Land-Mix Analysis Formula

If interested in how DataLog calculates values for the Land-Mix Analysis, here is a simplified example of an **unimproved sale**, where the user input the land uses, their ratios, the number of acres for each use, and the CEV price (equal to the Sales Price here). Last, the user clicked the Calculate Land Values button and the #/Acre and Total Unit Value columns in the grid automatically populated with the numbers shown:

Grantor		Sales Price	4,000	A	Property Type	
Grantee		Other Contrib.		B	Primary Land Use	
Deeded Acres	21	Net Sale Price	4,000	C		
Sale Date/DOM	/	$/Deeded Acre	190.48	D		
Prior Sale Date		Financing		E		
Prior CEV Price		% Fin. Adj.		F		
Analysis Code		CEV Price	4,000	G		
Source		SCA Unit Type		H		

Land-Mix Analysis

Select Land List ▼   Calculate Land Values   Unimproved Database Index

Land Use	Ratios	Acres	$/Acre	Unit Size	Unit Type	$/Unit	Total Unit Value
Dry Crop A	100	8	204.08				1,633
Dry Crop B	120	5	244.90				1,225
Pasture	70	8	142.86				1,143

| Totals | | 21 | 190.48 | | | | 4,001 |

CEV Price $ 4,000 - Land Contribution $ 4,001 = Improvement Contribution $ -1

How does DataLog determine the $/Acre values for each of the land rows?
In the explanation below, X represents the unknown $/Acre value for the first row, the value that serves as the base from which the remaining values are derived. This is the reason the first row ratio must always be 100.

Given: The CEV Price is $4000; the ratios are 100, 120, and 70 for the land types; the acreages are 8, 5, and 8 respectively. Therefore:

$$8(100\%x) + 5(120\%x) + 8(70\%x) = \$4000$$

$$8x + 5(1.2x) + 8(0.7x) = \$4000$$

$$8x + 6x + 5.6x = \$4000$$

$$19.6x = \$4000$$

$$x = \$204.08 \quad \text{therefore } 1.2x = \$244.90 \quad \text{and} \quad 0.7x = \$142.86$$

DataLog will also auto-calculate the average *bare ground* $/Acre value ($190.48 in the example) and show correctly that there is essentially zero remaining for an Improvement Contribution. The $1 difference is due to rounding and is not significant in terms of the analysis.

For an **improved sale** the sale must be identified as improved in order for these calculations to work. This is done at the top of the sale sheet.

Then, for explanation purposes we have the following information:
The CEV price is $375,000, with the following land types and ratios:

Land-Mix Analysis

Select Land List ▾ | Calculate Land Values

Land Use	Ratios	Acres
D Crop A	100	410
D Crop B	80	40
Meadow/Hay	70	70
Pasture A	50	35
Pasture B	40	35
Roads/Waste	0	0

The appraiser must enter the number of acres for each land type, AND the $/acre value for the first land type so the program has a value to start with. For this example, that value is $569.99.

Land-Mix Analysis

Select Land List ▾ | Calculate Land Values

Land Use	Ratios	Acres	$/Acre
D Crop A	100	410	569.99
D Crop B	80	40	
Meadow/Hay	70	70	
Pasture A	50	35	
Pasture B	40	35	
Roads/Waste	0	0	

The ratios are 100, 80, 70, 50, and 40 for the land types; the acreages are 410, 40, 70 , 35, and 35 respectively. Therefore the Land Mix values are determined this way:

$$410(569.99) + 40(0.8 \times 569.99) + 70(0.7 \times 569.99) + 35(0.5 \times 569.99) + 35(0.4 \times 569.99) = ?$$

Click the Calculate Land Values button to see the numbers:

Land-Mix Analysis

Select Land List ▾ | Calculate Land Values | | | | Unimproved Database Index | | 1 |

Land Use	Ratios	Acres	$/Acre	Unit Size	Unit Type	$/Unit	Total Unit Value
D Crop A	100	410	569.99				233,696
D Crop B	80	40	455.99				18,240
Meadow/Hay	70	70	398.99				27,929
Pasture A	50	35	285.00				9,975
Pasture B	40	35	228.00				7,980
Roads/Waste	0	0	0.00				0

So the complete Land-Mix grid looks like this:

Land-Mix Analysis

Select Land List ▾ | Calculate Land Values | | | | Unimproved Database Index | | 1 |

Land Use	Ratios	Acres	$/Acre	Unit Size	Unit Type	$/Unit	Total Unit Value
D Crop A	100	410	569.99				233,696
D Crop B	80	40	455.99				18,240
Meadow/Hay	70	70	398.99				27,929
Pasture A	50	35	285.00				9,975
Pasture B	40	35	228.00				7,980
Roads/Waste	0	0	0.00				0
Totals		590	504.78				297,820

CEV Price $ 373,500 - Land Contribution $ 297,820 = Improvement Contribution $ 75,680

The total for the Land Contribution is $297,820, with $75,680 remaining for the Improvement Contribution.