

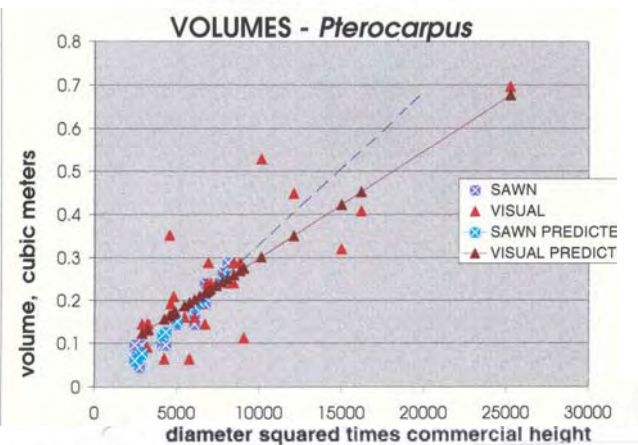
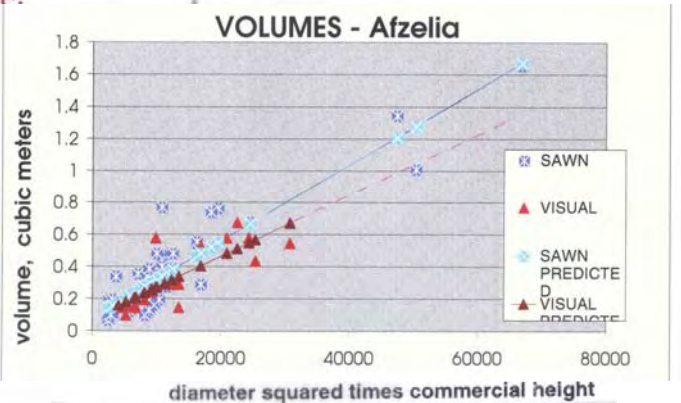
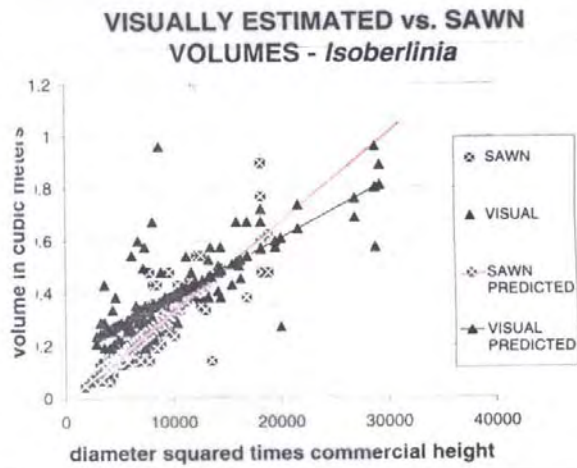
# UTILIZATION OF HUMAN EXPERIENCE IN LIEU OF RAW STATISTICS IN TREE VOLUME PREDICTIONS

Cecilia Polansky  
Grad student at University of Vermont

**Q:** CAN EXPERIENCED SAWYERS' ESTIMATES ELIMINATE THE NEED FOR COSTLY DESTRUCTIVE SAMPLING FOR VOLUME TABLES ON SHORT-TERM, LIMITED-BUDGET PROJECTS IN DEVELOPING COUNTRIES?

**A:** SOMETIMES – IF YOU CAN ACCEPT THE FOLLOWING PROBABILITIES OF RESULTS FOR THESE THREE WEST AFRICAN SPECIES:

*Isoberlinia*:  $.001 < p < .005$   
*Afzelia*:  $.25 < p < .10$   
*Pterocarpus*:  $p > .25$



ARE THESE LINES DIFFERENT?

TEST for significance of interaction between volume determination method (sawn or visual) and the volume predictor (independent variable):

**H<sub>0</sub>:** It makes no difference whether you predict volume by experienced eye or by volume table based on sawn wood.

## ADVANTAGES TO USING A SAWYER TO ESTIMATE VOLUMES:

- INCORPORATES VILLAGERS INTO MANAGEMENT AND INVENTORY ACTIVITIES
- INCREASES IMPORTANCE OF VILLAGER ROLE IN FOREST MANAGEMENT
- LOW-TECH ESTIMATION MEANS MINIMUM TIME AND MONEY REQUIRED

## PROCEDURE:

(1) **SELECT** tree data from randomized lists within a diameter range common to both visually estimated and sawn volumes.

(2) **VERIFY** strong linear relationship between volume and the "visual" independent variable which predicts it:

Pearson's correlation coefficient between volume in cubic meters and potential predictors:

SPECIES	diameter r squared	square root d <sup>2</sup> hcomm	diam <sup>2</sup> x commercial height (d <sup>2</sup> hcomm)	log of d <sup>2</sup> hcomm	n
<i>Isoberlinia</i> - sawn	.74	.83	.83	.80	84
- visual	.54	.71	.72	.69	84
<i>Azelia</i> - sawn	.80	.91	.92	.83	57
- visual	.74	.83	.81	.83	23
<i>Pterocarpus</i> - sawn	.78	.91	.93	.88	14
- visual	.68	.81	.82	.77	31

(3) **CREATE** the interaction variable (determination method dm x d<sup>2</sup>hcomm) and run the FULL (WITH interaction variable) and REDUCED (without it) linear regression models:

**FULL:** Volume = d<sup>2</sup>hcomm + volume determination method **dm** + (d<sup>2</sup>hcomm x **dm**)

**REDUCED:** Volume = d<sup>2</sup>hcomm + volume determination method **dm**

(4) IF  $F_s = \frac{SSE_{REDUCED} - SSE_{FULL}}{MSE_{FULL}} > F_{TABLE(\alpha, 1, DF \text{ of } MSE_{FULL})}$ , THEN

**REJECT** equality of lines and assume that sawyer's estimates are too uncertain to replace a destructive sample.

## RESULTS:

	df of MSE <sub>full</sub>	F <sub>s</sub>	F(.05, 1, dfMSE)	Use sawyer estimates?
<i>Isoberlinia</i>	162	10.5	3.9	iffy
<i>Azelia</i>	76	1.8	4.0	sure
<i>Pterocarpus</i>	41	1.0	4.1	sure

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**A:** *SOMETIMES – IF YOU CAN ACCEPT THE FOLLOWING PROBABILITIES OF RESULTS FOR THESE THREE WEST AFRICAN SPECIES:*

*Isoberlinia:* .001 < p < .005 (debatable)  
*Azelia:* .25 < p < .10 (probably)  
*Pterocarpus:* p > .25 (yes)