Fiji FRL changes

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This relates to

Item 2 – MAIB above and below ground distribution

Item 3 – Burned area data and filling gaps

Item 4 – Legacy issues in Afforestation in the FRL

Item 5 – Inconsistencies with documentation and R code relating to Fire

Item 6 – Specific detail on technical corrections on the FRL

Item 7 – Monte Carlo documentation

# Item 2 – MAIB above and below ground distribution

## MAIB root to shoot ratio Fire

File:

* FijiNFMSCalculations/Burning.R

CalcEstEmFire <- function(Age,

MAIBsw, # Mean Annual Increment Biomass softwood

RootToShootDryLandSmall,

Area) {

# Estimate AGB

AGB <- Age \* (MAIBsw / (1 + RootToShootDryLandSmall))

This code is incorrect as MAIBsw is above ground and below ground

# Mean annual (total) biomass increment in Softwood Plantations (Waterloo, 1994)

# Mean annual increment (total tree biomass, i.e., AGB + BGB). Table 11.19 in

# Waterloo (1994)

FRLParams$maibp <- 10 # Mean annual biomass increment in Softwood Plantations

This effects both the FRL and MR. Need to be recalculated.

# Item 6 – Specific detail on technical corrections on the FRL

## Key Dates:

* 14 June 2019 – FRL updated
  + Original data from published FRL values in the ER-PD
* 24 May 2021 – First check into Github
* 18 Nov 2021 – First check into SVN
  + This is the start of this instance of the File server (SVN) there is an older archive that has the original
* 25 Sep 2021 – FRL updated – **[Carly: Tech 2 – Data improvement related to Softwood plantation]**
  + Update included changes for: Softwood harvesting
  + correction to the Upland/Lowland boundary from 400m to 600m
* 30 Sep 2021 – FRL updated
  + Update included changes to original FRL for Softwood harvesting only
* 14 Feb 2022 – FRL updated – **[Carly: Tech 1 –** **Data improvement related to Deforestation and Afforestation]**
  + Changes for RS data, pixel buffer and other method changes
  + added fix to allow more mapped classes than reference classes
* 18 Nov 2022 – FRL updated – **[Carly: Tech 3 – Increase scope of Forest Deg]**
  + added Natural Forest Degradation
* 13 Jan 2023 – FRL updated
  + FRL growth tables check in to repo FijiNFMSIntegration
* 23 Oct 2023 – FRL updated
  + added new report and corrected integration of non proxy calcs
* Sep 2021 - swCorrection
* Sep 2021 - preMonitoringReport
* Sep 2021 - frlCorrection
* Jan 2022 - frlUpdateJan22
* Feb 2022 - frlUpdate14Feb22
* Oct 2022 - frlUpdateOct22
* Oct 2023 - frlUpdateOct23

## Tech correction 1 - Data improvements related to Deforestation and Afforestation

### Code changes

Diff file:

* Tech-1-diff.pdf

## Tech correction 2 - Data improvement related to Softwood plantation

### Code changes

Diff file:

* Tech-2-diff.pdf

## Tech correction 3 - Increase scope of Forest Degradation

### Code changes

Diff file:

* Tech-3-diff.pdf

## Post Tech 1,2, and 3 FRL numbers

The FRL numbers post the changes can be found in the FRL report.

File:

* Fiji\_FRL\_Report-Oct23.html

# Item 7 – Monte Carlo documentation

## Requests for MR monte carlo notes

File:

* fcpf\_guidance\_on\_monte\_carlo\_analysis\_2021.pdf
* Uncertainty\_Technical Corrections\_MR.pdf

# Request for a yearly account of MR

Analysis Files:

* Fiji\_ER\_MonitoringReportExtraTables-2019-Dec23.html
* Fiji\_ER\_MonitoringReportExtraTables-2020-Dec23.html

Issue identified with hard coded values in, the age in years is currently reversed:

age\_yrs = c(0.5,1.5)

The line of code above needs to be changed to: (The first year grows for 1.5 years and the second year only grows for 0.5 years in the MR)

age\_yrs = c(1.5,0.5)

This affects:

* calcER\_Estimate\_Values.R
* calcER\_Estimate\_UC.R
* calcER\_Estimate\_Sensitivity.R

The MR report will need to be rerun completely.

# Item 4 – Legacy issues in Afforestation in the FRL

## Legacy Emissions

Analysis Files:

* Fiji\_ER\_MonitoringReportExtraTables-Oct23.html
* Fiji\_ER\_Report-Oct23.html
* Fiji\_FRL\_Report-Oct23.html
* GrowthTable-Diff.pdf

# Item 3 – Burned area data and filling gaps

This sort of relates to the investigation on Item 5 – Inconsistencies with documentation and R code relating to Fire.

This was thought to only be the CO2e but there are other issues.

## Fire CO2e calculations

### MR Code

MR is CO2e, but incorrect BGB. BGB should not burn. See the FRL.

# CO2 ABG emissions

EmCO2AGB <- Area \* AGB \* CombustFactor \* GWPCO2 \* EFCO2 \* 0.001

# CO2 BGB emissions

EmCO2BGB <- Area \* BGB \* CombustFactor \* GWPCO2 \* EFCO2 \* 0.001

> CombustFactor

[1] 0.46

> GWPCO2

[1] 1

> EFCO2

[1] 1580

### FRL Code

BGB is wrong it applies the CF, bioburn\_ghgs[1, 2], when it should not. The rest of the BGB is right.

AGB is correct.

# Emissions (in tCO2e) for each gas (and each compartment)

# CO\_2 (above-ground biomass)

sw\_barea$co2agb <- sw\_barea$area\_ha \* sw\_barea$agb \* bioburn\_ghgs[1, 2] \*

bioburn\_ghgs[1, 3] \* bioburn\_ghgs[1, 4] \* 0.001

# CO\_2 (below-ground biomass)

sw\_barea$co2bgb <- sw\_barea$area\_ha \* sw\_barea$bgb \* FRLParams$etacf \*

FRLParams$etacc \* bioburn\_ghgs[1, 2]

> bioburn\_ghgs[1, 2]

[1] 0.46

> FRLParams$etacc

[1] 3.666667

> FRLParams$etacf

[1] 0.47

> bioburn\_ghgs[1, 2]

[1] 0.46

> bioburn\_ghgs[1, 3]

[1] 1580

> bioburn\_ghgs[1, 4]

[1] 1

Files:

* CalcFRLBurning.R
* Burning.R

# Audit report CAR’s

## MCAR 14 - Wednesday

Carly to map names and identify UC for parameters based on table in section 5.2.1

## MCAR 15- Wednesday

Same as above for Activity data and Monitored Values

## MCAR 20

Public availability of excel spreadsheet. This is not required as it was provided to the auditor and that is all required.

This will not be acted on unless directed by Fiji Gov. to do so. The solution would be to just make the github public.

No code change

Provide Carly the link.

## MCAR 40

Fire calcs Above and below ground in MR and FRL

In code and documentation

## MCAR 43

Check code and documentation are consistent - HWPharvest

No R code changes

## MCAR 44

Check code and documentation are consistent – HWP replanting

No R code changes

## MCAR 45

Check code and documentation are consistent – SWP harvesting

No R code changes

## MCAR 57- Wednesday

Check code and documentation are consistent - FPlnAreaPlantHwd

Plantation Area data FPlnAreaPlantHwd, has UC been applied and is it the same in the FRL? Check this for Swd.

Change the 0.5,1.5 to 1.5,0.5 for growth years

## MCAR 61

Check fire between FRL, MR and code and documentation

No code change.

## mCAR 62

Allow the code to used in another monitoring report.