

## CLIMATE CHANGE ADAPTATION & DISASTER RISK REDUCTION

### END OF PROJECT REPORT FOR COMPONENT 1- FORESTRY DEPARTMENT

March 2014



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## *I. Project Background information*

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1.1 Project title: *Climate Change Adaptation & Disaster Risk Reduction*

1.2 Project number (if applicable :

1.3 Responsible Agencies: *Planning Institute of Jamaica, United Nations Environment Programme, Forestry Department, National Environmental & Planning Agency, and Environmental & Management Division*

1.4 Project starting date: *October 18, 2010*

1.5 Project completion date: *December 28, 2013*

1.6 Reporting period: *October 2010-December 30, 2013*

1.7 Reference to UNEP Subprogrammes and expected accomplishments:

1.8 Overall objectives of the project: *(maximum quarter of a page):*

**To adapt to climate change and contribute to sustainable development in Jamaica, particularly in vulnerable communities, through increasing resilience and reducing risks associated with natural hazards**

### **Specific Results:**

- Reduce downstream run-off and associated negative environmental and human impacts through rehabilitation and improved management of selected watersheds;
- Increase resilience of coastal ecosystems to climate change impacts through restoration and protection of selected ecosystems;
- Enhance institutional and local-level capacity for climate change adaptation and disaster risk reduction through increasing capabilities and raising awareness.

### **Project activities specific to Component 1-Forestry Department:**

**Result 1:** Rehabilitated watersheds through slope stabilization measures such as reforestation of denuded hillsides. Improved slope stability will reduce the occurrence of landslides, downstream flooding and sedimentation of important aquatic systems such as

the sea and rivers; facilitate improvement in watershed management; and reduce the physical and social vulnerability of associated communities. The main approach of this activity is to engage in the direct production and planting of seedlings in severely degraded watersheds as a means of reducing risks to climate change. The activities will contribute to ecological restoration derived from the planting of species that provide additional benefits such as bird feeder trees, nutrient enrichment of soils, leaf litter production to enhance water retention, slow erosion and carbon sequestration which can contribute to climate change mitigation. This will be complemented by a forest fire management programme to reduce health risks and also associated CO<sub>2</sub> emissions. Further facilitation of community-based management groups will be undertaken as an institutional approach for ensuring sustainability.

Indicative activities include:

1. Facilitating the establishment and improvement of community-based management structures or organizations
  - a. to promote sustainable environmental practices, increase awareness and assist with the enforcement of relevant legislation in communities in the selected Watershed Management Units (WMUs) namely Hope and Yallahs River WMU, and White River/ Rio Bueno WMU;
  - b. three Local Forest Management Committees (LFMCs) will be established.
2. Procuring seeds to restore 300 hectares of degraded watersheds lands
  - a. approximately 300,000 seedlings will be produced;
  - b. will involve the planting/establishing of suitable tree species and other vegetative cover;
  - c. Yallahs River, Hope River, Buff Bay/Pencar and Rio Bueno River WMUs will be targeted.
3. Promoting agroforestry practices in the selected WMUs
  - a. to reduce destruction of natural forests;
  - b. will involve distribution of 35, 000 fruit tree seedlings and 35, 000 timber trees;
  - c. emphasis will be given to Yallahs River WMU;



- d. will have a double impact of increasing crop production, and improving livelihoods of the associated communities.
- 4. Comprehensively assessing all forested crown lands and developing a geo-referenced database
  - a. to determine status of forested lands; and
  - b. to assist in the prioritisation of and planning for appropriate interventions, such as reforestation.
- 5. Declaring an additional 2600 hectares of Forest Reserves and Forest Management Areas
  - a. to halt and reverse the loss of biodiversity. This is a priority action identified under the National Biodiversity Strategy and Action Plan, and the National Forest Management and Conservation Plan (NFMCP).
- 6. Developing a comprehensive Forest Fire Management Programme
  - a. inclusive of mapping areas most at risk, and the installation of fire break mechanisms both physical and biological) for targeted areas with all relevant stakeholders.
  - b. will help to reduce the incidence of fires and resultant health impacts and CO<sub>2</sub> emissions.
- 7. Promoting the development of sustainable livelihood/economic activities through conservation and environmental management programmes
  - a. will involve collaboration with NGOs;
  - b. will draw on lessons learnt from similar activities.
- 8. Establishing river protection infrastructure/structures in selected areas
  - a. to minimize erosion and flooding;
  - b. Dallas/Constitution Hill proposed area

### *Changes to indicative activities as a result of request to amend logframe:*

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At the end of year I the Agency made a request to the Project Management Unit for several changes to the indicative logframe activities as follows. This request saw among other changes, a reduction in the number of indicative activities from 8 to 7 as the Agroforestry & Livelihood components were merged to facilitate greater effectiveness and benefits from the programme. The amended indicative activities are as follows:

1. Facilitating the establishment and improvement of community-based management structures or organizations
  - a. to promote sustainable environmental practices, increase awareness and assist with the enforcement of relevant legislation in communities in the selected Watershed Management Units (WMUs) namely Hope and Yallas River WMU, and White River- Rio Bueno WMU;
  - b. Four (4) Local Forest Management Committees (LFMCs) will be targeted**
2. Procuring seeds to restore **400 hectares** of degraded watersheds lands
  - a. approximately **400,000 seedlings** will be produced;
  - b. will involve the planting/establishing of suitable tree species;
  - c. Yallahs River, Hope River, Buff Bay/Pencar and Rio Bueno River WMUs will be targeted.
3. **Agroforestry/ Sustainable Livelihood activities practiced in selected WMUs with priority focus on the Yallahs River WMU;**
  - a. One (1) Demonstration plot developed in each of the four (4) LFMC communities
  - b. 65,000 seedlings distributed to farmers.
  - c. 200 farmers from all four LFMCs registered in Agroforestry and/or Sustainable Economic activities programme.
  - d. Two community workshops held in partnership with NGOs/CBO to promote Agroforestry and/or Sustainable economic activities
4. Comprehensively assessing all forested crown lands and developing a geo-referenced database

- a. to determine status of forested lands; and
- b. to assist in the prioritisation of and planning for appropriate interventions, such as reforestation.

**5. Listing and description of 2,600 hectares of Crown Lands submitted for Ministerial approval for Declaration as Forest Reserves / Forest Management Areas**

- a. to halt and reverse the loss of biodiversity. This is a priority action identified under the National Biodiversity Strategy and Action Plan, and the National Forest Management and Conservation Plan (NFMCP).

**6. Developing a comprehensive Forest Fire Management Programme**

- a. inclusive of mapping areas most at risk, and the installation of fire break mechanisms both physical and biological) for targeted areas with all relevant stakeholders.
- b. will help to reduce the incidence of fires and resultant health impacts and CO<sub>2</sub> emissions.

**7. Establishing river protection infrastructure/structures in selected areas**

- a. to minimize erosion and flooding;
- b. Dallas/Constitution Hill proposed area

**1.9 Total budget (Euros €): (specify contributions by national government):**

European Union- €4.13 million

United Nations Environment Programme (In-Kind): -€0.075 million

Government of Jamaica (In-kind)- € 0.277 million

**Total: € 4.482 million**

## *II. Partners, Stakeholders and leveraged resources:*

*(Describe collaboration with partners. Specify implementing agencies as well as cooperating organizations and state their role.)*

<b>Partnerships, Stakeholders linkages, inter-agency collaborations</b>	<b>Impact on/Contribution to Project Outcome</b>
ACDI/VOCA-USAID	Facilitated farmer field school workshops which provided valuable training to support the livelihood & agroforestry component. The organization through project financing under the Jamaica Rural Economy & Ecosystems Adapting to Climate Change (Ja REEACH) project will also facilitate the execution of three (3) Train the trainer workshops in Forest Fire Management which could not be completed in time under this project.
Environmental Management Division (EMD) Ministry of Water, Land, Environment and Climate Change (MWLE&CC)	Co-implementing Agency
Ministry of Finance & Planning	The Ministry of Finance & Planning is responsible for all internal and external financing. They are represented on the PSC and play an important role in monitoring.
National Environmental & Planning Agency	Co-implementing Agency
National Land Agency (NLA)	Provided technical assistance with boundary demarcation.
National Works Agency (NWA)	Provided technical support with respect to procurement process for vehicles. The NWA also served as consulting partners for the establishment of river training works conducted in the project.
Other Stakeholders	This group included farmers, LFMC members, representatives of tertiary institutions and other NGOs who participated in workshops, training sessions and demonstration projects and



	supported the initiatives of the project.
Planning Institute of Jamaica (PIOJ)	As a responsible partner the PIOJ was responsible for overall project management through the established project management unit. The PMU provided guidance and monitoring on project implementation and coordination of activities.
Rural Agricultural Development Authority (RADA)	Provided support to the demonstration plots by means of training and technical support.
Social Development Commission (SDC)	Provided on the ground support with Agroforestry & Livelihood component working with consultant to engage LFMC community members.
Spatial Innovision Limited	Consultant hired for providing services in relation to the Geo-reference database & Surveying
United Nations Environmental Programme (UNEP)	As implementing partners the UNEP provided guidance on technical & financial aspects of project implementation
US Forest Service	Staff provided valuable input in the development of the Forest Fire Management Plan. Consultant hired for providing services in relation to the development of the Forest Fire Management Plan.
Windsor Research Centre	Facilitated presentation to members of the Sawyers (Trelawny) community as part of the Livelihood & Agroforestry component.

### III. Project status (activities & achieved results)

#### Final Project Status Report- As of December 30, 2013

Of the EIGHT (8) key activities listed in the project workplan, the Agency successfully achieved SEVEN (7), with one activity at partial achievement. Additionally several targets were exceeded.

2.1 Information on the delivery of the project			
Activities/Outputs (as listed in the Work Plan)	Status	Results	
		Objectively verifiable indicator of achievement	Overall Achievement/ Outcome
A. Establishment and/or strengthening of Local Forest Management Committees (LFMC) in selected Watershed Management Units (WMUs);	<b>Achieved</b>	4 Local Forest Management Committees established and or strengthened in targeted WMUs. LFMCs are to be formed in Westphalia (Yallahs River WMU) Dallas/ Constitution Hill (Hope River WMU) and Sawyers (White River/ Rio Bueno WMU).	Four (4) LFMC's successfully launched under the project: <ul style="list-style-type: none"> <li>• Two (2) in the Hope River WMU: <i>Dallas Castle, Constitution Hill</i></li> <li>• One (1) in the Yallahs River WMU: <i>Westphalia</i></li> <li>• One (1) in the Rio Bueno WMU: <i>Sawyers</i></li> </ul> <i>See attached Final Report on Establishment &amp; Launch of LFMCs</i>
B. Reforestation of selected Water Management Units undertaken	<b>Achieved</b>	400 hectares reforested in targeted WMUs: Surveying and Identification 400ha of lands Production of 400,000 seedlings	<ul style="list-style-type: none"> <li>• 405ha planted in Watershed Management Units (<i>See attached document: Means of Verification for the planting of 405ha Government Forest Estates.</i>)</li> <li>• 469.34 ha of crown lands identified &amp; surveyed.</li> <li>• 436,823 seedlings produced</li> </ul>

	<b>Achieved</b>	<p>Four (4) Nurseries to be Rehabilitated (Mount Airy, Williamsfield, Moneague &amp; Head Office)</p> <ul style="list-style-type: none"> <li>Nursery consultant-Burrell Scarlett hired on June 6, 2012 to review Forestry Department nursery operations and make recommendations for improvement. Final report with recommendations of consultant submitted to Agency on September 10, 2012. In May 2013 Burrowes &amp; Wallace Ltd (Quantity Surveyors) contracted to oversee and complete nursery rehabilitation. Brighton Engineers Limited sub-contracted on September 6, 2013 to carry out nursery rehabilitation works. Nursery rehabilitation completed in December, 2013. Nursery Rehabilitation activities successfully completed in December, 2013. The activities completed include:</li> </ul> <p>At Nursery located at 173 Constant Spring Road, Kingston 8:</p> <ul style="list-style-type: none"> <li>The fabrication &amp; installation of a shade house as a germination facility</li> <li>The construction of two designated covered areas with work benches; one for filling and seeding the seed trays; the other for fillings bags and transplanting young seedlings from the trays to the plastic pots for growing out in the nursery.</li> </ul>
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		<ul style="list-style-type: none"> <li>• The construction of a designated concrete area for the mixing of potting medium</li> <li>• Construction of offices and changing facilities for Nursery Staff</li> <li>• At Nurseries located at Mount Airy (Saint Andrew), Williamsfield ( Manchester), &amp; Moneague (Saint Ann):</li> <li>• Construction of work benches, with two shelves, to be used for the transplanting of the young seedlings from cell trays to plastic bags, for growing out in the nurseries. NB: Construction of mobile shade houses for the three rural (grow out) nurseries was deferred. The decision was made to carry out the hardening off process of the young seedlings in the germination facility/shade house. A ceiling made of shade cloth with 50% shade was installed below the clear plastic roof in 75% of the facility (3 quadrants); in the remaining 25% (one quadrant) a ceiling made of shade cloth with 30% shade. The seedlings will be kept in the quadrant with 70% light to allow for exposure to the additional light prior to being transferred to the nurseries for growing out.</li> </ul> <p><i>See attached Final Report</i></p>
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			<b><i>-Forestry Department Nursery Rehabilitation.</i></b>
C. Agroforestry/ Sustainable Livelihood activities practiced in selected WMUs with priority focus on the Yallahs River WMU	<b>Achieved</b>	<ol style="list-style-type: none"> <li>1. One (1) Demonstration plot developed in each of the four (4) LPMC communities</li> <li>2. 65,000 seedlings distributed to farmers.</li> <li>3. 200 farmers from all four LPMCs registered in Agroforestry and/or Sustainable Economic activities programme.</li> <li>4. Two community workshops held in partnership with NGOs/CBO to promote Agroforestry and/or Sustainable economic activities</li> </ol>	<ul style="list-style-type: none"> <li>• 65,200 seedlings distributed to farmers across all four LPMCs</li> <li>• 5 Demonstration plots established: 2 in Sawyers, Trelawny, 1 in Westphalia, St Andrew, 1 in Constitution Hill, St Andrew &amp; 1 in Dallas Castle, St Andrew.</li> <li>• 402 farmers from all four LPMCs registered in Agroforestry programme.</li> <li>• Seven (7) community workshops held in collaboration with NGOs &amp; CBOs with all four LPMCs to promote agroforestry &amp; sustainable livelihood. (These include work &amp; field days which also included presentations from other stakeholder groups)</li> <li>• *Apiary consisting of 10 colonies established at Constitution Hill. (This was an additional achievement- not stated in the indicative targets)</li> </ul> <p><b><i>See attached Final Report of Agroforestry &amp; Livelihood Component.</i></b></p>
D. 110,000 ha of Forested crown	<b>Achieved</b>	1. Target :100, 000 ha of Crown Lands assessed	<ul style="list-style-type: none"> <li>• <b>110,011.08ha</b> of crown lands assessed</li> </ul>



lands assessed and a geo-referenced database of crown lands developed.		2. 1 geo referenced database completed	<ul style="list-style-type: none"> <li>Land use/Cover Change Assessment project started in September 2012.</li> </ul> <p><i>See attached Final Report of Assessment of the Forest estate (2011-2013) &amp; Land Use Assessment Update Report</i></p>
E. Listing and description of 2,600 hectares of Crown Lands submitted for Ministerial approval for Declaration as Forest Reserves / Forest Management Areas	<b>Achieved</b>	<ol style="list-style-type: none"> <li>2,600 ha of Forest Reserves and /or Forest Management Areas legally described, listed and maps produced.</li> <li>Listing of 2,600 hectares of forested crown lands submitted to Minister for Declaration as Forest Reserves and or Forest Management Areas</li> </ol>	<ul style="list-style-type: none"> <li>3700 ha of Forest Reserves/Forest Management Areas legally described, listed &amp; maps produced.</li> <li>Listing of 3700 ha submitted to Minister of Water Land Environment &amp; Climate Change on June 13, 2013 for Declaration of areas as Forest Reserves (FR) or Forest Management Areas (FMA)</li> </ul> <p><i>See attached Copies of submission sent to Minister for Declaration</i></p>
F. Forest Fire Management Programme developed:	<b>Partially Achieved</b>	<ol style="list-style-type: none"> <li>Production of 6 maps detailing high risk areas for Forest fires to support development of Forest Fire management programme.</li> <li>One Forest Fire management programme developed.</li> </ol>	<ul style="list-style-type: none"> <li>Six (6) maps produced by Agency GIS unit detailing high risk areas for Forest Fires.</li> <li>US Forest Service consultant hired in July 2012 National Forest Fire Management Plan developed &amp; submitted June 13, 2013 to Agency.</li> <li>At close of project Forest Fire management training for local communities could</li> </ul>

		3. *Train Local Communities in Forest Fire Management.	<p>not be conducted. Significant delays were experienced as at the time in which the consultant was available to conduct the training; project funds needed to execute the activity was not available. Once funds were received the consultant was no longer available to conduct the training. Consultant would become available during the rainy season which would prove impractical for the simulation exercises. However, the activity will be carried out during the dry season (January to March 2014) under the JA REEACH project facility.<sup>1</sup></p> <p><i>See attached National Forest Fire Management Plan &amp; Supporting Documents</i></p>
G. River protection structures established.	<b>Achieved</b>	One community/WMU having river protection structures implemented.	<ul style="list-style-type: none"> <li>Contract signed with National Work Agency as consulting partners. They procured Metal Plus Engineering Limited to carry out construction works in Cane River, Dallas Castle St Andrew. Work commenced</li> </ul>

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<sup>1</sup> Jamaica Rural Economy & Ecosystems Adapting to Climate Change (Ja REEACH) ACDI/VOCA project is a one year facility supported by USAID

			<p>on September 17, 2013 and was completed on November 16, 2013.</p> <p><i>Final Report - Retaining Wall and River Training Works - Cane River Management Unit - Dallas Castle, St Andrew</i></p>
H. Establishment of 21 Permanent sample plots and monitoring plots	<b>Achieved</b>	<ol style="list-style-type: none"> <li>1. 21 Permanent Sample Plots (PSP) lined out.</li> <li>2. Baseline data documented for 21 PSP plots</li> </ol>	<p>A total of 21 permanent sample plots erected and baseline measurements taken. Plots to be monitored.</p> <ul style="list-style-type: none"> <li>-6 plots located in Bellevue</li> <li>-Grand Ridge, St Andrew</li> <li>-3 plots located in Moy Hall, St Andrew</li> <li>-3 located at the Blue Mountain Peak, St Thomas.</li> <li>-3 located in Grants Pen, St Thomas (Mangrove Forest)</li> <li>-3 located in Hyde Hall, Trelawny</li> <li>-3 located in Stephney Johns Vale St Ann.</li> </ul> <p><i>See attached Final Report on the Establishment of Permanent Sample Plots</i></p>

#### ***IV. Pictorial Highlights of Project Achievements:***

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##### ***➤ Local Forest Management Committees Formed:***

*Photo showing members of the Westphalia, St Andrew LFMC:*



*Photo showing members of the Dallas Castle, St Andrew LFMC:*





➤ ***Reforestation:***

*Photo showing denuded hillside area (destroyed by fire) in St Andrew:*

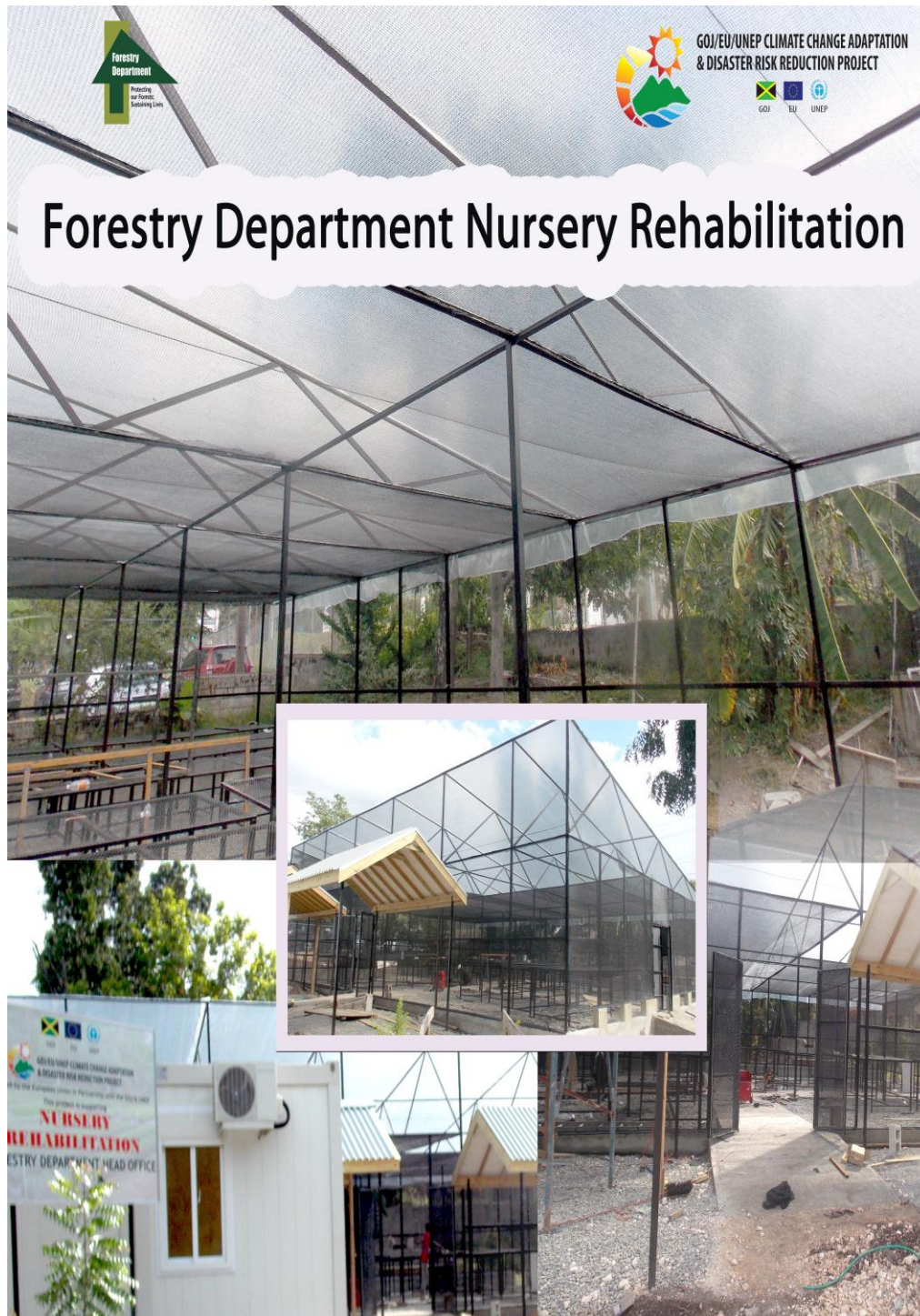


*Photo showing area in Bellevue St Andrew reforested under the project:*





➤ *Nursery Rehabilitation:*



***Pictures of Nursery at 173 Constant Spring Road:***



Picture above showing:

- 1) *To the left of picture, containerized office solution (with shower & changing facilities) for Nursery staff.*
- 2) *In the center of picture, two designated covered areas with work benches; one for filling and seeding the seed trays; the other for fillings bags and transplanting young seedlings from the trays to the plastic pots for growing out in the nursery.*
- 3) *In the background of picture-completed shade house to be used as a germination facility*



*Picture below showing covered areas for filling & transplanting, as well as Shade house:*



*Picture below showing work benches, for the Moneague, Williamsfield & Mt Airy Nurseries:*





*Picture below showing completed Shade house at 173 Constant Spring Road:*



*Picture above showing inside Shade house:*





➤ *Agroforestry & Livelihood:*

*Photos showing Apiary established at Constitution Hill, St Andrew:*





*Photo showing participants at Field /Work Day held with Dallas Castle LFMCs under the project:*



*Photo showing signage of Demonstration plot at Sawyers, Trelawny:*





*Photo showing rows of MD2 Pineapple at Demonstration plot in Constitution Hill, St Andrew:*



*Photos showing participants at the Constitution Hill Agroforestry Workshop:*



*Photos showing livelihood participants receiving certification in Bee Keeping at Agroforestry Closing Ceremony held at the Forestry department Head Office:*





➤ *River Training at Dallas Castle- Cane River- in the Hope Watershed  
Management Unit:*

*Before: (Photo showing area in Cane River Dallas Castle St Andrew with major road breakaway)*



*After:*

*(Photo showing retaining wall structure established at Cane River, Dallas Castle St Andrew)*





*Photo showing side view of Retaining wall at Cane River, Dallas Castle St Andrew:*

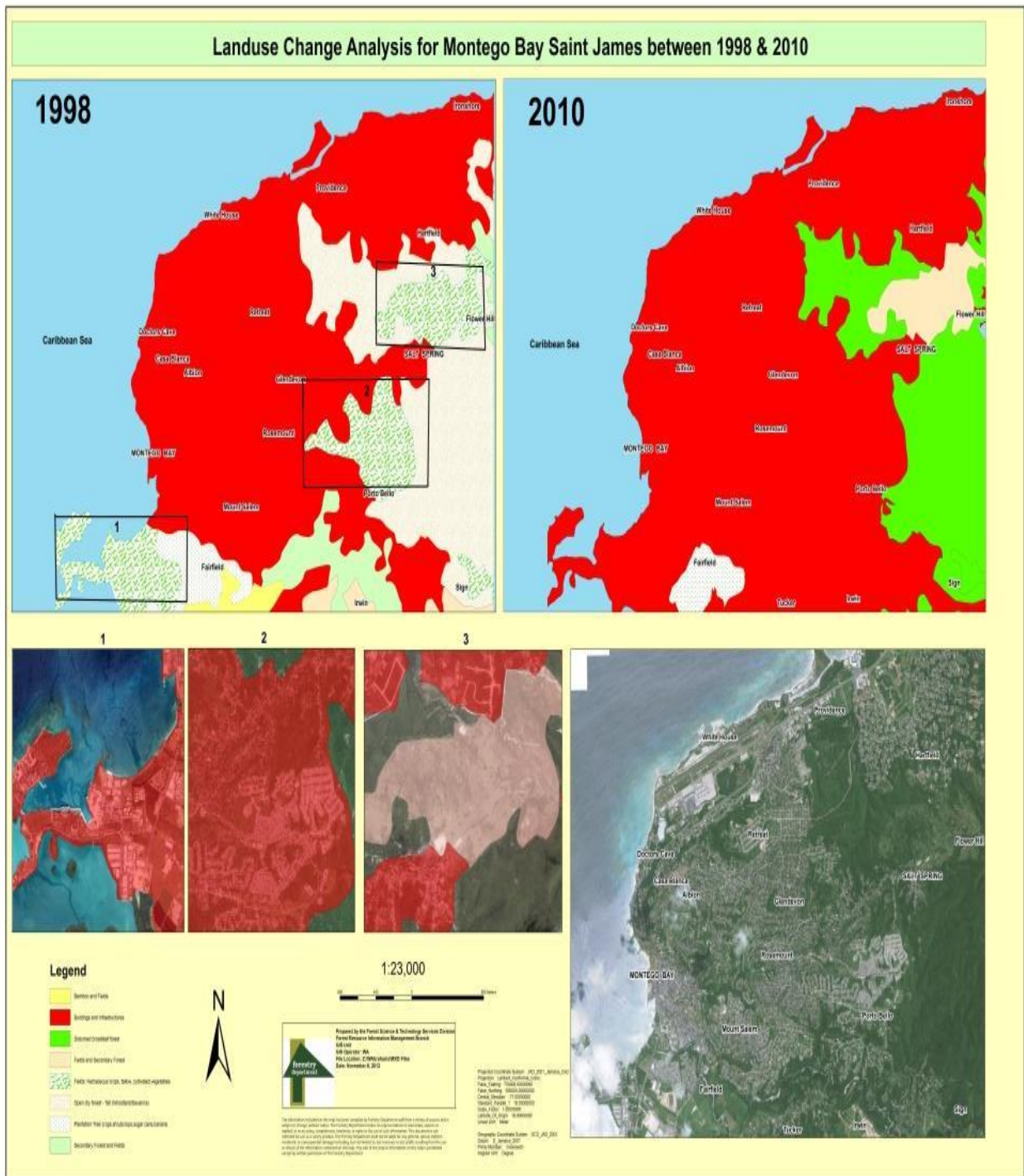


*Photo showing front view of Retaining wall at Cane River, Dallas Castle St Andrew:*





*Pictorial representation of Land use/Cover Change Assessment:*



## V. Final Project Tracker Summary:

Forestry Department -Report				
	Indicator	PROGRAMME TARGET /ACHIEVEMENTS		
		Overall TARGET	Target Achievement to December 2013	Percentage Achievement to December 2013 (%)
Component 1 - FD				
Establish & Strengthen LFMC	No. of LFMC established or operational in WMUs	4	4	100%
Reforestation in Selected WMU	No. of ha reforested in WMUs	400	405	101%
	No. Seedlings produced	400,000	436,823	109%
	No of Nurseries Rehabilitated	4	4	100%
Agro-Forestry & Sustainable Livelihood programmes in selected WMU promoted	No of demonstration plots established	4	5	125%
	No of farmers registered	200	402	200%
	No. of seedlings procured/distributed	65,000	65,200	100%
	No of Community workshops held in partnership with CBOs & NGOs	2	7	250%
Forest Crown Lands assessed	Target 110,000 hectares Assessed	110,000	110,011.08	100%
	No. of Geo Referenced Database Established	1	1	100%
Forest reserves declared	No. ha of forest reserves or forest management areas declared	2600	3700	142%
	Listing of areas to be gazetted submitted for Ministerial approval	1	1	100%
Forest Fire Management Programme Developed	No. of Forest Fire Mgt programmes developed	1	1	100%
	Maps Created	6	6	100%
	3 train the trainer Workshops* (Insufficient time to complete activity due to variable factors- Activity to be completed under JA REECH project)	3	0	0%
	Local personnel trained * (Insufficient time to complete activity due to variable factors- Activity to be completed under JA REECH project)	15	0	0%
Establishment of Permanent Sample Plots	# of Permanent Sample Plots Developed	21	21	100%
	No of reports documenting Baseline data for 21 plots	1	1	100%
River Protection Structures Established	No of community/WMU having river protection structures implemented	1	1	100%

## VI. *Lessons learned and best practices:*

<b>A. List of project's biggest successes</b>	
<b>Description</b>	<b>Factors that Promoted this Success</b>
The laying out and collection of Data from Permanent Sample Plots (PSPs)	<p>Teamwork. We employed post graduate students with experience in field work. They contributed significantly and garnered the forestry experience quickly.</p> <p>Tools and equipment were available.</p> <p>Availability of four wheel drive vehicles made access to the site manageable.</p> <p>Provisions for accommodation were made in relatively close proximity to the sites.</p>
Completion of the surveying of lands before the commencement of scheduled planting (467 hectares)	<p>The planning for the implementation of work was started six (6) months before the actual work began.</p> <p>GPS units and vehicles were available.</p> <p>Weather conditions were favourable.</p> <p>Accommodation was provided in close proximity to the work sites.</p>
Development and use of Silviculture Plans in the establishment of Plantation Sites	<p>The position of Silviculture Manager on the new structure allowed the Agency to introduce the use of silviculture plans (SPs) for the planted sites of the project. The plans were drafted in conjunction with inputs from the other divisions and were implemented immediately.</p> <p>As we progressed with the drafting of SPs, we were able to incorporate changes which were identified during the implementation of the earlier ones. However, these plans were being finalized by one person (Silviculture Manager) and at times affected the timeliness of the planting activity.</p> <p>Prescriptions in the silviculture plans which were adopted by the Agency have resulted in additional establishment costs. However the FD has been able to standardize the establishment procedures which will benefit all in the long term.</p> <p>Silviculture Plans have now become entrenched in our plantations establishment process.</p>
<p>The areas of the project which were under the sole control of the organization were implemented on time, such as:-</p> <ul style="list-style-type: none"> <li>- Rehabilitation of the 400 ha</li> <li>- Identification of 3700 hectares to be gazetted</li> </ul>	<p>Personnel assigned solely to this component. As the Agency had sole control for these activities there execution was better managed. This facilitated greater efficiency in achieving the targets</p>

**A. List of project's biggest successes**

<p>The collaboration with the United States Forest Service in developing the Forest Fire Management Plan.</p>	<p>The US Forest Service provided personnel with expertise in forest fire management and forest management planning to work alongside the contractor (a retired USFS employee) which the Agency identified.</p> <p>This has resulted in an increased awareness within the Agency of the need for forest fire management as an integral part of our forest management planning.</p>
<p>The establishment of the 400ha completed before the deadline.</p>	<p>The Agency re-deployed its Foresters and Forest Technicians from the north east region to the south east to assist the team in the south east. Each team was assigned to work at different locations. The north east team was provided with accommodation in close proximity to the sites.</p> <p>Integrated planning and innovativeness prior to the actual implementation of the project resulted in the Agency identifying planting sites and suitable species.</p> <p>The advanced production of the seedlings by the Agency up to six months before the project resulted in the timely availability of the required seedlings.</p>
<p>The number of farmers/community members registered under the agroforestry/livelihood activities surpassed the target.</p>	<p>The four LFMCs were launched in a timely manner with full involvement of the stakeholders.</p> <p>Close collaboration between the rural sociologists, agro-forestry specialist and the staff in the Forest Operations Division and the PR&amp;CC Branch.</p> <p>During stakeholder meetings, each LFMC identified the livelihood activities they were interested in.</p> <p>Project provided various fruit and timber tree seedlings to the beneficiaries.</p> <p>As a result of the activities of the agroforestry specialist, beneficiaries were trained in honey production and more sustainable farming practices. These will result in long term impacts for the community.</p> <p>The beneficiaries are now aware of the need for reforestation and are deriving economic benefits.</p>

### **A. List of project's biggest successes**

Overall effectiveness and allocation of resources to increase project outputs.	<p>The Agency was able to increase original targets under the project due to the effective allocation of resources with respect to two key activities:</p> <ol style="list-style-type: none"> <li>1. Reforestation-planting of hectares: Having successfully completed the planting of 220 ha in Year 1 of the project (April 2011-April 2012) the initial target of 300ha was increased by an additional 100ha. This new target was achieved by end of project and bolstered the Agency's overall reforestation targets.</li> <li>2. Listing and description of 2,600 hectares of Crown Lands submitted for Ministerial approval for Declaration as Forest Reserves/ Forest Management Areas: With the acquisition of key GPS &amp; GIS equipment under the project the Agency was able to undertake internal capacity building and utilize internal staff for the surveying of lands to be declared. This resulted in the elimination of high professional fees normally associated with this activity thereby increasing on the ground presence and efficiencies and allowing for the increase of the target from 2600ha to 3700 ha.</li> </ol>
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### **Project failures**

<b>Description</b>	<b>Factors that contributed to failures:</b>
<p>1) External contractors:</p> <ul style="list-style-type: none"> <li>✓ Consulting services for Geographic Information System</li> <li>✓ Consulting Services for the Re-opening of Forest Estate Boundaries</li> <li>✓ Contract for Project Management &amp; Consulting Services for the Construction of Gabion Walls &amp; River Training works at Hope River in Dallas Castle, St Andrew.</li> <li>✓ Consulting Services for the reopening of Forest Estate Boundaries.</li> <li>✓ Consulting Services for the development of Forest Fire</li> </ul>	<p>Contractors were unable to deliver in specified time hence resulting in an unofficial extension of timed projects.</p> <p>Lack of deliverables leading to unachieved targets.</p> <p>Shortened time frame in which to adequately assess the impact of the deliverables.</p>

Management Plan including 3 train the trainer workshops.	
2) Land Use Assessment Activity (apart of the establishment of a Geo-Reference Database)	<p>Missed the period for capturing cloud/shadow free satellite images (Jan-Feb each year) – late procurement due to delay in EU funding.</p> <p>High cloud coverage which prevented acquisition of new imagery.</p> <p>Procured one forest signature analysis software hence the assessment is limiting and confined to one person/computer thus extending the time frame for completion.</p>
3) NWA – Dallas Castle River Training Contract for Project Management and Consulting Services	<p>The start and completion of this activity has experienced significant delay as a result of varying factors. The Agency hired the national Works Agency as a Consultant tasked with the responsibility of completing the procurement process for a suitable contractor, equipped with the expertise to complete the Works in accordance with the technical specifications and at the cost estimated for the works. During the procurement process, the National Works Agency experienced many internal setbacks which compounded the delays in the completion of this project.</p> <p>As a result of the foregoing, the <b>Net effect</b> on the project is that it was not completed within the EU's September 30<sup>th</sup> deadline. However, the project was completed on November 16, 2013 within budget.</p>
4) Delay in the completion of the Nursery Rehabilitation Activity	<p>This activity was done in two (2) phases which resulted in significant delays.</p> <p>We would recommend in the future that nursery rehabilitation activity RFP should include all phases of the rehabilitation.</p>
<b>Other comments:</b>	
Project activities provided opportunities to document silvicultural activities which were never previously observed as well as adaptive strategies utilized.	



## VII. Sustainability

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*(State how the project has nurtured sustainability. Is the project or project methodology replicable in other countries or regions? If yes, are there any concrete examples or requests?)*

### ***Reforestation:***

Through its recurrent budget the Agency has committed to the maintenance of the 405 hectares planted under the project. To achieve full establishment areas planted must be weeded on average three (3) times for three (3) years. The Forest Operation Division of the Agency will be responsible for this activity which is incorporated in the Divisions annual work plans. A maintenance schedule for the areas planted has been developed.

### ***LFMCs Formed:***

The four (4) LFMCs formed under the project will join 13 other LFMCs established by the Agency since 2000. These LFMCs are supported in-kind by the Agency and monitored by the Rural Sociologists, Foresters-Client Services & Forest Technicians assigned to the region in which they are located. They are given technical and capacity building assistance as needed in carrying out their day to day functions and mandates.

### ***Forest Fire Management:***

The National Forest Fire Management plan developed will provide key & vital information with respect to forest fire management in the Forest reserves and Forest Management areas. The document will serve as a useful tool and be implemented in Forest Management Plans that are being developed by the Agency

### ***Agroforestry:***

The Agroforestry best practices techniques adopted in each LFMC saw the identification and establishment of demonstration plots. Five demonstration plots were established, these plots are owned by the farmer and his family, and monitor by the LFMC committee and forest technicians. A percentage of the profit (to be determined by each group) from crops sold will be used to finance the LFMCs future projects.

For the Agroforestry and Livelihood component, other sustainable methods identified were:

- The establishment of economic and marketable fruit trees and timber trees
- The introduction of intercropping orchards with cash and crops, for example sorrel, escallion peas, corn, pumpkin, plantain and banana.
- Contouring with pineapple suckers, the use of hybrid MD2 variety which is a high producer, the implementation of a revolving pineapple sucker planting programme, suckers will be available on a yearly to new members and existing members who did not receive an economic amount, thus increasing group membership.
- The implementation of sustainable land management practices

- The collaboration with ACDI/VOCA USAID in the Apiculture project. The Constitution Hill LFMC collaborated with ACDI/VOCA in the expansion of the bee project. This will lead to the establishment of more apiaries. As a result there will be more colonies established, thus increasing the number of persons benefiting over time and increasing the life of the project.

❖ *Project effectiveness/impact (How relevant is the project in terms of (national) capacity building objectives and the utilization of the technical, human and other resources available in the country?)*

- Reforestation of 405ha in the Yallahs River WMU, Hope River WMU and White River/ Rio Bueno WMU has contributed to the rehabilitation of the upper sections of the watersheds, and will aid in reducing downstream run-off and associated negative environmental and human impacts (including soil erosion) that affect nearby communities.
- Capacity building –Agroforestry practices awareness to climate change and protection of the environment, reforestation thus resulting in increasing ground cover and improved protection of our watershed management units. Training farmers to cultivate climate resilient crops, using improved agricultural techniques.
- Utilization of technical, human and other resources- The agroforestry intervention involved a combination of local timber trees, endemic fruit trees based on zoning and climatic conditions. Trees distributed were based on the history of the community, marketability and farmer interest. The activity also promoted erosion control through training in public education. Pineapple was planted to stabilize slope thus assisting in soil conservation. Timber and fruit combination was introduced to the cropping system to provide long term economic and environmental benefit. Pineapple production will form a revolving operation, existing farmers will assist new member with suckers thus sustaining project live, providing income, which will lead to poverty reduction within the communities involved. Technical data & resources acquired under the project will feed into the development of the Geo-referenced database and the land use assessment/ cover change project. The land use assessment project will provide valuable details on forested cover change for the island for the past ten (10) years. This analysis will provide national policy makers with information on the deforestation rates of the island.

## *VIII. Exit Strategy:*

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### **1. Monitoring required after the project has ended:**

- For the Agroforestry/Livelihood component monitoring of the demonstration plots is recommended for sustainability. One strategy is that the farmers who own the demonstration plots which are managed by the farmer themselves, are monitored by the LFMC members, as well as the Forest Technicians assigned to the Agency. The Ministry of Agriculture & Fisheries Apiculture Unit will monitor the apiary on a monthly basis based on requests made by the LFMC. The Forestry Department will continue working with communities in protecting the forest thus sustaining livelihood in associated communities. This relationship between the Agency and the forest communities will only get better and will eventually extend to other forest communities in Jamaica.
- Permanent Sample Plots will be monitored every five years and inventory data collected and analyzed.
- Maintenance plan developed for areas planted to be weeded to allow for establishment

### *Recommendations for future projects/programmes:*

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- Provide technical support service for agro forestry and livelihood activities
- Increase areas rehabilitated in other severely degraded watersheds
- Declare additional areas as Forest Reserves & Forest Management Areas
- Encourage rain water harvesting in Westphalia and other drought affected communities.
- Enhance/Expand the Geo-referenced database by expanding to an enterprise professional level enabling more simultaneous user access to multi user.

## ***IX. List of Means of Verification Documents submitted:***

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The following documents were submitted as part of the Means of Verification and supporting documents for the activities completed under the project:

1. Final Report on Establishment & Launch of Local Forest Management Committees
  2. Means of Verification for the planting of 405ha Government Forest Estates
  3. Distribution Listing for Seedlings
  4. Final Report on the Assessment of Forest Estates 2011-2013
  5. Land Use Assessment Update Report
  6. Geo-Database Development & Installation Report
  7. Forestry Department Nursery Rehabilitation Final Report
  8. Declaration of Forest Reserves/Forest Management Areas submissions
  9. National Forest Fire Management Plan for Jamaica including Risk/Vulnerability Maps & Supporting Document for Training
  10. Final Report on the Establishment of Permanent Sample Plots
  11. Report on Agroforestry and Livelihoods inclusive of workshop reports, lessons learnt, seedling distribution listing, demonstration plots with photos, sustainability & training manuals
  12. Final Report on Retaining Wall & River Training Works in Cane River Management Unit, Dallas Castle, St Andrew
- **Service contracts:**
    - Contract for Project Management & Consulting Services- Construction of Gabion Walls and River Training Works at Hope River in Dallas Castle St Andrew
    - Contract for Forest Fire Management Consultant (including Agreement to Amend)
    - Contracts for Nursery Rehabilitation (Burrell Scarlett, Wallace & Burrowes, Brighton Engineers)
    - Contract for Geographic Information Systems Consultancy
    - Contract for the Supply of Geo Satellite Imagery

- Consulting Services for the Reopening of Forest Estate Boundaries (including Agreement to Revive & Amend Contract)

**Authorized & Submitted by: Marilyn Headley**  
**CEO & Conservator of Forests**

A handwritten signature in black ink, appearing to read 'M. Headley', with a stylized, cursive script.

**Signature:**

**Date: March 2014**