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**RHODES UNIVERSITY SUSTAINABLE LAND MANAGEMENT FOR RURAL RESILIENCE PROJECT (RU-SLMRR), GEF5**

**QUARTERLY PROGRESS REPORT**

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**Report compiled by**: Dugal Harris

**Organization**:

**Quarter and year**: 032017

**Reporting outputs**: 3.1b

**Date of report:** 28082017

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# INSTRUCTIONS

# Please refer to Sections A-E below and include the necessary information and attachments to document your progress toward one or more outputs of the GEF5 SLMRR Project (use the examples provided to guide you).

# Please submit your completed progress report on or before the 12th day of the final month of a particular quarter. This is according to reporting regulations set by Department of Environmental Affairs for the GEF5 SLM Project.

# Please submit your report to: Rebecca Powell (rebeccajoub@gmail.com) and cc James Gambiza (j.gambiza@ru.ac.za).

# SECTION A: OUTPUTS PROGRESS & CHALLENGES (Please complete columns A-F in the table below)

**\***Progress toward achieving planned activities indicated in column C.

**\*\*** Challenges to achieving progress on activities, as identified in columns C and D

| AOutput code | BYR1 goals (deliverables) | CPlanned activities for reporting quarter | DProgress\*1 = completed, no concerns; 0.5 = partial progress, some concerns; 0 = no progress, major concerns | EChallenges\*\* | FAddressing challenges |
| --- | --- | --- | --- | --- | --- |
| 3.1b | Report on the development of a new carbon methodology for Spekboomveld rehabilitation projects and applicability to these kinds of projects | 1) Basic literature survey of remote sensing of biomass with multi-spectral imagery.2) Identify appropriate satellite image(s) for Mike Powell’s 2005 Baviaanskloof carbon stock ground truth (“2005 CS GT”) area.3) Field trip to gather sub-meter ground control points (GCP’s) for orthorectification and validation of satellite image.4) Acquire Quickbird satellite image of 2005 CS GT area.5) Orthorectify and radiometrically correct Quickbird satellite image.6) Conduct preliminary regression analysis on 2005 CS GT and corrected Quickbird satellite image.7) Basic literature survey for carbon stock inventory.8) Review standard operating procedure (SOP) for GEF5 carbon stock inventory.9) Generate plantable area map for GEF5 Baviaanskloof study site. | 1) 12) 13) 14) 15) 0.56) 0.57) 18) 19) 1 | 2) Imagery dates were limited to pre 2005 due to destructive sampling conducted from 2005 onwards. Only partial coverage of 2005 CS GT area was possible. Limited resolution of available satellite sensors for pre 2005 time frame.3) Land cover changes between present and date of image (2003) were unknown, making it difficult to identify landmarks that would have existed at the time of imaging. There were limited landmarks both clearly distinguishable on the ground and in the aerial imagery.4) Digital Globe initially provided the wrong image processing level (2A), preventing accurate orthorectification.5) Digital Elevation Model (DEM) inaccuracies impacted orthorectification accuracy and prevented precise location of 2005 CS GT plots.6) Corner locations of 2005 CS GT plots were unavailable preventing precise plot location and impacting correlation strength. | 2) Identified a compromise area containing a substantial portion of the 2005 plots that was covered by a 2003 Quickbird image3) More GCP’s than necessary were gathered and invalid ones discarded after acquiring and analysing the Quickbird image. Sufficient GCP’s are now available.4) A replacement level 1B image was subsequently obtained, allowing the best possible orthorectification.5) Accuracy was somewhat improved by using the free 30m SRTM DEM but there remains room for improvement. Free stereo aerial imagery has been requested from NGI for the purpose of constructing a high resolution, high accuracy DEM.6) Corner locations of 2005 CS GT plots have been requested. |

# SECTION B: IDENTIFIED RISKS AND SOLUTIONS

# Describe the identified risks to the project outputs

# *There are currently no risks to completing the initial carbon stock remote sensing feasibility study this year as planned. However:*

# *The poor accuracy of the Digital Elevation Model (DEM) degrades the accuracy of the satellite image orthorectification. This in turn will likely negatively affect carbon stock regression accuracy.*

# *The lack of precise corner co-ordinates for the 2005 carbon stock ground truth plots means that there is uncertainty in the location of these plots in the satellite image. This uncertainty will likely have a negative impact on the accuracy of the feasibility study carbon stock regression.*

# Describe possible solutions to identified risks

# *Construct a high accuracy DEM using stereo aerial imagery from National Geo-spatial Information (NGI). (This imagery has now been requested.) Alternatively, use the free 30m SRTM DEM which does improve on the existing DEM.*

# *The corner co-ordinates have been requested.*

# SECTION C: SUMMARY OF LESSONS LEARNT DURING THE REPORTING QUARTER

# *Achieving adequate geometric accuracy for plot location in rugged terrain is challenging and likely requires both a high resolution DEM and a set of sub-meter accuracy GCP’s for orthorectification.*

# *Larger carbon stock plot size helps decrease sensitivity to geolocation errors and reduces variation amongst plots.*

# SECTION D: BUDGET TRACKING

# Please note that you will be required to submit a financial report at the end of 2017 (Before December) detailing your expenditure for the year. This requires that you keep a record of all invoices and receipts relating to project expenditure. The format for the report will be sent closer to the time.

**SECTION E: APPENDICES**

**APPENDIX 1:** *e.g. Minutes of expert workshop held on planting protocols (include one or two photographs and an attendance register if possible)*

**APPENDIX 2:** *e.g. Raw carbon baseline data collected for 50 ha on communal farms in Baviaanskloof (include map of where data was collected)*

**APPENDIX 3:** *Photos, maps anything to justify or prove your activities and expenditure.*

**APPENDIX 4**