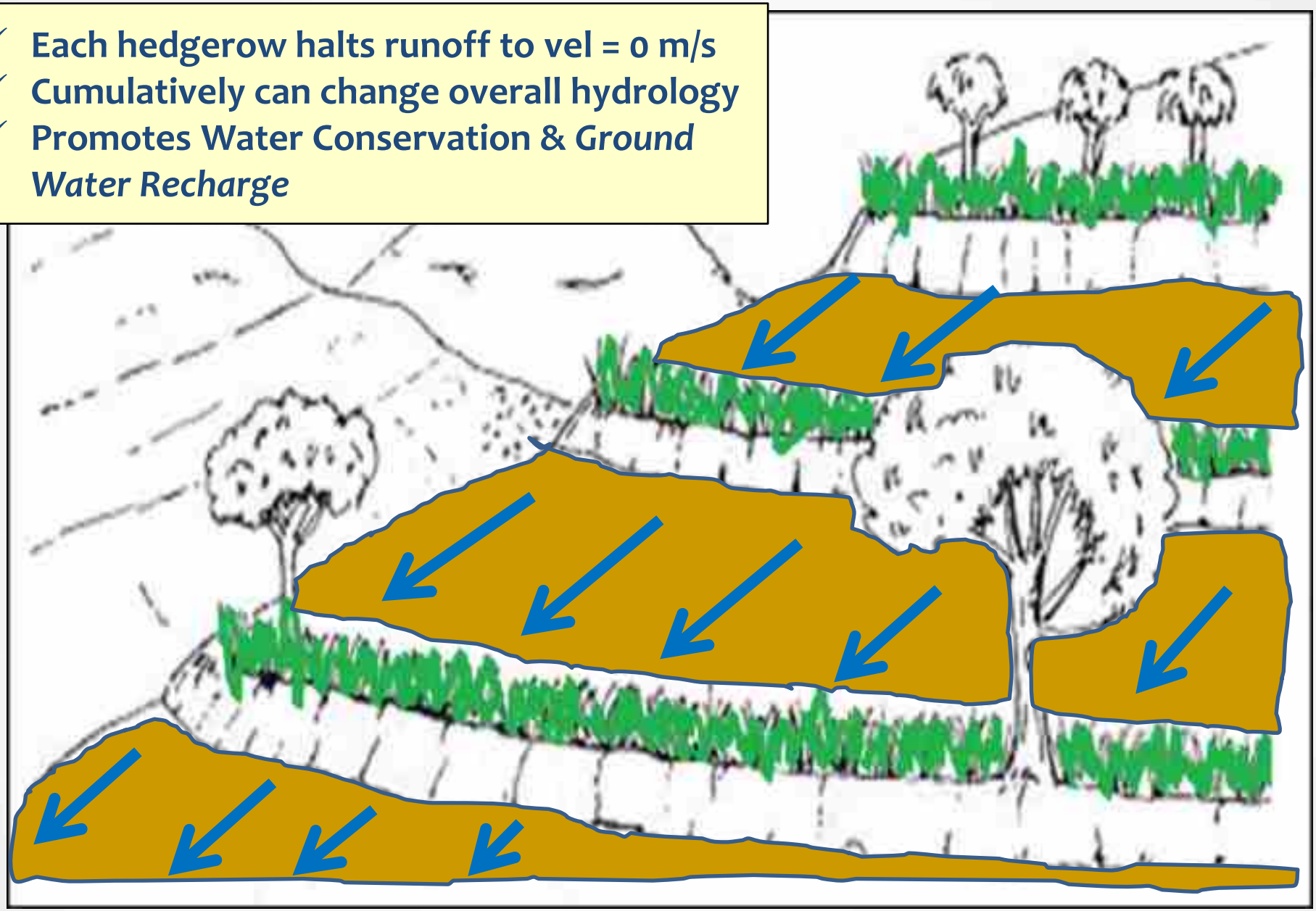




DISTRIBUTING WATER EVENLY ON THE LAND

Soil & Water Conservation

- ✓ Each hedgerow halts runoff to vel = 0 m/s
- ✓ Cumulatively can change overall hydrology
- ✓ Promotes Water Conservation & *Ground Water Recharge*



Paramin
(Trinidad)


“Ridge to Reef” Erosion
& Sediment Control

Vetiver System (VS) Solutions in T&T

Residential Projects

Residential Projects

Residential Projects

Residential Projects

Sapote Clays - South Oropuche (Tucker Energy Campus)

Sapote Clays - South Oropuche (Tucker Energy Campus)

Coastal Protection Works - Quinam (CPU)

Coastal Protection Works - Quinam (CPU)

Coastal Protection Works - Quinam (CPU)

Coastal Protection Works - Quinam (CPU)

Commercial Works (Sapote Clays)

Commercial Works (Sapote Clays)

Commercial Works (Sapote Clays)

Slope stabilization in clay soils in Trinidad

Water Management Facility in Trinidad

Landslide Rehabilitation Arima/Blanchisseuse Road

Landfill Leachate Pond Embankment Stabilization

Landfill Leachate Pond Embankment Stabilization

Contaminating Landfill Leachate

Landscaping

Landscaping

Landscaping

Vetiver System (VS) Solutions Globally

Disposal of Landfill Leachate

Case study in Australia

SEEPAGE CONTROL: Landfill leachate is highly polluted with heavy metals

Vetiver planted on seeping leachate.

Six months after planting, excellent growth, unaffected by heavy metals.

One year after planting, landfill leachate was completely dried up

La Grecia, Costa Rica

Infrastructure Protection

El Salvador - concrete/vetiver interface

Vetiver System (VS) as a 'band-aid' for soil-concrete interface along drains, roads, etc; to prevent washout and eventual infrastructure collapse

Road + Bridge Embankments

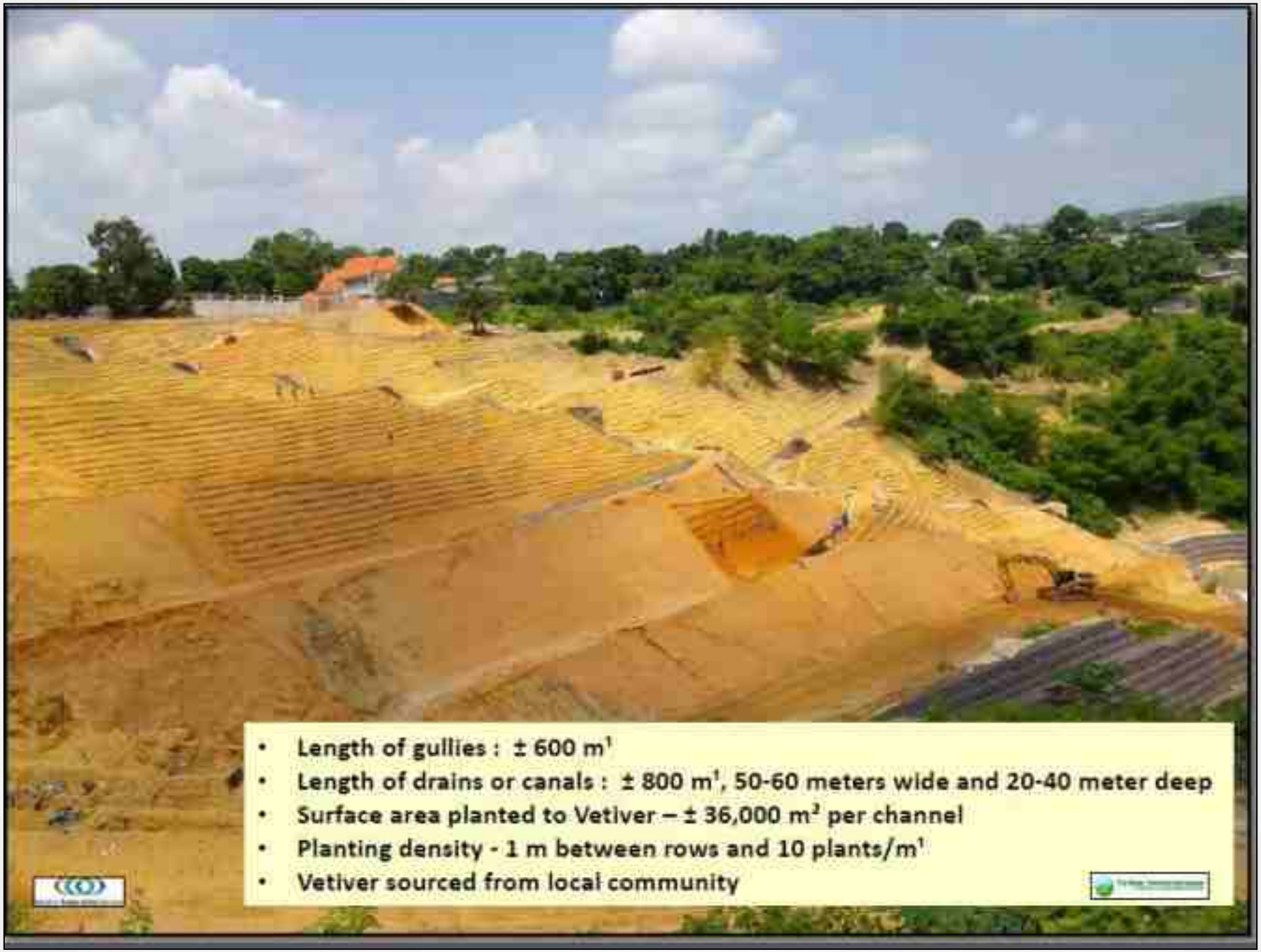
Three weeks and three months after vetiver planting at Doria bridge approach

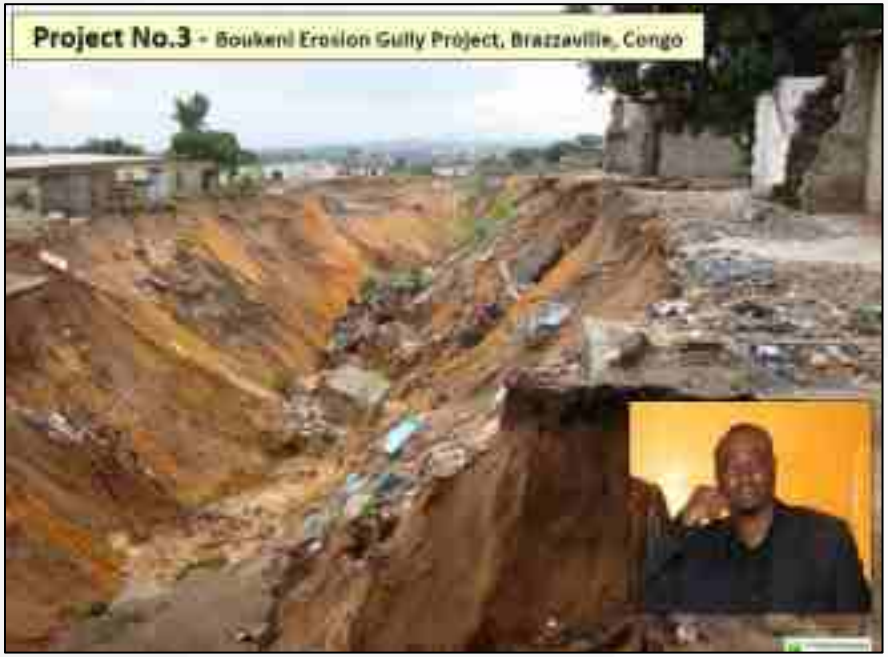
At Installation

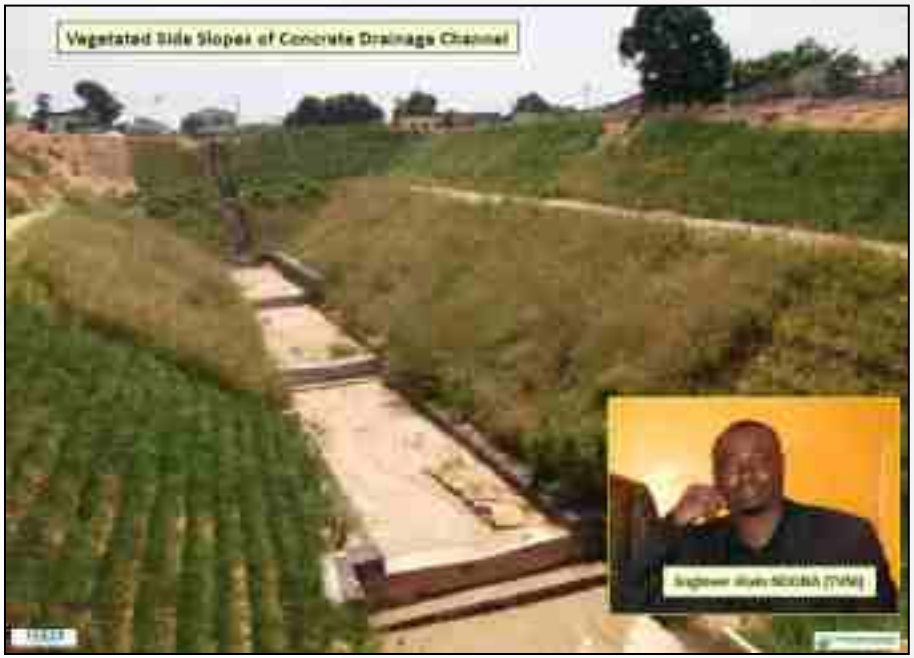
2 months later

18 months later

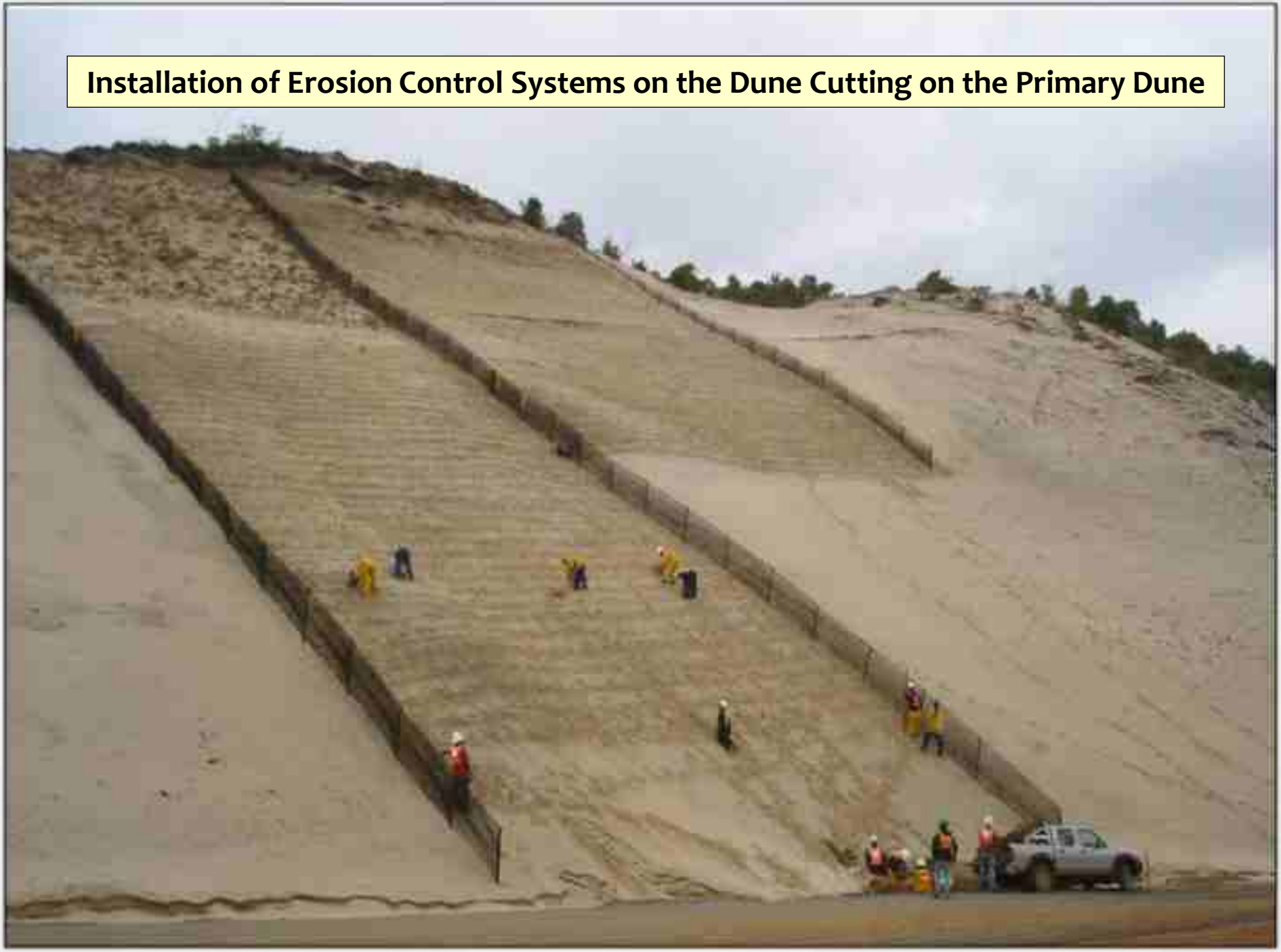

Side Slope Rehabilitation in progress
45° slope angle with benching at 10 m intervals on average.

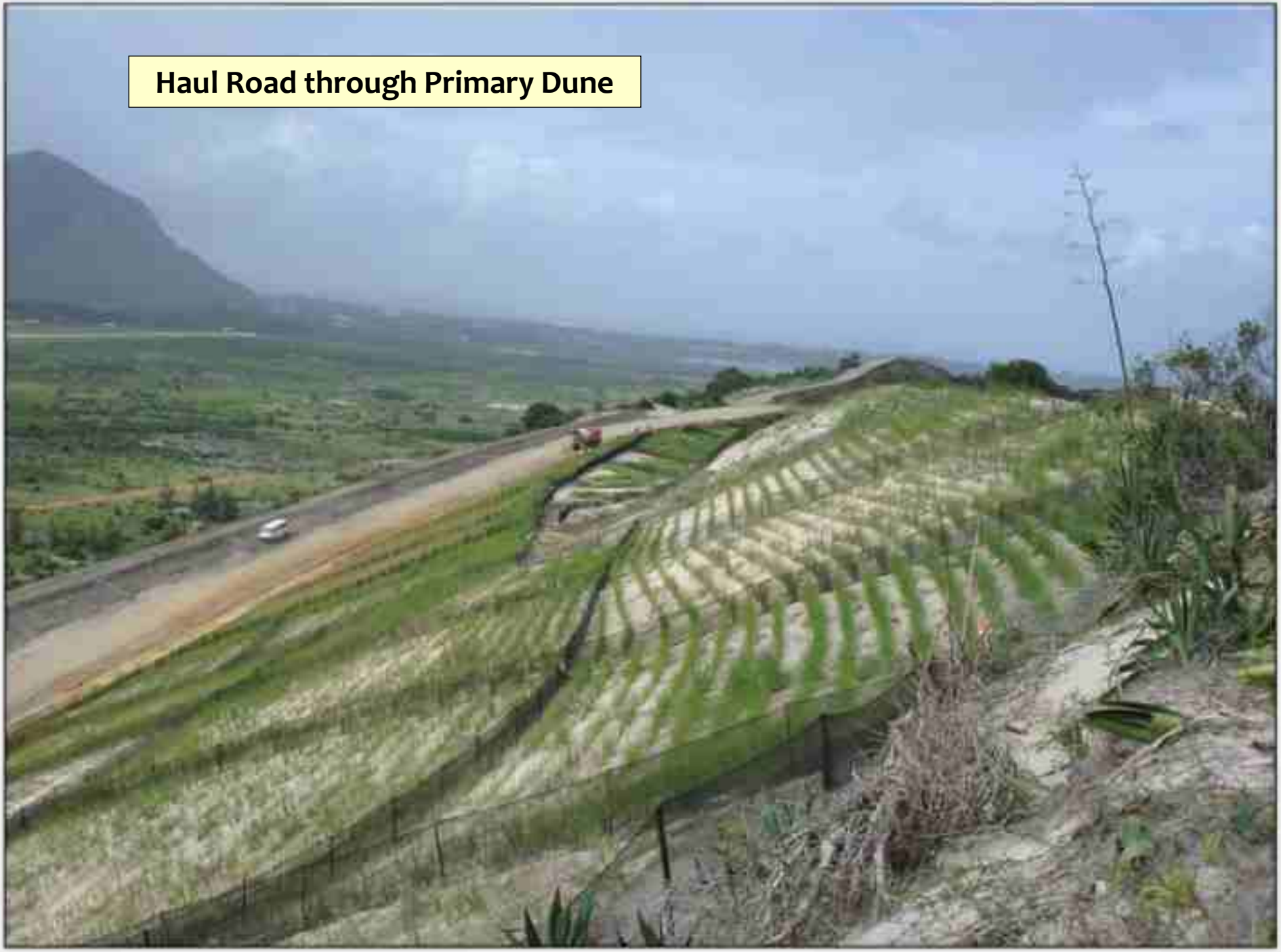

• Length of gullies : ± 600 m¹
• Length of drains or canals : ± 800 m¹, 50-60 meters wide and 20-40 meter deep
• Surface area planted to Vetiver – ± 36,000 m² per channel
• Planting density - 1 m between rows and 10 plants/m¹
• Vetiver sourced from local community

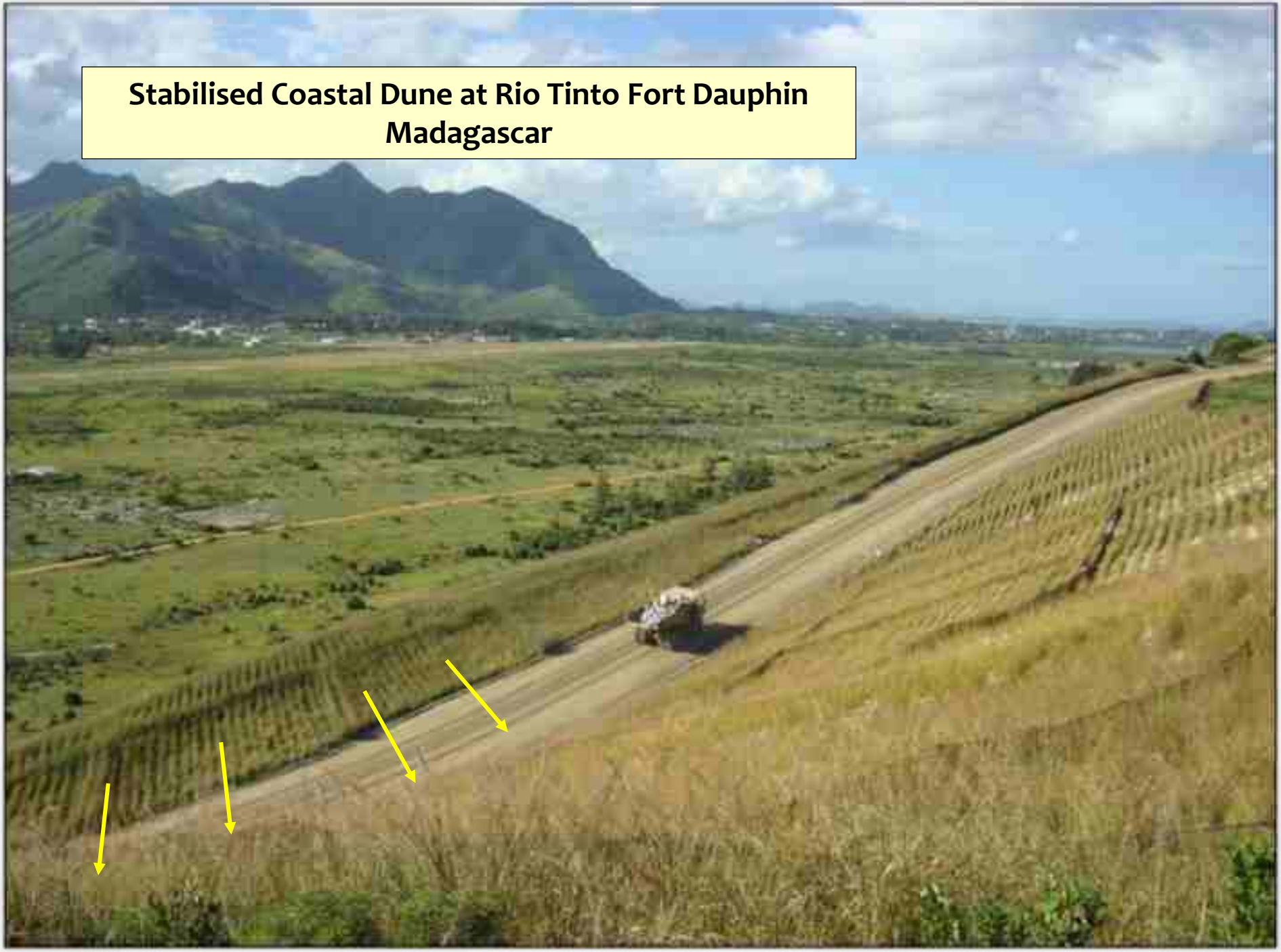

Project No.3 - Boukeni Erosion Gully Project, Brazzaville, Congo


Vegetated Side Slopes of Concrete Drainage Channel

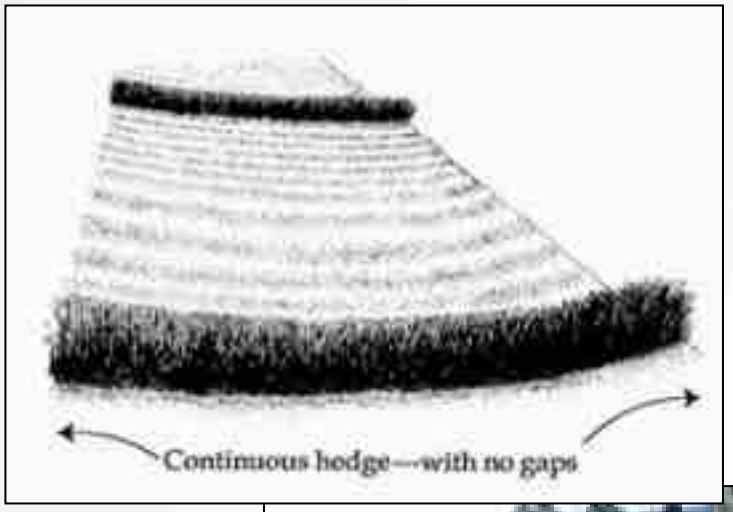
Installation of Erosion Control Systems on the Dune Cutting on the Primary Dune



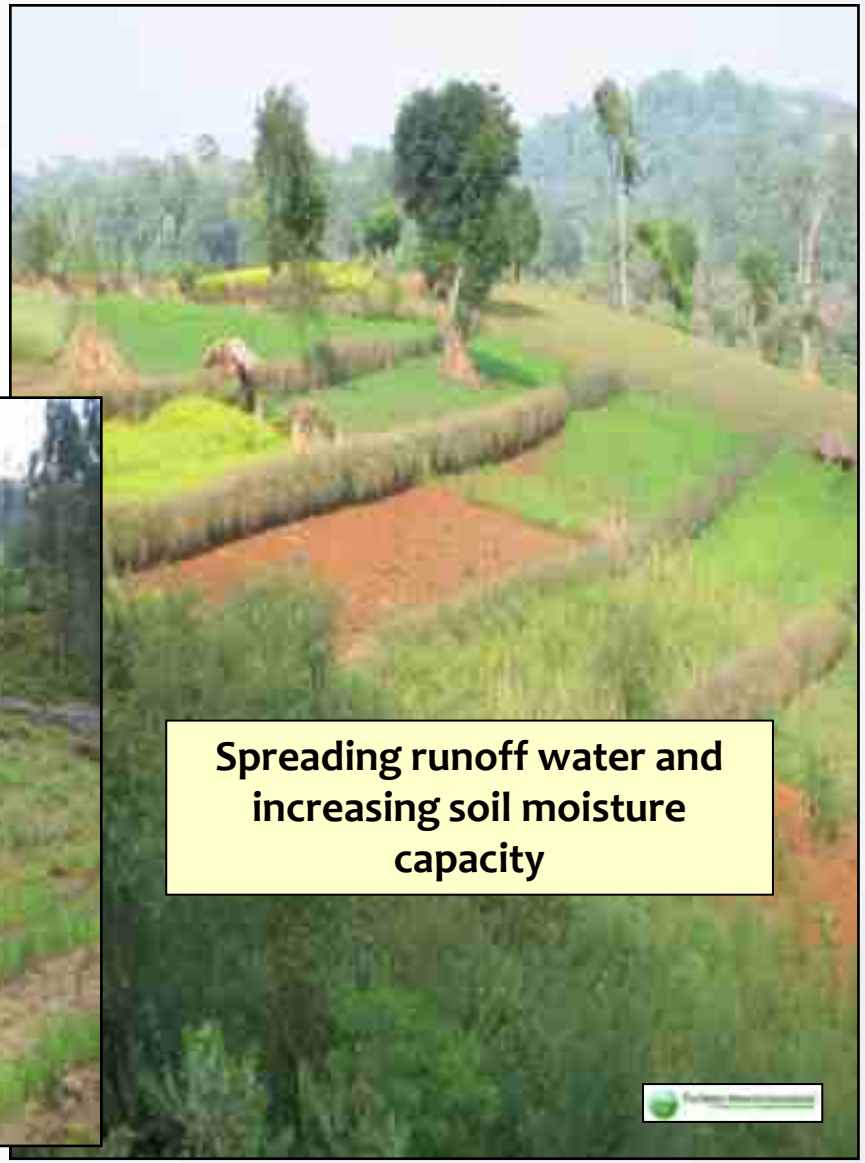

Haul Road through Primary Dune

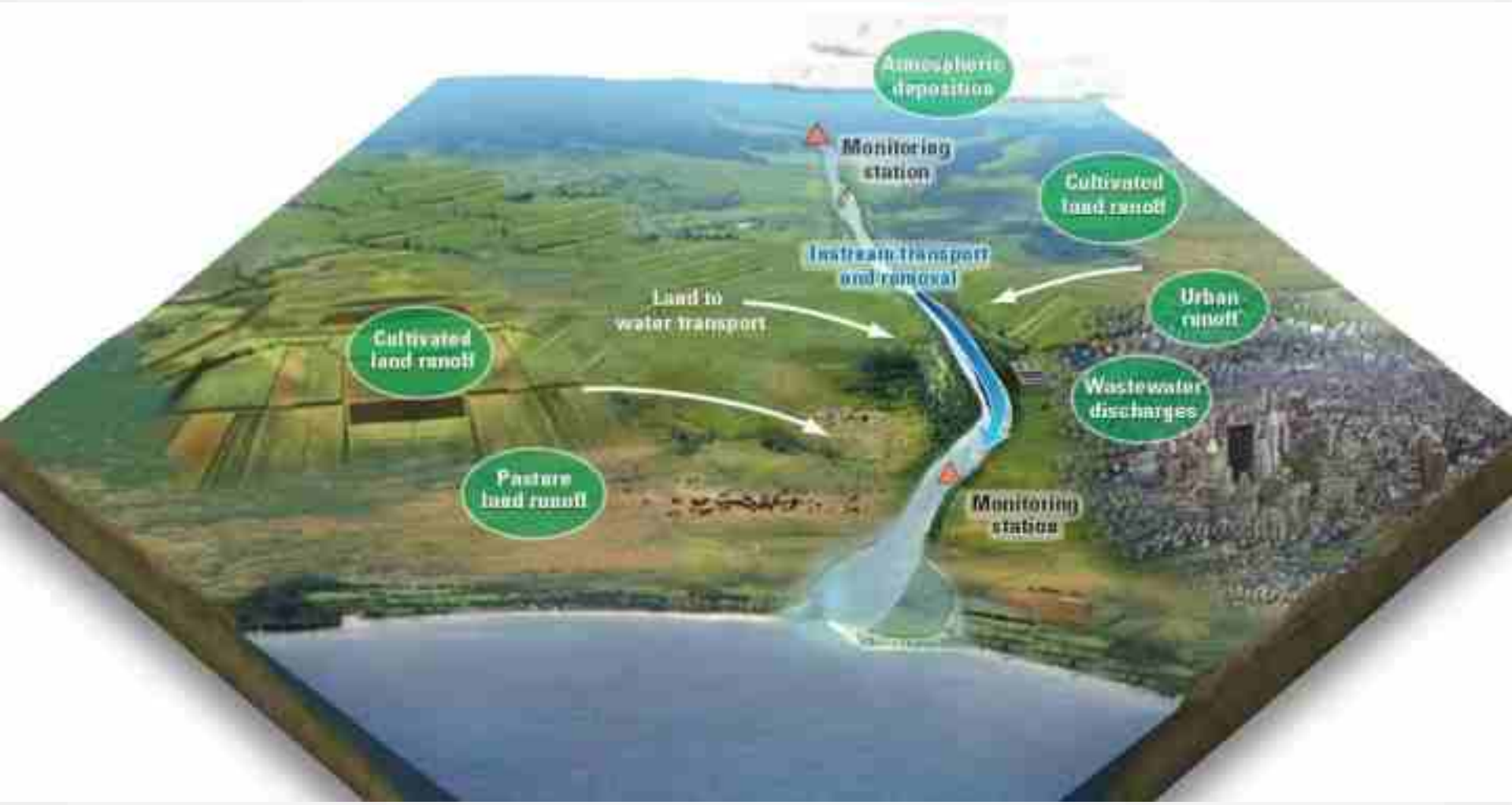

Stabilised Coastal Dune at Rio Tinto Fort Dauphin
Madagascar

Climate Smart Agro-Ecology



Ethiopia - Rehabilitation of Degraded Land
Vetiver hedges on contour contributed to ground water "re-charge" increasing soil moisture capacity

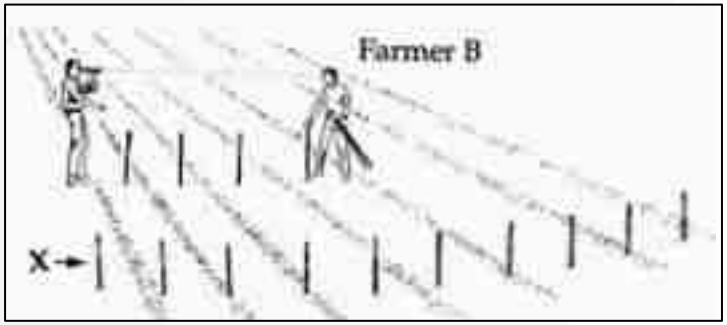


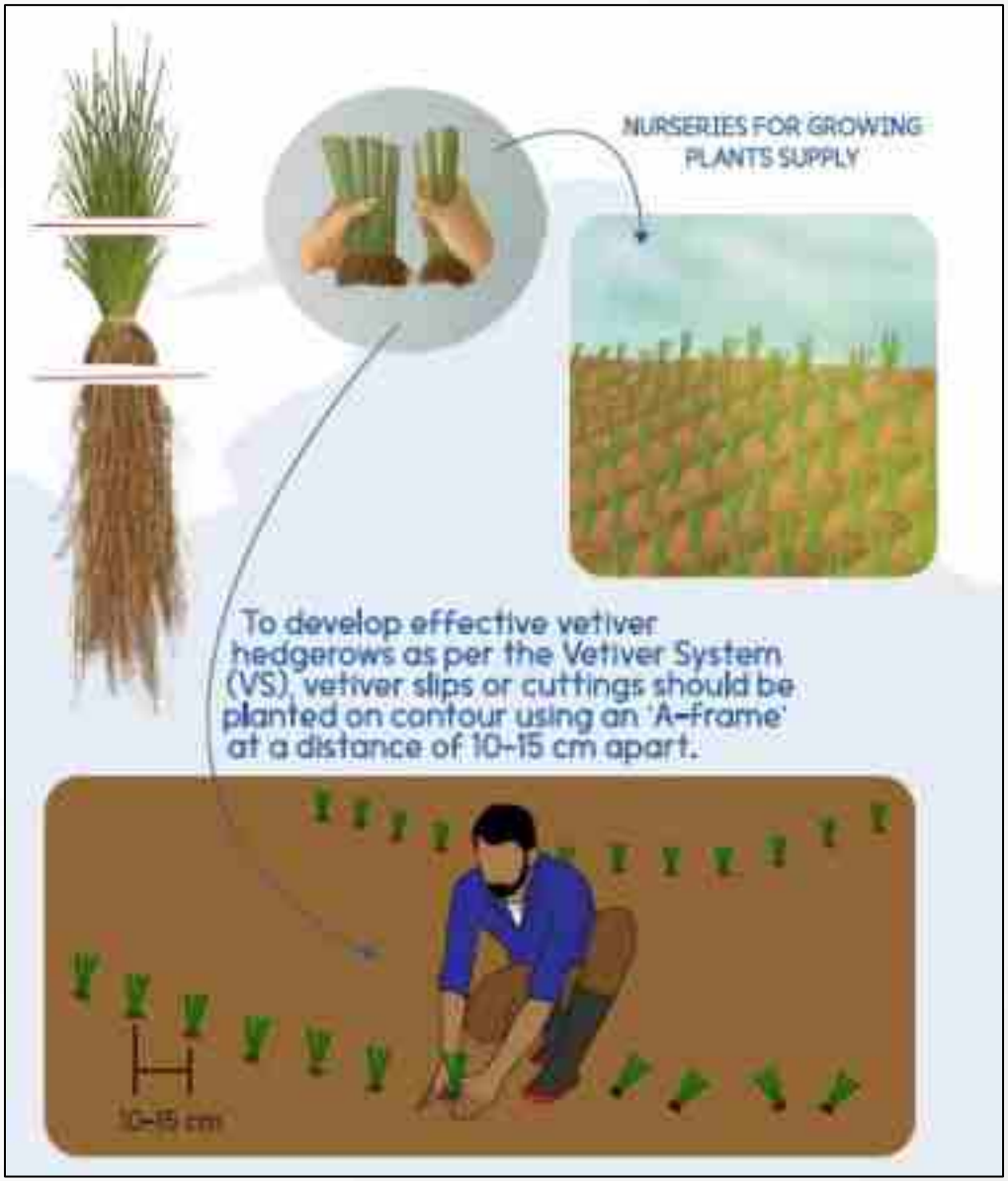

Atmospheric deposition
Monitoring station
Cultivated land runoff
Instream transport and removal
Urban runoff
Land to water transport
Cultivated land runoff
Wastewater discharges
Pasture land runoff
Monitoring station

VETIVER SYSTEM INSTALLATION

Install plants:

- ✓ **10-12 cm apart**
- ✓ **On contour where applicable**





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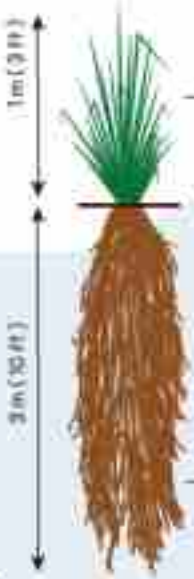
Vetiver leaves and **roots** can also be used in many ways to make different types of handicrafts.



LEAVES
CO_2 capture
Thatch roofs
Earth building
Handicrafts
Biomass

ROOTS
Handicrafts
Pest repellent
Essential Oils
Perfumes

- SLOPE STABILIZATION & EROSION CONTROL
- SOIL & WATER CONSERVATION
- TREATMENT OF CONTAMINATED LAND & WATER

LIVING PLANT
Ecological Engineering Solutions

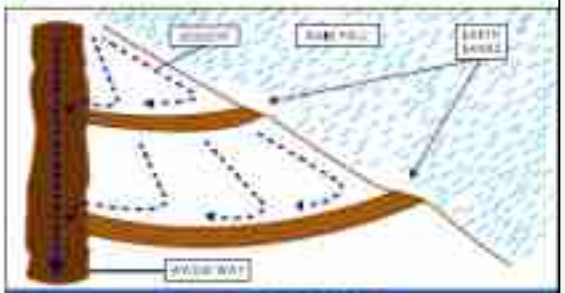
THE VETIVER SYSTEM (VS)

NURSERIES FOR GROWING PLANTS SUPPLY

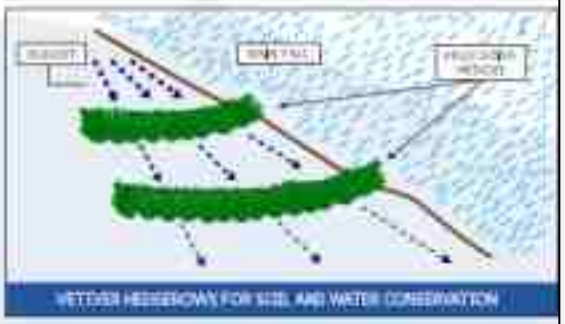
To develop effective vetiver hedgerows as per the Vetiver System (VS), vetiver slips or cuttings should be planted on contour using an 'A-frame' at a distance of 10-15 cm apart.

- Maintenance to young plants is needed in early stages to prevent overgrowth, until they are well established.
- To speed up establishment fertilizers and soil amendments like Liquid Litter and Agricol can be applied.
- Vetiver is susceptible to grass weed-kill, and especially glyphosate like all other plants. Where vetiver grass is implemented, it is therefore very important to avoid spraying these chemicals directly on the plants.

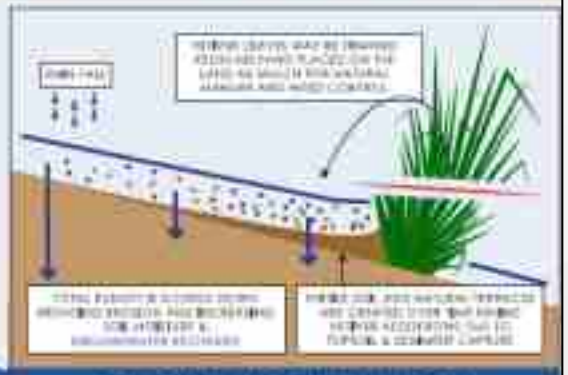
VETIVER GRASS USES



TRADITIONAL EARTH DRAINS



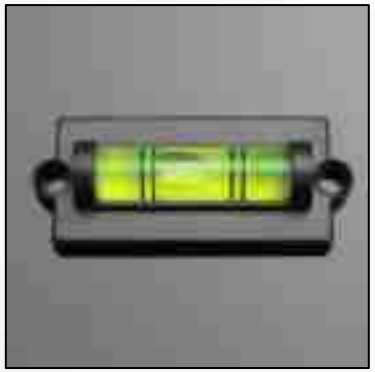
VETIVER HEDGEROWS FOR SOIL AND WATER CONSERVATION



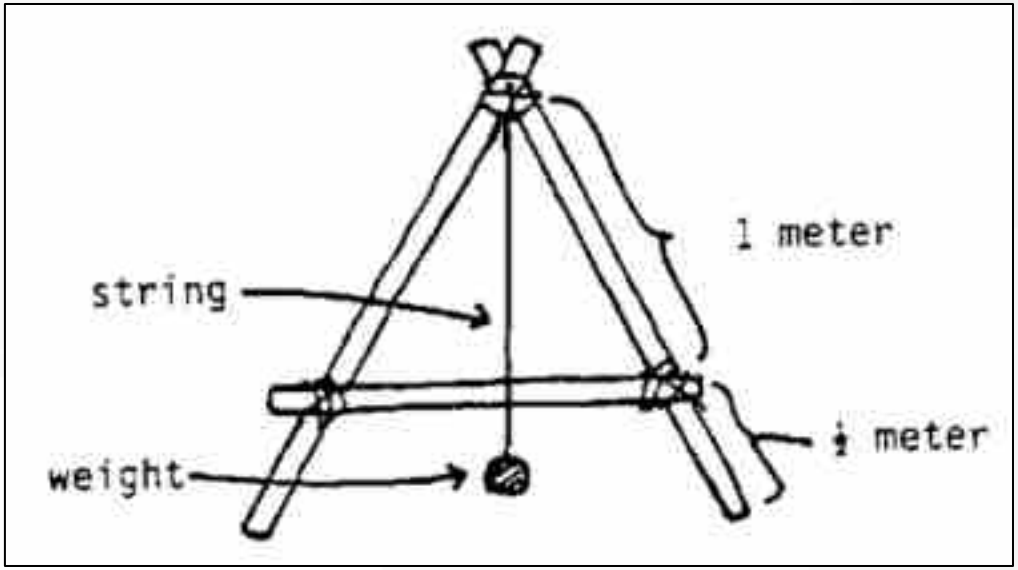
TOPSOIL CAPTURE AND GROUNDWATER RECHARGE

VETIVER SYSTEM INSTALLATION

Planting on Contour Using an A-Frame



A-Frame Tool for Contour Mapping



A-Frame Tool for Contour Mapping

GEF SGP UNDP and EMA-IWEco
Rehabilitation of Quarries (ROQ)

IWEco TT Rehabilitation of Quarries (ROQ) Project

IWEco TT Rehabilitation of Quarries (ROQ) Project


4
2

Haiti | Dominican Republic

The Vetiver Network International
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www.tvnwi.org

Thank you!

www.tvnwi.org | www.iamovement.org | www.vetivertt.com

The Vetiver System (VS): Project Design + Installation and Maintenance during establishment, Nursery Propagation and Green Businesses / Sites Planning + tracker sheets

Canaries, Saint Lucia

20th August 2021

IAMovement

www.iamovement.org | www.vetivertt.com

Agenda

- *Nursery Propagation*
- *Project Design + Installation*
- *Maintenance during establishment*
- *Green Business Development*
- *Saint Lucia Project Sites + Scheduling*
- *Harness Demonstration*
- *Site visit (if practical)*
- *Plant preparation in nursery*

Digging up vetiver clumps from a traditional nursery

HOW MANY PLANTS??

Selecting the location for a vetiver nursery

- Quantity of land available
- Topography of the land
- Vehicular access to the nursery
- Abundance of sun
- Type of soil
- Existing vegetation
- Proximity of nursery from caretaker or nursery manager
- Water access for irrigation if necessary

CREATING A NURSERY

If land space is limited, then these numbers can change. However to create the most effective nursery for large scale, **for easy access** and **so plants can bush out fully**, these are the recommended spacing between plants

- **Spacing between rows: 1 m or 3 ft**
- **Plant spacing in each row: 50 cm or 1.5 ft**

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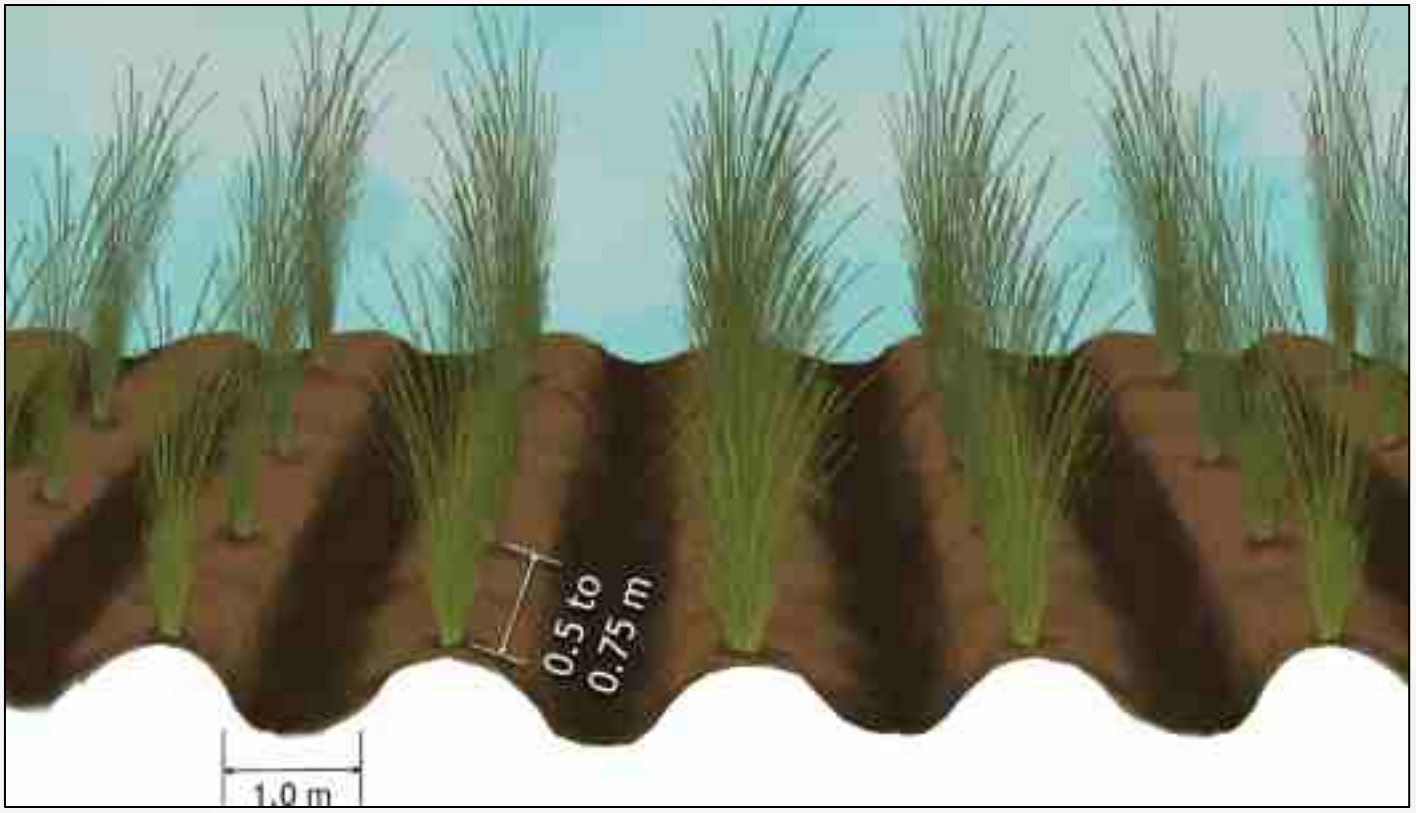


CREATING A NURSERY

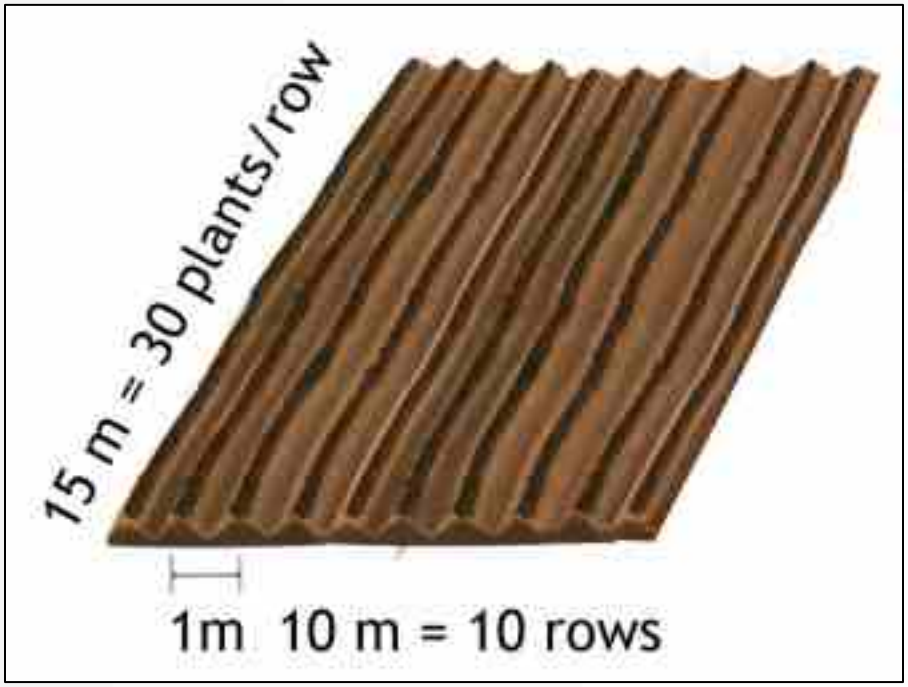
Generally:

- A plant which matures for **6 - 9 months with good soil, sun and water** (and fertilizer if soil is poor) can produce about **50 new slips**

- A plant which matures for **1.5 years** can produce about **100 new slips**

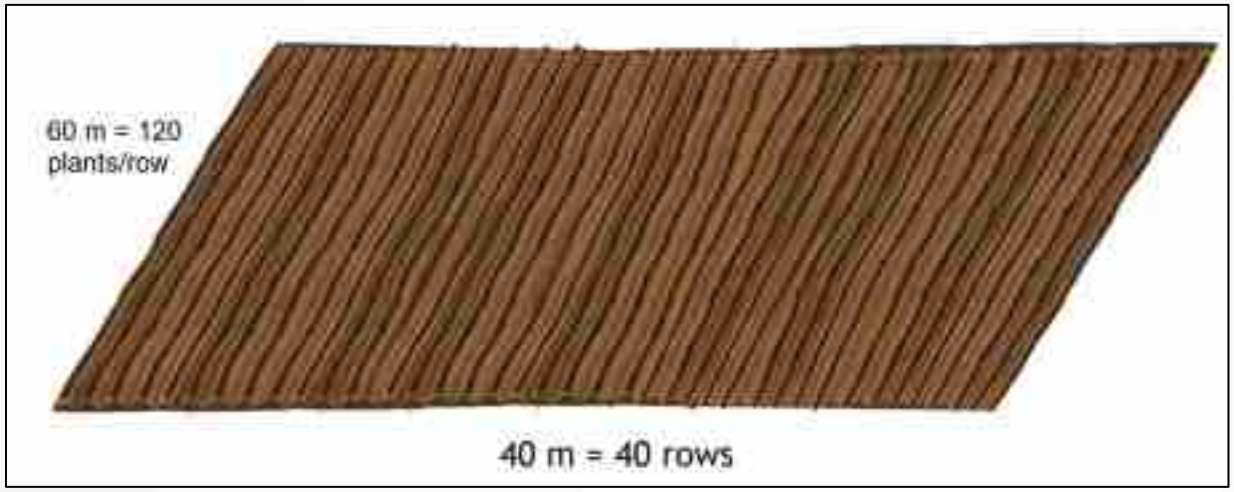
These numbers can be higher for plants in very good soil and/or which are fertilized well

Small Private or Community Nursery



- 10 m = 10 rows
- 15 m = 30 plants per row
- 10 x 30 = 300 starter plants
- After one (1) year, how many new slips can be produced?
- 300 starters x 50 slips per clump = 15,000 slips
- After two (2) years, how many new slips can be produced?
- 300 starters x 100 slips per mature clump = 30,000 slips

Large Commercial Nursery



- 40 m = 40 rows
- 60 m = 120 plants per row
- 40 x 120 = 4800 starter plants
- After one (1) year, how many new slips can be produced?
- 4800 starters x 50 slips per clump = 240,000 slips
- After two (2) years, how many new slips can be produced?
- 4800 starters x 100 slips per clump = 480,000 slips

Vetiver Nurseries

Pre-establishing plants in trays or bags

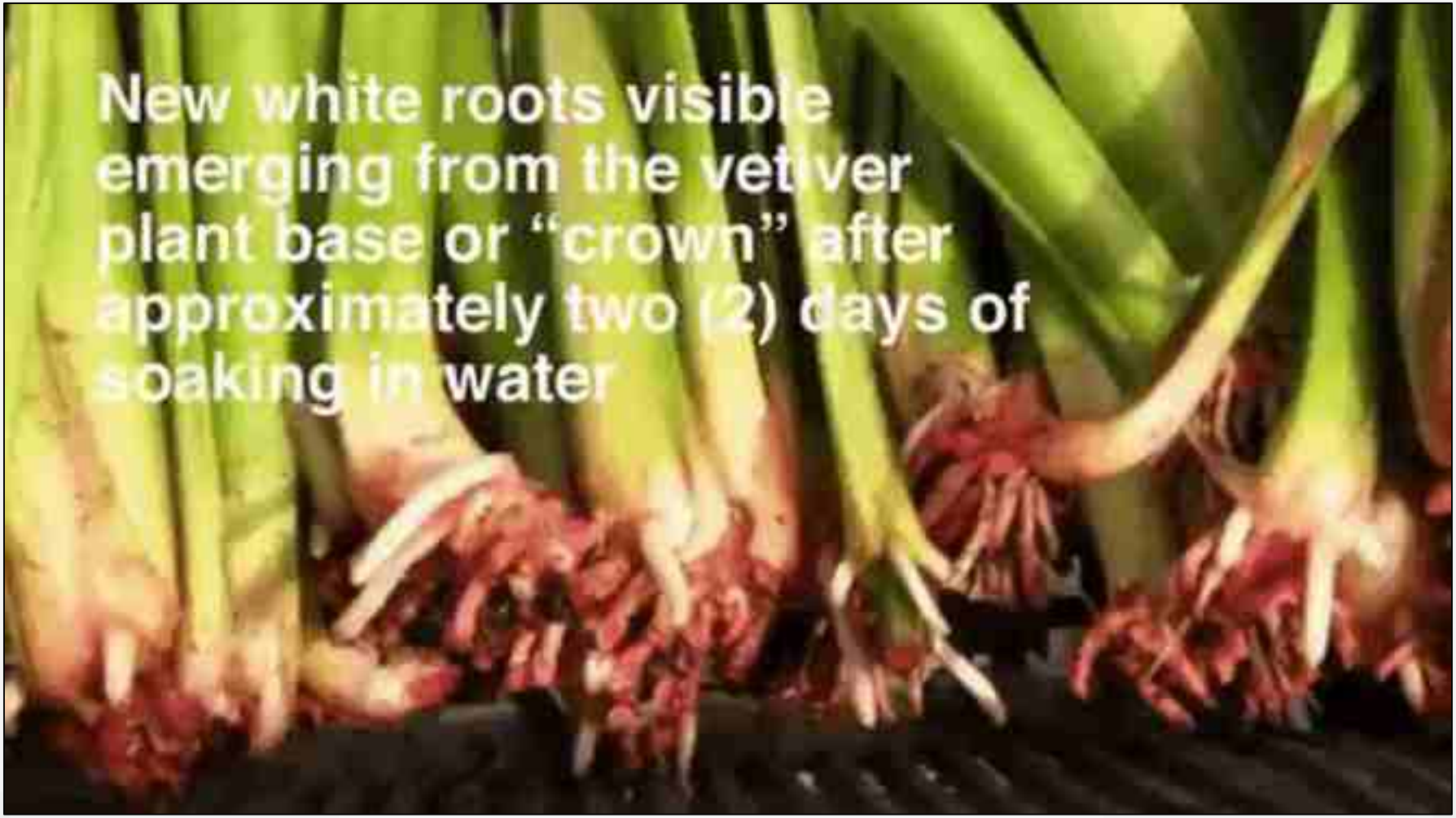

Vetiver slip
leaves
10 cm Length
Vetiver slip
roots
5 cm Length


1

New vetiver plant (slips) cut with cutlass on piece of wood (10 cm or 4 inches length, 1 inch roots), and placed to soak in container for 2-3 days to stimulate new root growth

New vetiver plant (slips) bundles of 20 plants each, soaking in water basins for 2 days to stimulate new root growth

New white roots emerging after 2 days soaking in water



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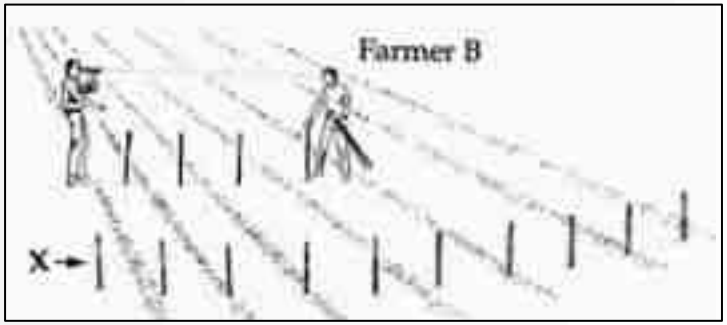

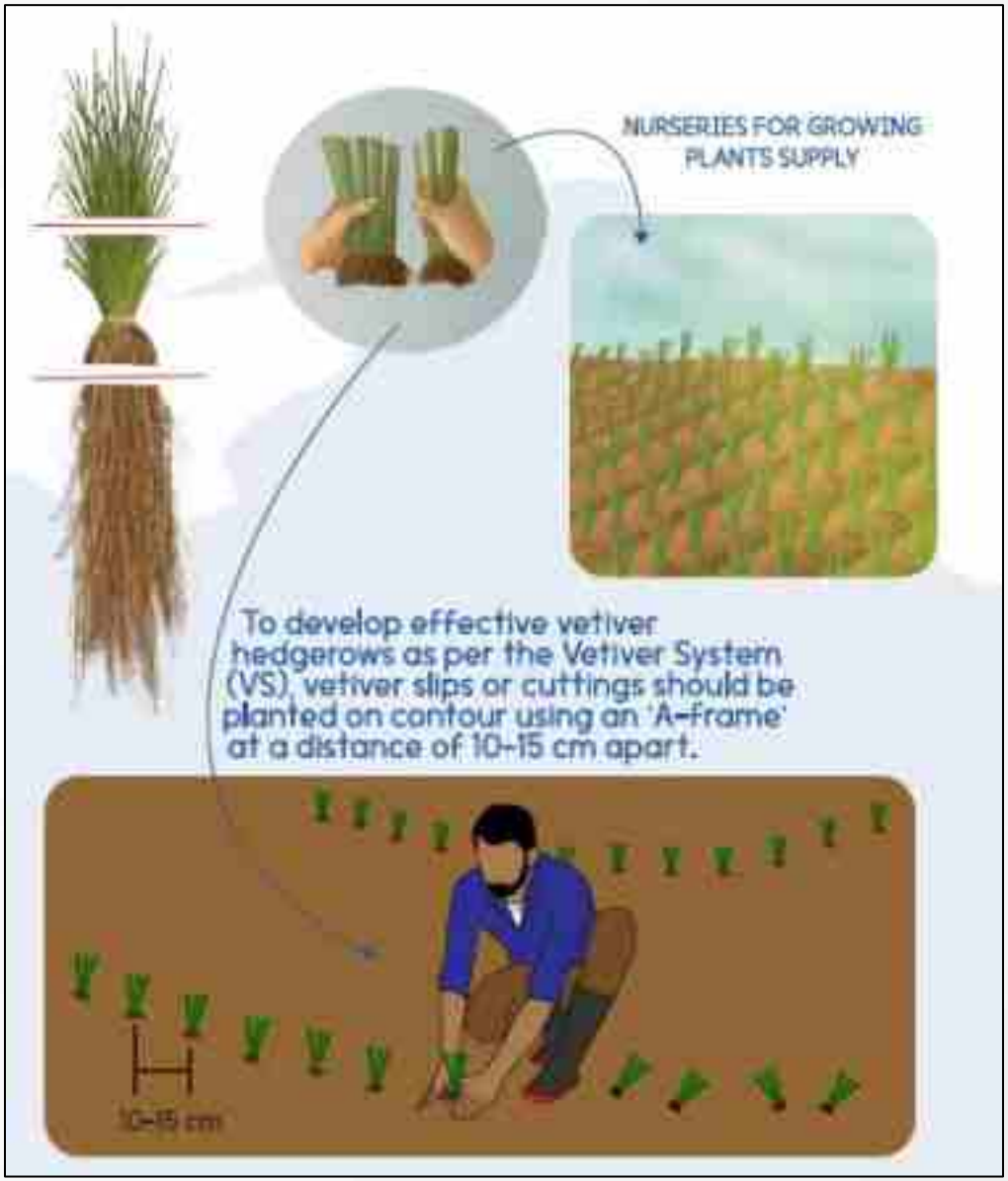

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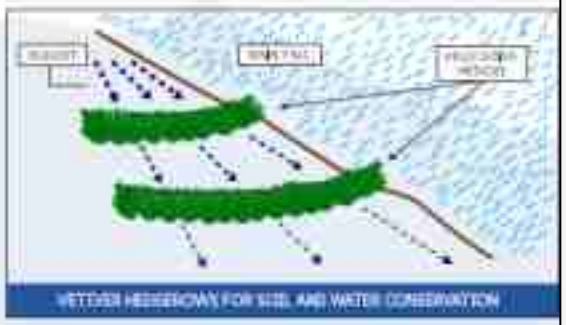
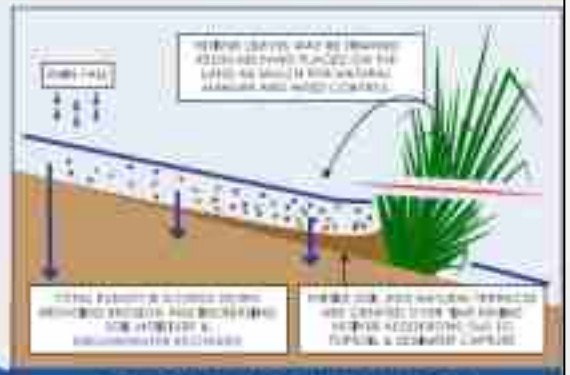


VETIVER HEDGEROWS FOR SOIL AND WATER CONSERVATION



TOPSOIL CAPTURE AND GROUNDWATER RECHARGE

LAND PREPARATION for INSTALLATION

- ✓ *Chop or weed-wack to the ground and remove cut bush*
- ✓ *Use shovel or hoe to remove top vegetation where plants will be installed*

If land is already cleared and there is no existing major vegetation, just small weeds, then no additional land preparation is needed.

LAND PREPARATION for INSTALLATION

Clearing: Vetiver doesn't grow well in shade – need to remove competition for young plants

What do we need?
(Tools, Equipment + Materials)

1. Vetiver plants
2. Manure/Soil Amendments
3. Luchette/cutlass/diggers
4. Hoe to remove weeds/clear soil
5. Fertilizers (spray can)
6. Soil amendment (Cal or Ash)
7. Vetiver leaves or similar for mulching
8. Watering can, or irrigation system

Residential Project Installation

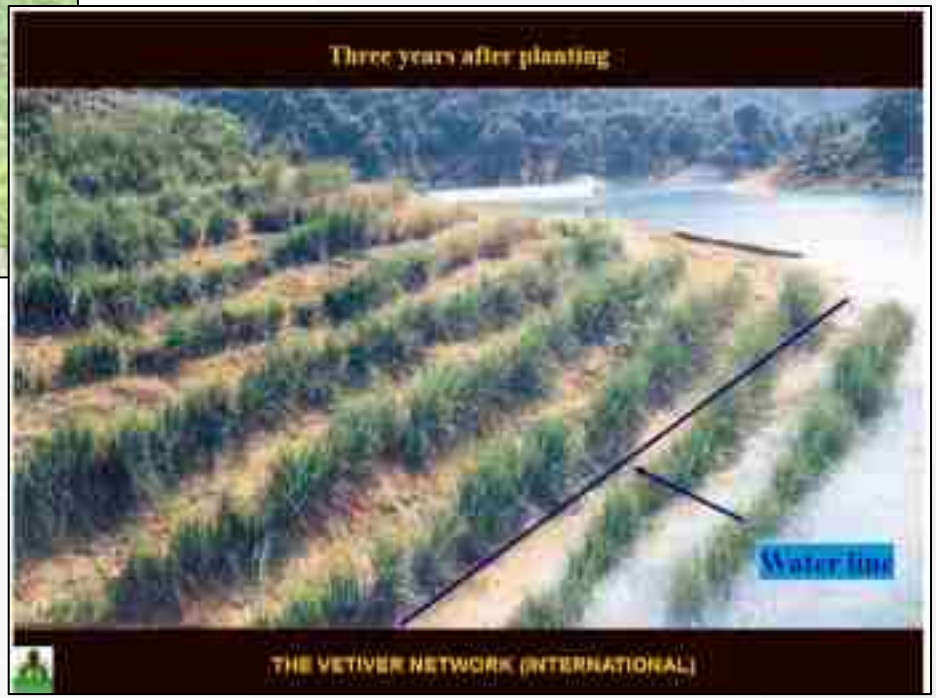
Residential Projects

Residential Projects

Residential Projects

Riverbank Protection

VS survives 2-4 months underwater



Slope Stabilization

La Grecia, Costa Rica

MAINTENANCE DURING ESTABLISHMENT
(first 6 MONTHS; and afterwards)

- ✓ *Water plants if needed to compliment the rains*
- ✓ *Remove weeds/vegetation overgrowth*
- ✓ *Fertilize, add mulch and soil amendments (lime)*
- ✓ *Trim hedges at 3-4 months old, and after that a minimum of once/year; or more frequently as preferred to maintain aesthetic*

Landscaping

Landscaping

Landscaping


RIS

Green Businesses with Vetiver grass

- *Cost-effective green engineering solutions*
- *Handicrafts*

Vetiver TT costing ($USD)

Vetiver System (VS) cost - less per sq ft than *rolled lawn grass*

Project design • Light vegetation removal • Vetiver plants supply and installation
Soil amendment and fertilization • One year maintenance during establishment

Total number # of plants	COST ($TT) per established plant	COST ($TT) per square meter ($m^2$)	COST ($TT) per square square foot (sq ft)	TOTAL PROJECT AREAS (corresponding to given number # of plants)		
				Area (m^2)	Area (sq ft)	Area (Acres)
10,000	$19.88	$159.00	$14.75	1,250	13,450	0.31
20,000	$18.50	$148.00	$13.75	2,500	26,900	0.62
30,000	$17.88	$143.00	$13.25	3,750	40,350	0.93
40,000	$17.13	$137.00	$12.75	5,000	53,800	1.24
50,000	$16.88	$135.00	$12.50	6,250	67,250	1.54

Vetiver TT also offers combined solutions where applicable and can provide the following additional products and services:

Irrigation systems • Earthworks for land preparation and terra-reformation
Large vegetation removal • Geotextiles • Coconut-fiber matting
Temporary silt fences • Gabion baskets • French drains

Vetiver TT Quotations

Vetiver TT
Ecological Engineering Solutions Ltd

QUOTATION: 2020_39 Dan Martineau, Seaview Gardens Date: 16-Sep-20

PROJECT SCOPE: Supply and install of the Vetiver System (VS) hedgerows for slope stabilization and erosion control on benched slopes

Item	Description	Quantity notes	Total
1	Total number of Vetiver Plants 6 hedgerows @ 12 m length; 8 plants/m 1 hedgerow @ 20 m length; 8 plants/m	736 plants @ $5/plant	$3,680.00

Vetiver TT Quotations

2	Project design & management: Vetiver System (VS) installation incl labour, supervision, transport and logistical costs, daily expenses	1-Supervisor, 3-Installation Crew (1 day)	$2,500.00
3	Soil/Manure, Fertilizers & Soil Amendments, water retention crystals - supply and application	LS	$300.00
4	Two (2) return visits over three (3) month period after installation: to replace dead plants if applicable, re-fertilize, remove vegetation overgrowth, and train client on long term best-care-practices	1-Supervisor, 2-Maintenance Crew (2 days)	$2,500.00
		TOTAL	**$8,980.00**

NOTES:

1) Appropriate Health and Safety Equipment will be used where necessary.

2) Vetiver Hedgerows will be installed in hedgerow formation according to the Vetiver System (VS), or according to other specifications as required

COMPLETION SCHEDULE

Vetiver TT Quotations

4	Supply and installation of drip irrigation system: PVC, drip lines, valves, battery operated timer, 2000 gal tank rental (16 drip lines for hedgerows on main slope; 3 drip lines for hedgerows on side slope)	Materials supply; and 1-Supervisor, 3-Installation Crew (2 days)	$12,900.00
5	1-month truck borne water refill supply for 2000-gal tank and timer-operated irrigation system (est. 10 refills)	LS	$7,500.00
6	Geotextile fabric (26 m x 2 m), with anchoring pins (approx 50)	LS	$1,000.00
7	Soil/Manure, Fertilizers & Soil Amendments - supply and application	LS	$1,700.00

HOUSE OF VETIVER

Vetiver Handicrafts

Leaves drying for handicraft making

Vetiver Handicrafts


VETIVER
SOAP


VETIVER SOAP


SOAP

Vetiver Oil Home Distillation

Saint Lucia Sites for VS-EbA interventions

1. Anse La Raye Quarry
2. Anse La Verde Roadside
3. Belvedere, Canaries
4. Canaries River Mouth
5. Presbyterian Church Yard, Canaries
6. Flora Villa Site 1
7. WASCO Sites, Sediment Dam + Roadside
8. Canaries Water catchment (up river)
9. Anse La Raye Riverbank w/ gabion baskets
10. Anse La Raye Hillside Property
11. Agricultural Plot
12. Hillside homes, Canaries

Week-2 Schedule

Monday 23rd Sept **- Anse La Raye Quarry**

Tuesday 24th Sept **- Anse La Raye Quarry, Canaries Rivermouth, and Anse La Verde Roadside**

Wednesday 26th Sept **- Anse La Raye Quarry**

Thursday 27th Sept **- WASCO Sites, Sediment Dam + Roadside**

Friday 28th Sept **- Presbyterian Church Yard, Flora Villa Site, and Hillside Homes, Canaries; and visit to Agricultural Plot**

Strengthening Coastal and Marine Climate Resilience through Upland and Coastal Ecosystem Based Adaptation and Community Engagement

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Vetiver Hedgerow Installation Tracker

Country: Saint Lucia

Date	Location (address/GPS)	No. of Vetiver plants installed	Spacing of plants (e.g. 4 inches)	Comments

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