

Package ‘IndFarmCost’

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Type Package

Title Indian Farm Cost Concepts for Agricultural Economic Analysis

Version 0.1.0

Description Implements commonly used Indian farm cost concepts for agricultural economic analysis, including Cost A1, A2, B1, B2, C1, C2, and C3. Tools are provided to calculate cost concepts from farm-level input data, aggregate costs across groups, summarize distributions, compute returns and benefit-cost ratios, estimate cost of production and break-even values, decompose cost shares, conduct one-way sensitivity analysis, and visualize concept-wise costs. The implementation is designed for reproducible farm management and cost-of-cultivation studies.

License GPL-3

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a2_plus_fl	<i>A2 Plus Family Labour</i>
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Description

Calculates the frequently reported A2 plus family labour measure from a farmcost object.

Usage

a2_plus_fl(x)

Arguments

x An object returned by [farm_costs\(\)](#).

Value

A numeric vector equal to A2 plus imputed family labour.

break_even_price	<i>Break-Even Price</i>
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Description

Calculates the main-product price required to cover a selected cost concept, after crediting by-product value.

Usage

break_even_price(x, yield, concept = "C2", byproduct_value = 0)

Arguments

x	An object returned by farm_costs() .
yield	Main-product yield as a column name, scalar, or vector.
concept	Cost concept used for break-even analysis.
byproduct_value	By-product value credited against cost.

Value

A numeric vector of break-even prices.

break_even_yield	<i>Break-Even Yield</i>
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Description

Calculates the main-product yield required to cover a selected cost concept, after crediting by-product value, at a specified product price.

Usage

```
break_even_yield(x, price, concept = "C2", byproduct_value = 0)
```

Arguments

x	An object returned by farm_costs() .
price	Main-product price as a column name, scalar, or vector.
concept	Cost concept used for break-even analysis.
byproduct_value	By-product value credited against cost.

Value

A numeric vector of break-even yields.

concept_definitions	<i>Indian Farm Cost Concept Definitions</i>
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Description

Provides a compact table describing the cost concepts implemented by the package.

Usage

```
concept_definitions()
```

Value

A data frame with concept, formula, and interpretation.

cost_of_production	<i>Cost of Production per Unit</i>
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Description

Calculates unit cost as the selected cost concept less by-product value, divided by main-product yield.

Usage

```
cost_of_production(x, yield, concept = "C2", byproduct_value = 0)
```

Arguments

x	An object returned by farm_costs() .
yield	Main-product yield as a column name, scalar, or vector.
concept	Cost concept used in the numerator. One of A1, A2, B1, B2, C1, C2, or C3.
byproduct_value	By-product value as a column name, scalar, or vector. Defaults to zero.

Value

A numeric vector of cost per unit of main product.

cost_sensitivity	<i>One-Way Farm Cost Sensitivity Analysis</i>
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Description

Changes one raw cost input by a series of proportional changes and reports the mean A1 through C3 under each scenario.

Usage

```
cost_sensitivity(data, variable, changes = c(-0.2, -0.1, 0, 0.1, 0.2), ...)
```

Arguments

data	Raw input data frame accepted by <code>farm_costs()</code> .
variable	Name of one numeric input column to vary.
changes	Numeric vector of proportional changes. For example, <code>0.10</code> means a 10 percent increase and <code>-0.10</code> a 10 percent decrease.
...	Additional arguments passed to <code>farm_costs()</code> .

Value

A data frame with the scenario change and mean cost concepts.

cost_shares	<i>Decompose Farm Costs into Additive Shares</i>
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Description

Decomposes C2 or C3 into the A1 base, leased-land rent, interest on owned fixed capital, rental value of owned land, family labour, and (for C3) managerial cost.

Usage

```
cost_shares(x, denominator = c("C3", "C2"))
```

Arguments

x	An object returned by <code>farm_costs()</code> with the original input columns retained.
denominator	Either "C2" or "C3".

Value

A long data frame with row number, component, amount, denominator, and share percentage.

farm_costs

*Calculate Indian Farm Cost Concepts A1 to C3***Description**

Calculates Cost A1, A2, B1, B2, C1, C2, and C3 for each row of a farm-level data frame.

Usage

```
farm_costs(
  data,
  a1_cols = standard_a1_components(),
  a1_col = NULL,
  rent_leased_land = "rent_leased_land",
  interest_fixed_capital = "interest_fixed_capital",
  rental_value_owned_land = "rental_value_owned_land",
  family_labour = "family_labour",
  managerial_rate = 0.1,
  na.rm = FALSE,
  keep_inputs = TRUE
)
```

Arguments

data	A data frame containing farm cost components.
a1_cols	Character vector naming columns to sum for Cost A1. By default, standard_a1_components() is used.
a1_col	Optional name of a pre-computed A1 column. If supplied, a1_cols is ignored.
rent_leased_land	Column name, scalar, or numeric vector for rent paid for leased-in land.
interest_fixed_capital	Column name, scalar, or numeric vector for interest on owned fixed capital excluding land.
rental_value_owned_land	Column name, scalar, or numeric vector for the imputed rental value of owned land.
family_labour	Column name, scalar, or numeric vector for the imputed value of family labour.
managerial_rate	Non-negative managerial charge rate used for C3. The default is 0.10, so C3 equals 110 percent of C2.
na.rm	Logical. If TRUE, missing A1 components are ignored when A1 is summed. Missing values in the additional cost components still propagate.
keep_inputs	Logical. If TRUE, retain the input columns in the result.

Value

An object of class `farmcost` and `data.frame` containing the seven cost concepts.

`farm_costs_aggregate` *Aggregate Farm Cost Concepts by Groups*

Description

Aggregates A1 through C3 by one or more grouping variables using the mean, median, or sum. Weighted means are supported.

Usage

```
farm_costs_aggregate(  
  x,  
  by,  
  method = c("mean", "median", "sum"),  
  weights = NULL,  
  na.rm = TRUE  
)
```

Arguments

<code>x</code>	An object returned by <code>farm_costs()</code> . Grouping columns must be retained in <code>x</code> .
<code>by</code>	Character vector naming grouping columns.
<code>method</code>	One of "mean", "median", or "sum".
<code>weights</code>	Optional column name or numeric vector of non-negative weights. Weights are allowed only when <code>method = "mean"</code> .
<code>na.rm</code>	Logical indicating whether missing values should be removed.

Value

A data frame with grouping columns and aggregated A1 through C3.

farm_cost_example	<i>Example Indian Farm Cost Data</i>
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Description

Returns a small deterministic farm-level dataset suitable for examples, teaching, and testing. Monetary values are illustrative Indian rupees per hectare and do not represent an official survey.

Usage

```
farm_cost_example()
```

Value

A data frame with 12 farm observations and standard cost components.

farm_returns	<i>Compute Farm Returns and Benefit-Cost Ratios</i>
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Description

Computes gross return, net return over each cost concept, and gross-return to cost ratios. Gross return may be supplied directly or calculated from main and by-product quantities and prices.

Usage

```
farm_returns(  
  x,  
  gross_return = NULL,  
  main_output = NULL,  
  main_price = NULL,  
  byproduct_output = NULL,  
  byproduct_price = NULL  
)
```

Arguments

- x An object returned by [farm_costs\(\)](#).
- gross_return Optional gross return as a column name, scalar, or vector.
- main_output, main_price Main-product quantity and price, each supplied as a column name, scalar, or vector.
- byproduct_output, byproduct_price Optional by-product quantity and price. If omitted, by-product value is treated as zero.

Value

A data frame containing gross return, net returns, and benefit-cost ratios for A1 through C3.

plot.farmcost	<i>Plot Indian Farm Cost Concepts</i>
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Description

Plots A1 through C3 for one observation or the column means across all observations.

Usage

```
## S3 method for class 'farmcost'
plot(x, row = 1L, type = c("bar", "line"), main = NULL, ylab = "Cost", ...)
```

Arguments

x	An object returned by farm_costs() .
row	Row number to plot. Use NULL to plot means across observations.
type	Either "bar" or "line".
main	Plot title.
ylab	Y-axis label.
...	Additional graphical arguments passed to graphics::barplot() or graphics::plot() .

Value

The plotted values, invisibly.

print.farmcost	<i>Print a Farm Cost Object</i>
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Description

Print a Farm Cost Object

Usage

```
## S3 method for class 'farmcost'
print(x, ...)
```

Arguments

x	An object returned by farm_costs() .
...	Arguments passed to print.data.frame() .

Value

The input object, invisibly.

standard_a1_components	<i>Standard A1 Cost Components</i>
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Description

Returns the default column names used by `farm_costs()` to construct Cost A1.

Usage

```
standard_a1_components()
```

Value

A character vector of standard A1 component names.

summarize_costs	<i>Summarize Farm Cost Concepts</i>
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Description

Computes descriptive statistics for A1 through C3.

Usage

```
summarize_costs(x, na.rm = TRUE)
```

```
## S3 method for class 'farmcost'  
summary(object, ...)
```

Arguments

- `x` An object returned by `farm_costs()`.
- `na.rm` Logical indicating whether missing values should be removed.
- `object` An object returned by `farm_costs()`.
- `...` Additional arguments passed to `summarize_costs()`.

Value

A data frame with sample size, mean, standard deviation, minimum, quartiles, maximum, and coefficient of variation.
A data frame of descriptive statistics.

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