Package: mrcommons (via r-universe)

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Type Package

Title MadRat commons Input Data Library

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Description Provides useful functions and a common structure to all the input data required to run models like MAgPIE and REMIND of model input data.

Depends R (>= 2.10.0), magclass (>= 3.17), madrat (>= 2.20.9), mrdrivers (>= 1.0.0), mrfaocore (>= 1.0.0), mrlandcore (>= 1.0.0), mstools (>= 0.6.0)

Imports data.table, dplyr, hdf5r, GDPuc, luscale, magpiesets (>= 0.44.2), ncdf4, openxlsx, purrr, quitte, raster, terra, readxl, reshape2, rlang, stringr, tidyr, tibble, withr, zoo, methods, countrycode

Suggests covr, HARr, knitr, lifecycle, rmarkdown, testthat, XML

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BugReports https://github.com/pik-piam/mrcommons/issues

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VignetteBuilder knitr

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Repository https://pik-piam.r-universe.dev

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RemoteRef HEAD

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Contents

`calc1stBioDem` *calc1stBioDem*

Description

Calculates projections of first generation biofuels demand,including biogas, bioethamol and biodiesel, from IEA database. The unit is Petajoule.

Usage

```
calc1stBioDem(subtype = "all")
```

Arguments

subtype	all per default. ethanol_oils for selecting 1st gen crop types relevant for REMIND input.

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Xiaoxi Wang, David Klein

See Also

calc1stBioenergyPast()

Examples

```
## Not run:
calcOutput("1stBioDem")

## End(Not run)
```

---

calc1stBioenergyPast *calc1stBioenergyPast*

Description

Calculates first generation biofuels production, imports, exports for biogas, bioethanol and biodiesel from IEA database. The unit is Petajoule.

Usage

```
calc1stBioenergyPast()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Xiaoxi Wang, Isabelle Weindl

Examples

```
## Not run:
calcOutput("1stBioenergyPast")

## End(Not run)
```

calcACCMIP *calcACCMIP*

Description

reads in the ACCMIP atmospheric deposition database. Speeds up caching

Usage

```
calcACCMIP(glo_incl_oceans = FALSE)
```

Arguments

glo_incl_oceans	if true, a global value will be returned that also includes deposition on oceans and should be equivalent to total emissions.

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcAtmosphericDeposition()

Examples

```
## Not run:
calcOutput("ACCMIP")

## End(Not run)
```

calcAdjustGrassi2021 *calcAdjustGrassi2021*

Description

Calculates the carbon emission adjustement factors as derived by Grassi et al. 2021 Adjustement factors are provided in GtCO2 yr-1. Positive and negative values possible.

Usage

```
calcAdjustGrassi2021()
```

Value

magpie object with emission adjustement factors weighted by country C removals 2000 to 2015.

Author(s)

Michael Windisch, Florian Humpenoeder

Examples

```
## Not run:
calcOutput("AdjustGrassi2021")

## End(Not run)
```

---

calcAgProductionValue *calcAgProductionValue*

Description

Calculate FAO Value Of Production

Usage

```
calcAgProductionValue(datasource = "FAO")
```

Arguments

datasource	Currently available: "FAO"

Value

FAO Value Of Production as a list of MAgPIE objects

Author(s)

Roman Popov, Mishko Stevanovic, Patrick v. Jeetze

See Also

calcOutput(), readFAO(), convertFAO(), readSource()

Examples

```
## Not run:
a <- calcOutput("AgProductionValue", datasource = "FAO")

## End(Not run)
```

calcAnimalStocks *calcAnimalStocks*

Description

calculates stocks of animals of different categories.

Usage

```
calcAnimalStocks(grouping = "IPCC")
```

Arguments

grouping	IPCC: Animal grouping of IPCC Guidelines

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcExcretionIPCC(), readIPCC()

Examples

```
## Not run:
calcOutput("AnimalStocks")

## End(Not run)
```

calcAtmosphericDeposition *calcAtmosphericDeposition*

Description

Computes Atmospheric (nitrogen) deposition on different land-use types. It distinguishes ammonia (Nh3) and Nitrogen oxides (NOx) as well

Usage

```
calcAtmosphericDeposition(
  datasource = "ACCMIP",
  glo_incl_oceans = FALSE,
  cellular = FALSE,
  cells = "lpjcell",
  emission = FALSE,
  scenario = NULL
)
```

Arguments

datasource	deposition inventory
glo_incl_oceans	provides global values that include oceans, as oceans are not part of the country mapping
cellular	cellular or country level emissions
cells	magpiecell (59199 cells) or lpjcell (67420 cells)
emission	if TRUE, not the deposition but the cellular emissions are reported
scenario	if dataset contains several scenarios (e.g. ACCMIP), one scenario can be selected.

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcNitrogenBudgetCropland()

Examples

```
## Not run:
calcOutput("AtmosphericDeposition")

## End(Not run)
```

calcAtmosphericRedepositionShare
calcAtmosphericRedepositionShare

Description

Calculates share of volatilised nitrogen emissions that is redeposited on different land types.

Usage

```
calcAtmosphericRedepositionShare(
  cellular = FALSE,
  maxshare = 0.8,
  scenario = "rcp45"
)
```

Arguments

cellular	cellular or country level
maxshare	the maximum amount of emissions deposited within the same cell or country. The remainder will be handled as global emission
scenario	scenario

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("AtmosphericRedepositionShare")

## End(Not run)
```

calcAtmosphericTransboundaryRedepositionShare *calcAtmosphericRedepositionShare*

Description

Calculates share of volatilised nitrogen emissions that is redeposited on different land types.

Usage

```
calcAtmosphericTransboundaryRedepositionShare(
  maxshare = 0.8,
  scenario = "rcp45"
)
```

Arguments

maxshare	the maximum amount of emissions deposited within the same cell or country. The remainder will be handled as global emission
scenario	scenario

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("AtmosphericRedepositionShare")

## End(Not run)
```

calcAWMSconfShr *calcAWMSconfShr*

Description

calculates the share of manure managed in different animal waste management systems in confinements. Starting with IPCC 2005 values, turning into scenarios for the future.

Usage

```
calcAWMSconfShr(rev = 0.1)
```

Arguments

rev	revision number of madrat run

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky. Modifications by Edna J. Molina Bacca

See Also

calcAWMSconfShrPast()

Examples

```
## Not run:
calcOutput("AWMSconfShr")

## End(Not run)
```

---

calcAWMSconfShrPast *calcAWMSconfShrPast*

Description

calculates the share of manure excreted in different types of animal waste management systems in confinements in the year 2005 using the IPCC Guidelines excretion rates.

Usage

```
calcAWMSconfShrPast(products = "magpie")
```

Arguments

products	IPCC: IPCC products. MAgPIE: Magpie products

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcAWMSconfShr(), calcExcretionIPCC()

Examples

```
## Not run:
calcOutput("AWMSconfShrPast")

## End(Not run)
```

---

calcBiomeType *calcBiomeType*

Description

Returns fraction of spatial unit (cell) belonging to a biome type of each biogeographic realm. The classification is based on data from 'the nature conservancy' (https://geospatial.tnc.org/datasets/b1636d640ede4d6ca8f5e369f originally developed by Olson et al. (2001), BioScience.

Usage

```
calcBiomeType(cells = "lpjcell")
```

Arguments

cells	magpiecell (59199 cells) or lpjcell (67420 cells)

Value

List with a magpie object

Author(s)

Patrick v. Jeetze

See Also

readTNC2019

Examples

```
## Not run:
calcOutput("BiomeType", aggregate = FALSE)

## End(Not run)
```

calcBioplasticToBiomass *calcBioplasticToBiomass*

Description

calculates conversion factors from bioplastic demand to demand of biomass needed for the production, taking into account the average share of different biomass sources (glycerol, starch, sugars, cellulose, oils) for bioplastic production and corresponding content in the different crop types

Usage

```
calcBioplasticToBiomass()
```

Value

List of magpie objects with global conversion factors, unit and description.

Author(s)

Debbora Leip

Examples

```
## Not run:
calcOutput("BioplasticToBiomass")

## End(Not run)
```

calcBodyHeight *calcBodyHeight*

Description

reads in the Lutz et al dataset. Aggregates the age structure. Population is divided by sex male (M) , female (F) and both (B) and divided by 8 age classes: 0-4, 5-9, 10-14, 15-19, AG1 (20-29), AG2 (30-59), AG3(60-79), AG4(80+)

Usage

```
calcBodyHeight(convert = TRUE)
```

Arguments

convert	if TRUE, the convertscript of Lutz et al is activated. Also,the year 1965 is extrapolatedusing the worldbank population data and sex, age, and education structure of 1970.

calcCentralFeedshares *calcCentralFeedshares*

Description

Calculates future central feed shares for all livestock categories based on the results of a non-linear regression between historical central feed shares and livestock productivity and using Koeppen-Geiger climate zones

Usage

```
calcCentralFeedshares()
```

Value

Central feed shares and weights as list of two MAgPIE-objects

Author(s)

Isabelle Weindl, Benjamin Bodirsky, Stephen Wirth, Jan Philipp Dietrich

Examples

```
## Not run:
calcOutput("CentralFeedshares")

## End(Not run)
```

calcClimateClass *calcClimateClass*

Description

fraction of a cell belonging to a given climate classification based on different climate cliassification schemes

Usage

```
calcClimateClass(datasource = "koeppen", cells = "magpiecell")
```

Arguments

datasource	select source from: - koeppen for Koeppen Geiger Classification http://koeppen-geiger.vu-wien.ac.at/ - ipcc, ipccReduced, ipccReduced2019 for IPCC Guideline climate classification
cells	"magpiecell" for 59199 cells or "lpjcell" for 67420 cells

Value

Clustered MAgPIE object on requested resolution

Author(s)

Abhijeet Mishra, Kristine Karstens

Examples

```
## Not run:
calcOutput("ClimateClass", aggregate = FALSE)

## End(Not run)
```

`calcClossConfinement` *calcClossConfinement*

Description

Carbon losses for livestock confinements

Usage

```
calcClossConfinement()
```

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Kristine Karstens

Examples

```
## Not run:
calcOutput("ClossConfinement")

## End(Not run)
```

calcConstructionWoodDemand *calcConstructionWoodDemand*

Description

Calculates the demand of construction wood from Galina et al. 2020 data. See

Usage

```
calcConstructionWoodDemand()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Abhijeet Mishra

See Also

calcFAOmassbalance_pre()

Examples

```
## Not run:
calcOutput("ConstructionWoodDemand")

## End(Not run)
```

calcDemography *calcDemography*

Description

reads in the Lutz et al dataset. Aggregates the age structure. Population is divided by sex male (M) , female (F) and both (B) and divided by 8 age classes: 0-4, 5-9, 10-14, 15-19, AG1 (20-29), AG2 (30-59), AG3(60-79), AG4(80+)

Usage

```
calcDemography(convert = TRUE, education = TRUE)
```

Arguments

convert	if TRUE, the convertscript of Lutz et al is activated. Also,the year 1965 is extrapolatedusing the worldbank population data and sex, age, and education structure of 1970.
education	if FALSE, no education dimension will be provided

---

calcDevelopmentState *calc*

Description

Provides development state of a country or region. We use worldbank definitions by default: above 12746 USD per capita, its a high-income country, below 1045 its a low-income country, in between its a medium-income country.

Usage

```
calcDevelopmentState(upper = 12746, lower = 1045)
```

Arguments

upper	Change upper limit (default: 12746)
lower	Change lower limit (default: 1045)

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky, Kristine Karstens

See Also

calcGDPpc()

Examples

```
## Not run:
calcOutput("DevelopmentState")

## End(Not run)
```

calcEDGAR6 *calcEDGAR6*

Description

Creates an emission inventory based on the EDGAR5 and EDGAR6 database.

Usage

```
calcEDGAR6(non_country = FALSE, nutrient = TRUE)
```

Arguments

non_country	can alternatively provide SEA and AIR emissions, which are global emissions that cannot be attributed to a country
nutrient	if TRUE, nitrogen is reported as N and CO2 as C

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

calcEF3confinement *calcEF3confinement*

Description

Emission factors for nitrogenous emissions in livestock confinements

Usage

```
calcEF3confinement(products = "magpie", selection = "n_pollutants_direct")
```

Arguments

products	Either livestock products in MAgPIE or IPCC products
selection	defaults to n_pollutants_direct

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("EF3confinement")

## End(Not run)
```

`calcEF3prp` *calcEF3prp*

Description

Returns emission factor for manure excreted during pasture range and paddock. Differs depending on the share of small ruminants.

Usage

```
calcEF3prp(select_years = "y2005")
```

Arguments

`select_years`	if only one year is selected, years is set to NULL

Value

list of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("EF3prp")

## End(Not run)
```

calcEmiMac *Calculate baseline emissions for maccs*

Description

Provides REMIND data for baseline emissions for maccs.

Usage

```
calcEmiMac()
```

Value

REMIND data for baseline emissions for maccs and corresonding weights (NULL) as a list of two MAgPIE objects

Author(s)

Lavinia Baumstark

See Also

calcOutput(), readSource()

Examples

```
## Not run:
calcOutput("calcEmiMac")

## End(Not run)
```

calcEmisNitrogenAWMSPast *calcEmisNitrogenAWMSPast*

Description

calculates nitrogenous emissions from animal waste management systems in the historical period

Usage

```
calcEmisNitrogenAWMSPast()
```

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("EmisNitrogenAWMSPast")

## End(Not run)
```

`calcEmisNitrogenCroplandPast`
calcEmisNitrogenCroplandPast

Description

calculates nitrogenous emissions from croplands in the historical period.

Usage

```
calcEmisNitrogenCroplandPast(method = "IPCC")
```

Arguments

`method`	IPCC: emissions are calculated according the the IPCC 2006 National Guidelines for Greenhouse Gas Inventories. Nsurplus: Emissions in 2005 are calculated according to IPCC, and the scaled with nitrogen losses from croplands.

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("EmisNitrogenCroplandPast")

## End(Not run)
```

calcEmisNitrogenNonaglandPast *calcEmisNitrogenNonaglandPast*

Description

Calculates nitrogenous emissions from non-agricultural land for the historical period

Usage

```
calcEmisNitrogenNonaglandPast(method = "Nsurplus")
```

Arguments

method	Method for calculating Atmospheric deposition: Nsurplus2 and Nsurplus are based on deposition rates based on own emission calculations after 2 or after 1 iteration, respectively.

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcEmisNitrogenPast(), calcExcretion()

Examples

```
## Not run:
calcOutput("EmisNitrogenPasturePast")

## End(Not run)
```

calcEmisNitrogenOceans *calcEmisNitrogenOceans*

Description

Conputes (nitrogen) emissions of Oceans.

Usage

```
calcEmisNitrogenOceans(method = "ACCMIP")
```

Arguments

method	deposition inventory

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcAtmosphericDeposition(), calcNitrogenBudgetCropland()

Examples

```
## Not run:
calcOutput("EmisNitrogenOceans")

## End(Not run)
```

calcEmisNitrogenPast *calcEmisNitrogenPast*

Description

Calculates nitrogenous emissions from all emission sources for the historical period. Complements own estimates with Edgar esimtates for the historical period.

Usage

```
calcEmisNitrogenPast(method = "IPCC")
```

Arguments

method	IPCC: emissions are calculated according the the IPCC 2006 National Guidelines for Greenhouse Gas Inventories. Nsurplus: Emissions in 2005 are calculated according to IPCC, and the scaled with nitrogen losses from croplands.

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("EmisNitrogenPast")

## End(Not run)
```

---

calcEmisNitrogenPasturePast

calcEmisNitrogenPasturePast

Description

Calculates nitrogenous emissions from pastures for the historical period

Usage

```
calcEmisNitrogenPasturePast(method = "IPCC")
```

Arguments

method	IPCC: emissions are calculated according the the IPCC 2006 National Guidelines for Greenhouse Gas Inventories. Nsurplus: Emissions in 2005 are calculated according to IPCC, and the scaled with nitrogen losses from croplands.

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcEmisNitrogenPast(), calcExcretion()

Examples

```
## Not run:
calcOutput("EmisNitrogenPasturePast")

## End(Not run)
```

---

calcEmisNitrogenPreagriculture

calcEmisNitrogenPreagriculture

Description

Calculates nitrogenous emissions Nitrogen emissions from soils under 100% natural cover (even for crop and urban) assuming a pre-agricultural time.

Usage

```
calcEmisNitrogenPreagriculture(cellular = FALSE, deposition = TRUE)
```

Arguments

cellular	cellular or country outputs
deposition	if TRUE, losses include atmospheric deposition inputs that are lost afterwards. If false, only biological fixation is considered.

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcEmisNitrogenPast(), calcExcretion()

Examples

```
## Not run:
calcOutput("EmisNitrogenPreagriculture")

## End(Not run)
```

calcEmisNitrogenWater *calcEmisNitrogenWater*

Description

Calculates Nitrogen Budgets for surface Water on country levels.

Usage

```
calcEmisNitrogenWater(method = "Nsurplus")
```

Arguments

method	method for calculating no3_n in groundwater

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("EmisNitrogenWater")

## End(Not run)
```

calcEmissionInventory *calcEmisNitrogenCroplandPast*

Description

provideees an emission inventory for the past, either from external data or own estimates.

Usage

```
calcEmissionInventory(
  datasource = "CEDS",
  targetResolution = "sectoral",
  from = "CEDS59",
  to = "Sectors"
)
```

Arguments

datasource	The Inventory that shall be used. Options are CEDS, combined_CEDS_IPCC (including own estimates where available), IPCC(own estimates), Nsurplus (own estimates)
targetResolution	Specific mapping file to be used.
from	column in mapping
to	column in mapping

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky, Michael S. Crawford

Examples

```
## Not run:
calcOutput("EmisNitrogenCroplandPast")

## End(Not run)
```

---

calcExcretion *calcExcretion*

Description

calculates excretion during grazing, cropland-grazing, confinement and collected for fuel. Based on MAgPIE Feed baskets, slaughter biomass and simple allocation rules.

Usage

```
calcExcretion(cellular = FALSE, cells = "lpjcell", attributes = "npk")
```

Arguments

cellular	if TRUE value is calculate and returned (set aggregate to FALSE!) on cellular level
cells	Switch between "magpiecell" (59199) and "lpjcell" (67420)
attributes	npk (default) or npkc (inclusing carbon) can be selected

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcExcretionIPCC()

Examples

```
## Not run:
calcOutput("Excretion")

## End(Not run)
```

---

calcExcretionIPCC *calcExcretionIPCC*

Description

calculates excretion in the year 2005 using the IPCC Guidelines excretion rates.

Usage

```
calcExcretionIPCC(products = "IPCC")
```

Arguments

products	IPCC: IPCC products. MAgPIE: Magpie products

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcExcretion(), calcAnimalStocks()

Examples

```
## Not run:
calcOutput("ExcretionIPCC")

## End(Not run)
```

calcFAOIntraYearProd *calcFAOIntraYearProd*

Description

Distribute massbalanced or FAOSTAT staple production to monthly or quarterly interval based on GGCMI crop calendar. Only national level implemented for now as cellular production only available on 5 year time steps due to memory. Assume rainfed crop calendar date for now.

Usage

```
calcFAOIntraYearProd(
  day = "harvest_day",
  products = "kcr",
  frequency = "monthly",
  attribute = "dm"
)
```

Arguments

day	harvest_day (to market) or maturity_day (first mature)
products	"kcr" or "staples" staples uses FAO production dataset instead of calcProduction to only give maize wheat soy and rice. Allows for more years. A bit of a David-specific subtype
frequency	monthly or quarterly. Daily leads to memory limits.
attribute	dm default. can only select one at a time due to memory #' @seealso readGGCMICropCalendar

Author(s)

David Chen

calcFAOmassbalance *calcFAOmassbalance*

Description

Calculates a massbalance dataset of agricultural production, processing and use out of the combined data of calcFAOharmonized(). Covers dry matter (DM), reactive nitrogen (Nr), Phosphorus (P), Generalizable Energy (GE) and wet matter (WM). New products are added to the Food Balance Sheets, and many processing conversions are made more explicit using simple assumptions. The first part of this function is the calcFAOmassbalance_pre.

Usage

```
calcFAOmassbalance()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky, Xiaoxi Wang

See Also

calcFAOmassbalance_pre()

Examples

```
## Not run:
calcOutput("FAOmassbalance")

## End(Not run)
```

---

calcFAOYield *calcFAOYield*

Description

calculates the yield based on FAO data

Usage

```
calcFAOYield(
  physical = TRUE,
  attributes = "dm",
  irrigation = FALSE,
  cellular = FALSE,
  cut = FALSE,
  average = 5,
  areaSource = "FAO"
)
```

Arguments

physical	physical area or havested area
attributes	in dm, wm, ge, nr, p, k
irrigation	distinguish irrigation or not
cellular	if TRUE value is calculate on cellular level
cut	FALSE (default) - do not cut off yields, number between 0 and 1 to define percentile value for cut off
average	averaging period in years (if NULL no averaging is used)
areaSource	data source for croparea used in calculation: FAO or Toolbox

Value

MAgPIE object of yields

Author(s)

Debbora Leip, Jan Philipp Dietrich, Kristine Karstens, Felicitas Beier

---

`calcFeedBalanceflow` *calcFeedBalanceflow*

Description

Calculates feed balanceflows from MAgPIE-Feed model to meet FAO data

Usage

```
calcFeedBalanceflow(
  per_livestock_unit = FALSE,
  cellular = FALSE,
  cells = "lpjcell",
  products = "kall",
  future = "constant"
)
```

Arguments

`per_livestock_unit`	default false
`cellular`	if TRUE value is calculate on cellular level
`cells`	Switch between "magpiecell" (59199) and "lpjcell" (67420)
`products`	products in feed baskets that shall be reported
`future`	if FALSE, only past years will be reported (reduces memory)

Value

List of magpie objects with results on country or cellular level, unit and description.

Author(s)

Isabelle Weindl, Kristine Karstens

Examples

```
## Not run:
calcOutput("FeedBalanceflow")

## End(Not run)
```

calcFeedBaskets *calcFeedBaskets*

Description

Combines feed baskets of the past with scenario-dependent future feed baskets.

Usage

```
calcFeedBaskets(non_eaten_food = FALSE, fadeout = FALSE, method = "new")
```

Arguments

non_eaten_food	if TRUE, non-eaten food is included in feed baskets, if not it is excluded.
fadeout	if TRUE, feed basket calibration fades out till 2050.
method	"new" for additive calibration at end, "old" for multiplikative calibration of calShr and end values.

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Isabelle Weindl, Benjamin Leon Bodirsky, Stephen Wirth, Jan Philipp Dietrich

Examples

```
## Not run:
calcOutput("FeedBaskets")

## End(Not run)
```

calcFeedBasketsPast *calcFeedBasketsPast*

Description

Calculate historical feed baskets based on output of MAgPIE_FEED model as DM feed biomass (different types of feed) needed per DM livestock products

Usage

```
calcFeedBasketsPast(non_eaten_food = TRUE)
```

Arguments

non_eaten_food if TRUE, non-eaten food is included in feed baskets, if not it is excluded.

Value

Historical feed baskets and corresponding weights as a list of two MAgPIE objects

Author(s)

Isabelle Weindl, Benjamin Bodirsky

See Also

calcOutput(), readFeedModel()

Examples

```
## Not run:
calcOutput("FeedBasketsPast")

## End(Not run)
```

---

calcFeedBasketsSysPast

Calculate historical system-specific feed baskets based on output of MAgPIE_FEED model as DM feed biomass (different types of feed) needed per DM livestock products of respective systems

---

Description

Calculate historical system-specific feed baskets based on output of MAgPIE_FEED model as DM feed biomass (different types of feed) needed per DM livestock products of respective systems

Usage

```
calcFeedBasketsSysPast()
```

Value

Historical system-specific feed baskets and corresonding weights as a list of two MAgPIE objects

Author(s)

Isabelle Weindl, Benjamin Bodirsky, Jan Philipp Dietrich

See Also

calcOutput(), readFeedModel(), calcFeedBasketsPast()

Examples

```
## Not run:
calcOutput("FeedBasketsSysPast")

## End(Not run)
```

---

calcFeedBasketsUncalibrated

calcFeedBasketsUncalibrated

Description

Combines uncalibrated feed baskets of the past with scenario-dependent future feed baskets.

Usage

```
calcFeedBasketsUncalibrated()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Isabelle Weindl, Benjamin Leon Bodirsky, Stephen Wirth, Jan Philipp Dietrich

Examples

```
## Not run:
calcOutput("FeedBasketsUncalibrated")

## End(Not run)
```

---

calcFeedEfficiencyFuture

calcFeedEfficiencyFuture

Description

Calculates future central feed shares for all livestock categories based on the results of a non-linear regression between historical central feed shares and livestock productivity and using Koeppen-Geiger climate zones

Usage

```
calcFeedEfficiencyFuture()
```

Value

Central feed shares and weights as list of two MAgPIE-objects

Author(s)

Isabelle Weindl, Benjamin Bodirsky, Stephen Wirth

Examples

```
## Not run:
calcOutput("FeedEfficiencyFuture")

## End(Not run)
```

`calcFeedPast` *calcFeedPast*

Description

Combines feed baskets of the past with livestock production to get total feed demand

Usage

```
calcFeedPast(
  balanceflow = TRUE,
  cellular = FALSE,
  cells = "lpjcell",
  products = "kall",
  nutrients = "all"
)
```

Arguments

`balanceflow`	if TRUE, non-eaten food is included in feed baskets, if not it is excluded.
`cellular`	if TRUE value is calculate on cellular level with returned datajust in dry matter
`cells`	Switch between "magpiecell" (59199) and "lpjcell" (67420)
`products`	products in feed baskets that shall be reported
`nutrients`	nutrients like dry matter (DM), reactive nitrogen (Nr), Phosphorus (P), Generalizable Energy (GE) and wet matter (WM).

Value

List of magpie objects with results on country or cellular level, unit and description.

Author(s)

Isabelle Weindl, Benjamin Leon Bodirsky, Kristine Karstems

Examples

```
## Not run:
calcOutput("FeedPast")

## End(Not run)
```

`calcFertilizerByCrop` *calcFertilizerByCrop*

Description

calculates the crop-specific use of different N inputs

Usage

```
calcFertilizerByCrop(
  indicator = "total",
  deposition = "Nsurplus2",
  cellular = FALSE
)
```

Arguments

`indicator`	total: estimates the inputs per total crop production; by_harvest estimates the inputs per ton harvest; by_area estimates the inputs per area harvested
`deposition`	if FALSE, deposition is not accounted for in the distribution. Use FALSE to avoid circularities in calcNitrogenBudget
`cellular`	cellular disaggreagation or national values

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

`calcNitrogenBudgetCropland()`

Examples

```
## Not run:
calcOutput("FertilizerByCrop")

## End(Not run)
```

`calcFertN` *Calculate Fertilizer of N*

Description

Provides FertN data for N.No changes to the content have been done.

Usage

```
calcFertN(
  appliedto = "total",
  cellular = FALSE,
  deposition = "CEDS",
  max_snupe = 0.85
)
```

Arguments

`appliedto`	'total' (default), 'crop' or 'past'
`cellular`	cellular disaggreagation or national values
`deposition`	for disaggregation will be passed on to calcNitrogenBudgetCropland
`max_snupe`	for disaggregation will be passed on to calcNitrogenBudgetCropland

Value

Fertilizer data for N and corresonding weights as a list of two MAgPIE objects

Author(s)

Lavinia Baumstark

See Also

`calcOutput()`, `readIFA()`, `convertIFA()`, `readSource()`

Examples

```
## Not run:
calcOutput("FertN")

## End(Not run)
```

calcFoodSupplyPast *calcFoodSupplyPast*

Description

Calculates the food supply (as defined by FAO, including intake and household waste) for the past.

Usage

```
calcFoodSupplyPast(
  per_capita = TRUE,
  products = NULL,
  product_aggr = FALSE,
  populationweight = "PopulationPast",
  attributes = c("kcal", "protein", "wm")
)
```

Arguments

per_capita	if true, calculates per capita demand per day, otherwhise total demand per year
products	a set with the products that shall be provided, e.g. kall. If NULL, the products are provided that are in the primary data
product_aggr	if TRUE, all products are summed up, if "maingroups" products are summed over livestock products, staples and vegfruits.
populationweight	datasource of populationweight: FAO can be selected in order to better meet exact values. Normal datasource is PopulationPast
attributes	attributes of different products,i.e., kcal,protein,wm

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky, Xiaoxi Wang

See Also

calcFAOharmonized()

Examples

```
## Not run:
calcOutput("FoodSupplyPast")

## End(Not run)
```

calcGDPppp *calcGDPppp*

Description

[Deprecated]

This function is defunct. Use `mrdrivers::calcGDP()` instead.

Usage

```
calcGDPppp(
  GDPpppCalib = NULL,
  GDPpppPast = NULL,
  GDPpppFuture = NULL,
  FiveYearSteps = TRUE,
  naming = NULL
)
```

Arguments

GDPpppCalib	to what should be calibrated? past, future or a transition?
GDPpppPast	GDPppp past data source
GDPpppFuture	GDPppp future data source
FiveYearSteps	Only five year steps if TRUE, FALSE returns years from source data
naming	naming scheme

Value

GDP PPP(ICP11) in million USD05 equivalents

See Also

`mrdrivers::calcGDP()`

calcGDPpppFuture *calcGDPpppFuture*

Description

[Deprecated]

This function is defunct. Use `mrdrivers::calcGDPFuture()` instead.

Usage

```
calcGDPpppFuture(GDPpppFuture = NULL)
```

Arguments

GDPpppFuture	GDPppp future data source

Value

GDP PPP(ICP11) in million USD05 equivalents

See Also

mrdrivers::calcGDPFuture()

---

calcGDPpppPast *calcGDPpppPast*

Description

[Deprecated]

This function is defunct. Use mrdrivers::calcGDPPast() instead.

Usage

```
calcGDPpppPast(GDPpppPast = "WDI-MI")
```

Arguments

GDPpppPast	GDPppp future data source

Value

GDP PPP(ICP11) in million USD05 equivalents

See Also

mrdrivers::calcGDPPast()

calcGovernanceIndicator *calcGovernanceIndicator*

Description

returns governance indicator from Andrijevic et al. 2019

Usage

```
calcGovernanceIndicator()
```

Value

magpie object at iso-country level

Author(s)

Felicitas Beier

Examples

```
## Not run:
calcOutput("GovernanceIndicator", aggregate = FALSE)

## End(Not run)
```

calcGrowingStock *calcGrowingStock*

Description

Calculates the growing stocks on FAO data.

Usage

```
calcGrowingStock()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Abhijeet Mishra

Examples

```
## Not run:
calcOutput("GrowingStock", aggregate = TRUE)

## End(Not run)
```

`calcGrowingStockNatVegAbsolute` *calcGrowingStockNatVegAbsolute*

Description

Calculates the growing stocks on FAO data.

Usage

```
calcGrowingStockNatVegAbsolute()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Abhijeet Mishra

Examples

```
## Not run:
calcOutput("GrowingStockNatVegAbsolute", aggregate = TRUE)

## End(Not run)
```

`calcGrowingStockNRF` *calcGrowingStockNRF*

Description

Calculates the growing stocks from FAO data for naturally regenerating forests i.e. primary forests and secondary forests.

Usage

```
calcGrowingStockNRF()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Abhijeet Mishra

Examples

```
## Not run:
calcOutput("GrowingStockNRF", aggregate = TRUE)

## End(Not run)
```

`calcGrowingStockpha` *calcGrowingStockpha*

Description

Calculates the growing stocks on FAO data.

Usage

```
calcGrowingStockpha()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Abhijeet Mishra

Examples

```
## Not run:
calcOutput("GrowingStockpha", aggregate = TRUE)

## End(Not run)
```

`calcGrowingStockPlantAbsolute` *calcGrowingStockPlantAbsolute*

Description

Calculates the growing stocks on FAO data.

Usage

```
calcGrowingStockPlantAbsolute()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Abhijeet Mishra

Examples

```
## Not run:
calcOutput("GrowingStockPlantAbsolute", aggregate = TRUE)

## End(Not run)
```

`calcGrowingStockPlantations` *calcGrowingStockPlantations*

Description

Calculates the growing stocks on FAO data.

Usage

```
calcGrowingStockPlantations()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Abhijeet Mishra

Examples

```
## Not run:
calcOutput("GrowingStockPlantations", aggregate = TRUE)

## End(Not run)
```

---

calcGTAPTotalTransportCosts

calcGTAPTotalTransportCosts

Description

Calculates iso-level total global transport costs from GTAP for GTAP food commodities

Usage

```
calcGTAPTotalTransportCosts(costType = "transport", version = "9")
```

Arguments

costType	transport or wholesale
version	"81" or "9"

Value

List of magpie object with results on country level, unit and description.

Author(s)

David M Chen

Examples

```
## Not run:
calcOutput("GTAPTotalTransportCosts")

## End(Not run)
```

calcHistBioplasticProd *calcHistBioplasticProd*

Description

calculates historic bioplastic production based on data and linear extrapolation

Usage

```
calcHistBioplasticProd()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Debbora Leip

Examples

```
## Not run:
calcOutput("HistBioplasticProd")

## End(Not run)
```

calcHistEmissions *historical emissions per sector or mac*

Description

Provides historical emissions values per economic sector or per mac sector. For now it only includes European data.

Usage

```
calcHistEmissions(subtype = "sector")
```

Arguments

subtype	Either "sector" or "MAC"

Value

magpie object of historical emissions data

Author(s)

Renato Rodrigues

Examples

```
## Not run:
calcOutput("HistEmissions")

## End(Not run)
```

`calcIniFoodPrice` *calcIniFoodPrice*

Description

provides global prices from the IMPACT model projections for MAgPIE commodities for the initialization of the flexible demand model.

Usage

```
calcIniFoodPrice(datasource = "FAO", year = "y2005", products = "kfo")
```

Arguments

`datasource`	The datasource specification. Currently available `FAO` and `IMPACT3.2.2World_Price`.
`year`	Specifies the year for the initialization of prices in MAgPIE. Default is `y2005`.
`products`	subselection of products to be returned

Value

List with a magpie object with commodity prices on global level in $05/tDM.

Note

The IMPACT projections start in 2005 and the prices are taken from that year.

Author(s)

Mishko Stevanovic, Benjamin Leon Bodirsky

See Also

`readIMPACT3.2.2World_Price()`

Examples

```
## Not run:
calcOutput("IniFoodPrice", aggregate = FALSE)

## End(Not run)
```

`calcIntake` *calcIntake*

Description

it computes the total intake kcal/day procapita through the population dataset by Lutz 2014, height and BMI data of NCDrisc, and phyiscal inactivity levels based on Halal et al.

Usage

```
calcIntake(
  convert = TRUE,
  modelinput = FALSE,
  standardize = FALSE,
  method = "FAO_WHO_UNU1985"
)
```

Arguments

`convert`	if TRUE, Lutz data is converted (interpolated completed etc)
`modelinput`	if TRUE, data is aggregated to country totals for model input
`standardize`	if FALSE, no standardization. if "recommendations", the US recommendations are used. if BMI, a normal BMI is used.
`method`	method for calculating intake: either FAO_WHO_UNU1985 for estimates based on height and bodyweight, schofield for just bodyweight, or HHS_USDA for recommended values for US-americans

Value

total "healthy" intake kcal/day procap for each countries divided by sex and 8 age groups.

Author(s)

Benjamin Leon Bodirsky

calcIntakeBodyweight *calcIntakeBodyweight*

Description

it computes the food intake pro capita through the bodyweight and the activity level. First it computes the basal metabolic rate (bmr) through the Schofield equation and then the estimated energy required (eer) depending on the activitiy level by FAO/WHO/UNU tables (Human Energy Requirments, Rome 2004)

Usage

```
calcIntakeBodyweight(
  bodyweight,
  bodyheight = NULL,
  inactivity,
  tmean = NULL,
  method = NULL
)
```

Arguments

bodyweight	bodyweight in kg per capita or "standardized" for assuming standard values
bodyheight	for mehthod FAO_WHO_UNU1985
inactivity	Share of population inactive, provided as magpie object with different age groups
tmean	mean annual temperature
method	method for calculating intake: either FAO_WHO_UNU1985 for estimates based on height and bodyweight, schofield for just bodyweight, or HHS_USDA for recommended values for US-americans

Author(s)

Eleonora Martinelli

calcIOEdgeBuildings *calcIOEdgeBuildings*

Description

Calculates buildings-related energy flows from the IEA energy balances. 'output_EDGE_buildings' is a key input to EDGE-Buildings providing the historic final energy demand from buildings. 'output_EDGE' does the same for buildings and industry together.

Usage

```
calcIOEdgeBuildings(
  subtype = c("output_EDGE", "output_EDGE_buildings"),
  ieaVersion = "default"
)
```

Arguments

subtype	Data subtype. See default argument for possible values.
ieaVersion	Release version of IEA data, either 'default' (vetted and used in REMIND) or 'latest'.

Value

IEA data as MAgPIE object aggregated to country level

Author(s)

Pascal Sauer, Anastasis Giannousakis

See Also

calcOutput

Examples

```
## Not run:
a <- calcOutput("IOEdgeBuildings", subtype = "output_EDGE_buildings")

## End(Not run)
```

---

calcIPCCefNSoil *calcIPCCefNSoil*

Description

Emission factors for croplands based on IPCC using a country-level leaching fraction

Usage

```
calcIPCCefNSoil()
```

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("IPCCefNSoil")

## End(Not run)
```

`calcIPCCfracLeach` *calcIPCCfracLeach*

Description

calculates the leaching rate FRAC_LEACH as defined by the IPCC Guidelines for National Greenhouse Gas Inventories 2006. We use the approach used by Canada, see Velthof, Gerardus Lambertus, and J. Mosquera Losada. 2011. Calculation of Nitrous Oxide Emission from Agriculture in the Netherlands: Update of Emission Factors and Leaching Fraction. Alterra. http://library.wur.nl/WebQuery/wurpubs/406284.

Usage

```
calcIPCCfracLeach(cellular = TRUE)
```

Arguments

`cellular`	if true, returned on cell level

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

`calcOutput()`

Examples

```
## Not run:
a <- calcOutput("IPCCfracLeach", cellular = FALSE)

## End(Not run)
```

calcLandArea *calcLandArea*

Description

total land area in a cell

Usage

```
calcLandArea(cells = "lpjcell")
```

Arguments

cells	"magpiecell" for 59199 cells or "lpjcell" for 67420 cells

Value

magpie object in cellular resolution

Author(s)

Jan Philipp Dietrich, Felicitas Beier

Examples

```
## Not run:
calcOutput("LandArea", aggregate = FALSE)

## End(Not run)
```

calcLandEmissions *calcLandEmissions*

Description

Land emission data. This function was originally called calcValidEmissions and located in mrvalidation.

Usage

```
calcLandEmissions(datasource = "CEDS")
```

Arguments

datasource	The Emission Inventory that shall be used. For futher information, best see function calcEmissionInventory. Options are e.g. CEDS, combined_CEDS_IPCC (including own estimates where available), IPCC(own estimates), Nsurplus (own estimates)

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky, Michael S. Crawford

Examples

```
## Not run:
calcOutput("LandEmissions")

## End(Not run)
```

---

calcLanduseIntensity *calcLanduseIntensity*

Description

This function prepares total tau values for use. As the source data already provides all required information this function purely removes unrequired data and moves the xref values to the weighting object which is required for aggregation.

Usage

```
calcLanduseIntensity(sectoral = "kcr", rescale = TRUE)
```

Arguments

sectoral	"kcr" (default) for MAgPIE crop items and "lpj" for LPJmL crop items, "pasture" for pasture
rescale	TRUE (default), if Tau should be rescaled in a way, that 2010 is always 1

Value

Total tau data and corresponding weights as a list of two MAgPIE objects

Author(s)

Benjamin Leon Bodirsky, Kristine Karstens, Felicitas Beier

See Also

calcTauTotal(), readTau(), convertTau()

Examples

```
## Not run:
calcOutput("LanduseIntensity")

## End(Not run)
```

---

calcLivestockGridded *calcLivestockGridded*

Description

Distributes crop, pasture and livestock production in space to 0.5 degree

Usage

```
calcLivestockGridded(details = FALSE)
```

Arguments

details	switch, if set to TRUE will lead to reporting of extensive and intensive livestock shares

Value

List of magpie objects with results on cellular level, weights on cellular level, unit and description.

Author(s)

Kristine Karstens

Examples

```
## Not run:
calcOutput("calcLivestockGridded")

## End(Not run)
```

calcLivestockProductivity *Calculate Yields for Livestock*

Description

Provides MAgPIE-FEED data for livestock-yields calculated in the regression for feed (calcRegressionFEED).. No changes to the content have been done, besides renaming and providing weights.

Usage

```
calcLivestockProductivity(future = TRUE)
```

Arguments

future	if TRUE calculates Constant future and linear trends based on SSP Expert guesses

Value

MAgPIE-FEED data for livestock-yields and corresonding weights as a list of two MAgPIE objects

Author(s)

Isabelle Weindl, Lavinia Baumstark, Stephen Wirth

See Also

calcOutput(), readSource()

Examples

```
## Not run:
calcOutput("LivestockProductivity")

## End(Not run)
```

calcLPJmL *calcLPJmL*

Description

Handle LPJmL data and its time behaviour (averaging, approximation, harmonizing to baseline)

Usage

```
calcLPJmL(
  version = "LPJmL4",
  climatetype = "CRU_4",
  subtype = "soilc",
  subdata = NULL,
  time = "raw",
  averaging_range = NULL,
  dof = NULL,
  harmonize_baseline = FALSE,
  ref_year = "y2015",
  limited = TRUE,
  hard_cut = FALSE,
  selectyears = "all"
)
```

Arguments

version	Switch between LPJmL4 and LPJmL4
climatetype	Switch between different climate scenarios (default: "CRU_4")
subtype	Switch between different lpjml input as specified in readLPJmL
subdata	Switch between data dimension subitems
time	average, spline or raw (default)
averaging_range	just specify for time=="average": number of time steps to average
dof	just specify for time=="spline": degrees of freedom
harmonize_baseline	FALSE (default) nothing happens, if a baseline is specified here data is harmonized to that baseline (from ref_year on)
ref_year	just specify for harmonize_baseline != FALSE : Reference year
limited	just specify for harmonize_baseline != FALSE : if TRUE limited approached is used
hard_cut	just specify for harmonize_baseline != FALSE : use hard cut instead of multiplicative factor
selectyears	defaults to all years available

Value

List of magpie objects with results on cellular level, weight, unit and description.

Author(s)

Kristine Karstens, Felicitas Beier

See Also

readLPJmL()

Examples

```
## Not run:
calcOutput("LPJmL", version = "LPJmL4", climatetype = "CRU_4", subtype = "soilc", aggregate = FALSE)

## End(Not run)
```

`calcMacBaseLandUse` *calcMacBase calculate MacBase*

Description

calcMacBase calculate MacBase

Usage

```
calcMacBaseLandUse(subtype)
```

Arguments

`subtype`	Source of subset of emissions

Value

magpie object

Author(s)

David Klein, Julian Oeser

See Also

`calcOutput()`

Examples

```
## Not run:
a <- calcOutput(type = "MacBaseLandUse")

## End(Not run)
```

`calcMACCsCH4` *Calculation of CH4 MAC curves of Energy Industry and Landuse*

Description

Calculation of the CH4 relative costcurves (subtypes: Energy Industry and Landuse) weighted by the baseline emissions. Sources: CH4 coal losses/leakages, CH4 oil losses/leakages, CH4 natural gas losses/leakages, CH4 Landfills, CH4 Domestic Sewage, CH4 Wetland rice, CH4 Animals, CH4 Animal waste divided in classes 1-201.

Usage

```
calcMACCsCH4(sector = "all", source = "ImageMacc")
```

Arguments

`sector`	"all" or "landuse"; "all" includes energy_industry and landuse
`source`	"ImageMacc" or "PBL_MACC_2019"

Value

MAgPIE object

Author(s)

Nele Steinmetz, Florian Humpenoeder, Michael Windisch

See Also

`calcOutput()`, `readImageMacc()`, `convertImageMacc()`

Examples

```
## Not run:
calcOutput("MACCsCH4")

## End(Not run)
```

calcMACCsN2O *Calculation of N2O MAC curves of Energy Industry and Landuse*

Description

Calculation of the N2O relative costcurves (subtypes: Energy Industry and Landuse) weighted by the baseline emissions. Sources: N2O Transport, N2O Adipic acid production, N2O Nitric acid production, N2O Fertilizer, N2O Animal waste, N2O Domestic sewage divided in classes 1-201.

Usage

```
calcMACCsN2O(sector = "all", source = "ImageMacc")
```

Arguments

sector	"all" or "landuse"; "all"" includes energy_industry and landuse
source	"ImageMacc" or "PBL_MACC_2019"

Value

MAgPIE object

Author(s)

Nele Steinmetz, Florian Humpenoeder, Michael Windisch

See Also

calcOutput(), readImageMacc(), convertImageMacc()

Examples

```
## Not run:
calcOutput("MACCsN2O")

## End(Not run)
```

calcManureFuelShr *calcManureFuelShr*

Description

calculates the share of Manure excreted during grazing which is collected for fuel. For the future, we assume that with the development, the fuel share reaches 0.

Usage

```
calcManureFuelShr(products = "magpie")
```

Arguments

products	IPCC: IPCC products. MAgPIE: Magpie products

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcExcretion()

Examples

```
## Not run:
calcOutput("ManureFuelShr")

## End(Not run)
```

calcManureRecyclingCroplandPast
calcManureRecyclingCroplandPast

Description

calculates manure recycling to cropland based on excretions, animal waste management types (and their shares per country) and emission factors for nitrogenous emissions in livestock confinements

Usage

```
calcManureRecyclingCroplandPast(
  products = "sum",
  cellular = FALSE,
  cells = "lpjcell"
)
```

Arguments

products	"sum" (default) or "kli"
cellular	if TRUE value is calculate and returned (set aggregate to FALSE!) on cellular level
cells	Switch between "magpiecell" (59199) and "lpjcell" (67420)

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky, Kristine Karstens

See Also

calcExcretion()

Examples

```
## Not run:
calcOutput("calcManureRecyclingCroplandPast")

## End(Not run)
```

---

calcNitrogenBNF *calcNitrogenBNF*

Description

calculates fixation from freeliving bacteria and from nitrogen-fixing crops and natural vegetation

Usage

```
calcNitrogenBNF(cellular = FALSE)
```

Arguments

cellular	cellular disaggreagation or national values

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcNitrogenFixationPast()

Examples

```
## Not run:
calcOutput("NitrogenBNF")

## End(Not run)
```

`calcNitrogenBudgetCropland` *calcNitrogenBudgetCropland*

Description

Calculates Nitrogen Budgets for Cropland soils on country levels.

Usage

```
calcNitrogenBudgetCropland(
  cellular = FALSE,
  deposition = "CEDS",
  include_fertilizer = TRUE,
  max_snupe = 0.85
)
```

Arguments

`cellular`	disaggregated to 0.5 degree grid
`deposition`	if FALSE, deposition is not accounted for in the distribution. Use FALSE to avoid circularities in calcNitrogenBudget
`include_fertilizer`	including fertilizer in budget. Use FALSE to avoid circularities in specific cases
`max_snupe`	NULL or a numeric value. if numeric, an additional N balanceflow is included that takes care that the soil nitrogen uptake efficiency does not exceed the numeric value in balanceflow.

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("NitrogenBudgetCropland")

## End(Not run)
```

`calcNitrogenBudgetNonagland`
calcNitrogenBudgetNonagland

Description

Calculates Nitrogen Budgets for Non-agricultural land on country levels.

Usage

```
calcNitrogenBudgetNonagland(
  deposition = "CEDS",
  max_nue = 0.95,
  cellular = FALSE
)
```

Arguments

`deposition`	if FALSE, deposition is not accounted for in the distribution. Use FALSE to avoid circularities in calcNitrogenBudget
`max_nue`	NULL or a numeric value. if numeric, an additional N balanceflow is included that takes care that the nitrogen use efficiency does not exceed the numeric value in balanceflow.
`cellular`	TRUE returns output on 0.5° grid

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("NitrogenBudgetNonagland")

## End(Not run)
```

---

calcNitrogenBudgetOcean *calcNitrogenBudgetOcean*

Description

Calculates Nitrogen Budgets for Oceans on global level. Values are placed in Antarcica (ATA)

Usage

```
calcNitrogenBudgetOcean(deposition = "ACCMIP", leaching = "Nsurplus")
```

Arguments

deposition	Method for calculating Atmospheric deposition: Nsurplus2 and Nsurplus are based on deposition rates based on own emission calculations after 2 or after 1 iteration, respectively.
leaching	Method for calculating leaching: Nsurplus2 and Nsurplus are based on deposition rates based on own emission calculations after 2 or after 1 iteration, respectively.

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("NitrogenBudgetOcean")

## End(Not run)
```

calcNitrogenBudgetPasture *calcNitrogenBudgetPasture*

Description

Calculates Nitrogen Budgets for Pasture soils on country levels.

Usage

```
calcNitrogenBudgetPasture(
  cellular = FALSE,
  include_fertilizer = TRUE,
  deposition = "CEDS",
  max_nue = 0.9
)
```

Arguments

cellular	cellular disaggreagation or national values
include_fertilizer	including fertilizer in budget. Use FALSE to avoid circularities in specific cases
deposition	if FALSE, deposition is not accounted for in the distribution. Use FALSE to avoid circularities in calcNitrogenBudget
max_nue	NULL or a numeric value. if numeric, an additional N balanceflow is included that takes care that the nitrogen use efficiency does not exceed the numeric value in balanceflow.

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("NitrogenBudgetPasture")

## End(Not run)
```

calcNitrogenFixationPast *calcNitrogenFixationPast*

Description

calculates fixation from freeliving bacteria and from nitrogen-fixing crops

Usage

```
calcNitrogenFixationPast(
  fixation_types = "both",
  sum_plantparts = TRUE,
  cellular = FALSE,
  irrigation = FALSE
)
```

Arguments

fixation_types	either "fixation_crops", "fixation_freeliving", or "both"
sum_plantparts	if false, crop residues, belowground residues and harvested organ are reported separately
cellular	cellular estimates optional
irrigation	if TRUE, distinguishes irrigated and non-irrigated crops

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcNitrogenFixationPast()

Examples

```
## Not run:
calcOutput("calcNitrogenFixationPast")

## End(Not run)
```

calcNitrogenFixationRateNatural
calcNitrogenFixationRateNatural

Description

calculates fixation rates from natural ecosystems based on evapostranspiration

Usage

```
calcNitrogenFixationRateNatural(cells = "lpjcell")
```

Arguments

cells	"magpiecell" for 59199 cells or "lpjcell" for 67420 cells

Value

List of magpie objects with results on global level, empty weight, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcNitrogenFixationPast() readHerridge()

Examples

```
## Not run:
calcOutput("NitrogenFixationRateNatural")

## End(Not run)
```

calcNitrogenWithdrawalByCrop
calcNitrogenWithdrawalByCrop

Description

calculates the crop-specific withdrawals of nutrients from soils

Usage

```
calcNitrogenWithdrawalByCrop(
  indicator = "total",
  cellular = FALSE,
  irrigation = FALSE
)
```

Arguments

indicator	total: estimates the inputs per total crop production; by_area estimates the inputs per area harvested
cellular	cellular disaggreagation or national values
irrigation	FALSE for the sum of irrigated and rainfed, FALSE for separated categories, 'rainfed' or 'irrigated for single categories

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcNitrogenBudgetCropland()

Examples

```
## Not run:
calcOutput("NitrogenWithdrawalByCrop")

## End(Not run)
```

---

calcNuePasture *calcNuePasture*

Description

calculates the soil nitrogen uptake efficiency of pastures. # This is the nitrogen taken up from the soil (N in crop biomass minus biological fixation minus seed N) divided by the soil N inputs (fertilizer, manure etc). For the future, NUE scenarios are added.

Usage

```
calcNuePasture(cellular = FALSE, maccbase = TRUE)
```

Arguments

cellular	cellular disaggreagation or national values
maccbase	whether future scenarios should be expressed as base efficiency, excluding additional macc improvements (new default)

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcSNUpE() calcNitrogenBudgetPasture()

Examples

```
## Not run:
calcOutput("NuePasture")

## End(Not run)
```

---

calcNutrientBudgetSewage

calcNutrientBudgetSewage

Description

Nutrient Budget for Wastewater treatment and sewage

Usage

```
calcNutrientBudgetSewage(historic = TRUE)
```

Arguments

historic	when TRUE only for the historic period, otherwise including future scenarios

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcNitrogenBudgetCropland()

Examples

```
## Not run:
calcOutput("NutrientBudgetSewage")

## End(Not run)
```

---

calcPhysicalInactivity

calcPhysicalInactivity

Description

physical inactivity level estimate based on Hallal, Pedro C, Lars Bo Andersen, Fiona C Bull, Regina Guthold, William Haskell, and Ulf Ekelund. 2012. "Global Physical Activity Levels: Surveillance Progress, Pitfalls, and Prospects." The Lancet 380 (9838):247-57. https://doi.org/10.1016/S0140-6736(12)60646-1.

Usage

```
calcPhysicalInactivity(update = TRUE)
```

Arguments

update	WHO estimates from http://apps.who.int/gho/data/view.main.2487?lang=en seem to have updated. TRUE provides the results as they were online on 27.2.2024

---

calcPlantationCellular

calcPlantationCellular

Description

Calculates the cellular plantation area based on carbon densities

Usage

```
calcPlantationCellular()
```

Value

List of magpie object with results on cellular level, weight on cellular level, unit and description.

Author(s)

Abhijeet Mishra

Examples

```
## Not run:
calcOutput("PlantationCellular")

## End(Not run)
```

`calcPlantEstablishCalib`

calcPlantEstablishCalib

Description

Calculates the calibration factors for plantation establishment globally

Usage

```
calcPlantEstablishCalib()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Abhijeet Mishra

Examples

```
## Not run:
calcOutput("PlantEstablishCalib", aggregate = TRUE)

## End(Not run)
```

calcPriceAgriculture *calcPriceAgriculture*

Description

provides global prices from the IMPACT model projections, World Bank observations, and FAO observations for MAgPIE commodities in $/tDM

Usage

```
calcPriceAgriculture(datasource = "IMPACT3.2.2World_Price", unit = "US$05/tDM")
```

Arguments

datasource	Options of the source of data: IMPACT3.2.2World_Price, FAO, FAOp and WBGEM
unit	A string with the unit that should be returned. Options are: • "current LCU" • "current Int$PPP" • "current US$MER" • "constant YYYY LCU" • "constant YYYY Int$PPP" • "constant YYYY US$MER"

Value

List with a magpie object with commodity prices

Author(s)

Mishko Stevanovic, Xiaoxi Wang, Felicitas Beier

See Also

readIMPACT3.2.2World_Price(), calcWBGEM(), readWBGEM()

Examples

```
## Not run:
calcOutput("PriceAgriculture", datasource = "IMPACT3.2.2World_Price", aggregate = FALSE)
calcOutput("PriceAgriculture", datasource = "FAO")
calcOutput("PriceAgriculture", datasource = "WBGEM", aggregate = FALSE)

## End(Not run)
```

calcProdSysRatioPast *Calculate historical distribution of livestock production across different systems based on output of MAgPIE_FEED model*

Description

Calculate historical distribution of livestock production across different systems based on output of MAgPIE_FEED model

Usage

```
calcProdSysRatioPast()
```

Value

Historical distribution of livestock production across different systems and corresponding weights as a list of two MAgPIE objects

Author(s)

Isabelle Weindl

See Also

`calcOutput()`, `readFeedModel()`

Examples

```
## Not run:
calcOutput("ProdSysRatioPast")

## End(Not run)
```

calcProduction *calcProduction*

Description

Distributes crop, pasture and livestock production in space to 0.5 degree

Usage

```
calcProduction(
  products = "kcr",
  cellular = FALSE,
  cells = "lpjcell",
  calibrated = TRUE,
  attributes = "all",
  irrigation = FALSE
)
```

Arguments

products	setname of products ("kcr", "kli", "pasture")
cellular	if TRUE production is calculate on cellular level
cells	Switch between "magpiecell" (59199) and "lpjcell" (67420)
calibrated	if FALSE, lpj yields will be used uncalibrated, if true, calibrated on FAP production on country level
attributes	"All" for all crop attributes, or specify e.g. DM (dry matter), Nr (nitrogen) for memory reduction
irrigation	if TRUE, additional information on irrigated and rainfed production is provided

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcLanduseInitialisation(), calcCroparea()

Examples

```
## Not run:
calcOutput("Production")

## End(Not run)
```

calcRegressionParameters *calcRegressionParameters*

Description

Writes down the equation parameters from various data sources

Usage

```
calcRegressionParameters(regression = "bmi_shr")
```

Arguments

regression	bmi_shr: Shares of BMI withina population. schofield or FAO_WHO_UNU1985: calculates intake based on anthropometrics

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("RegressionParameters")

## End(Not run)
```

calcResBiomass *calcResBiomass*

Description

Provides MAgPIE-FEED data for aboveground and belowground residues biomass

Usage

```
calcResBiomass(
  cellular = FALSE,
  cells = "lpjcell",
  plantparts = "both",
  irrigation = FALSE,
  attributes = "all",
  scenario = "default"
)
```

Arguments

cellular	If TRUE calculation and output on cellular level
cells	Switch between "magpiecell" (59199) and "lpjcell" (67420)
plantparts	both, ag (aboveground) or belowground (bg). Both can have memory problems for cellular outputs
irrigation	if TRUE, distinguishes irrigated and non-irrigated crops
attributes	in dm, wm, ge, nr, p, k
scenario	define scenario switch for sensititvy analysis for historical SOC budget

Value

MAgPIE-FEED data for ProdResAg and corresonding weights as a list of two MAgPIE objects

Author(s)

Lavinia Baumstark, Isabelle Weindl, Benjamin Bodirsky

See Also

calcOutput(), readSource()

Examples

```
## Not run:
calcOutput("ResBiomass")

## End(Not run)
```

calcResDemand *calcResDemand*

Description

Calculates the demand for Crop Residues

Usage

```
calcResDemand(cellular = FALSE, scenario = "dafault")
```

Arguments

cellular	If TRUE calculation and output on cellular level
scenario	define scenario switch for sensititvy analysis for historical SOC budget

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

See Also

calcResBiomass()

Examples

```
## Not run:
calcOutput("ResDemand")

## End(Not run)
```

calcResFieldBalancePast *calcResFieldBalancePast*

Description

Calculates data for aboveground and belowground residues production with other usage

Usage

```
calcResFieldBalancePast(
  cellular = FALSE,
  products = "sum",
  scenario = "default"
)
```

Arguments

cellular	If TRUE calculation and output on cellular level
products	"sum" (default) or "kres"
scenario	define scenario switch for sensititvy analysis for historical SOC budget

Value

data

Author(s)

Benjamin Bodirsky

See Also

calcOutput(), readSource()

Examples

```
## Not run:
calcOutput("ResFieldBalancePast")

## End(Not run)
```

---

calcResFor2ndBioengery

calcResFor2ndBioengery

Description

Calculates the supply potential of Crop Residues for 2nd generation bioenergy for future and different ssp scenarios

Usage

```
calcResFor2ndBioengery(products = "all", product_aggr = TRUE, add_off = FALSE)
```

Arguments

products	categorie (set) that should be reported, switch between "kres", "res_crop" (sum over all "kres"), "res_wood" and "all"
product_aggr	boolean, if product set should be summed up
add_off	add a column with empty supply for no residues available for 2nd gen BE

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Kristine Karstens

See Also

calcResFor2ndBioengery()

Examples

```
## Not run:
calcOutput("ResFor2ndBioengery")

## End(Not run)
```

---

calcRockNWeathering *calcRockNWeathering*

Description

calculates amount of yearly N from rock weathering by country or global total, disaggregated by land use type (LUH2v2 6 class, with FAO forest correction)

Usage

```
calcRockNWeathering()
```

Value

MAgPIE object of amount of N (Mt)

Author(s)

David M Chen

calcSeed *calcSeed*

Description

Calculates Seed demand

Usage

```
calcSeed(
  cellular = FALSE,
  cells = "lpjcell",
  products = "kall",
  irrigation = FALSE,
  attributes = "all"
)
```

Arguments

cellular	cellular or regional level
cells	Switch between "magpiecell" (59199) and "lpjcell" (67420)
products	kcr or also kall, which includes seeds for eggs and fish
irrigation	if TRUE, distinguishes irrigated and non-irrigated crops
attributes	in dm, wm, ge, nr, p, k

Value

List of magpie object with results and weight on country or cellular level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("Seed")

## End(Not run)
```

calcSNUpE *calcSNUpE*

Description

calculates the soil nitrogen uptake efficiency. This is the nitrogen taken up from the soil (N in crop biomass minus biological fixation minus seed N) divided by the soil N inputs (fertilizer, manure etc). For the future, SNuPE scenarios are added.

Usage

```
calcSNUpE(max_snupe = 0.85, cellular = FALSE, rev = 0.1, maccbase = TRUE)
```

Arguments

max_snupe	Maximum realistic SNUPE. All values above will be limited to this value. Only holds for past values; future scneario values can exceed this number.
cellular	disaggregated to 0.5 degree grid
rev	revision number of madrat run
maccbase	whether future scenarios should be expressed as base efficiency, excluding additional macc improvemetns (new default)

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky, Xiaoxi Wang

See Also

calcNitrogenBudgetCropland()

Examples

```
## Not run:
calcOutput("SNUpE")

## End(Not run)
```

calcSOCLossShare *calcSOCLossShare*

Description

Calculates soil organic carbon loss share on cellular level

Usage

```
calcSOCLossShare(
  subsystems = FALSE,
  rate = "change",
  factor = "ipccReduced",
  cells = "lpjcell"
)
```

Arguments

subsystems	if FALSE just generic values will be used per climate zone , if TRUE crop specific values will be reported, if aggregated crop specific factors will be aggregated using crop area
rate	if change, change rates will be reported; if loss, loss rates will be reported
factor	switch for different ipcc versions (ipccReduced, ipccReduced2019)
cells	"magpiecell" for 59199 cells or "lpjcell" for 67420 cells

Value

List of magpie objects with results on cellular level, weight, unit and description.

Author(s)

Kristine Karstens

Examples

```
## Not run:
calcOutput("SOCLossShare", aggregate = FALSE)

## End(Not run)
```

calcSOM *calcSOM*

Description

calculates Soil Organic Matter Pool, accounting for the management history. We assume carbon Stocks from LPJml natural vegetation as a starting point. Here we use the upper 30cm soil layer (0-20cm of + 1/3 of 30-50 cm). We then correct carbon pools by lost c-share depending on the climate region, using default factors of IPCC Guidelines 2006 table 5.5. We assume that this IPCC-corrected value is the target long-term equilibrium value for the soil stocks. Because soil decline and build-up slowly, we assume that in every year, the carbon pools move 15% towards this new equilibrium. This assumption is in line with IPCC saying that the process will take 20 years: with our assumption, after 5 years 44% of the carbon pool is gone, after 10 years 80% and after 20 years 96%. We determine a carbon stock for cropland soils and non-cropland soils in every cell. If the cropland area expands, the carbon stock of noncropland is proportionally assigned to the cropland pool and vice versa. The outputs of the function are the soilc stocks for cropland and non-cropland. Relevant for the release of N by SOM loss is also the change in carbon stocks per ha, as this relases or binds N. This is done in delta cropland soilc.

Usage

```
calcSOM(climatetype = "historical", subtype = "stock", cells = "lpjcell")
```

Arguments

climatetype	Switch between different climate scenarios (default on "historical")
subtype	"stock" (default) for absoulte values, "density" for per hectar values
cells	"magpiecell" for 59199 cells or "lpjcell" for 67420 cells

Value

List of magpie object with results on country or cellular level, weight on cellular level, unit and description.

Author(s)

Benjamin Leon Bodirsky, Kristine Karstens

Examples

```
## Not run:
calcOutput("SOM2")

## End(Not run)
```

calcSOMlossN *calcSOMlossN*

Description

calculates effect on N from Soil Organic Matter loss

Usage

```
calcSOMlossN(cellular = FALSE, cells = "lpjcell")
```

Arguments

cellular	if TRUE cellular level is returned
cells	"magpiecell" for 59199 cells or "lpjcell" for 67420 cells

Value

List of magpie object with results on country or cellular level, weight on cellular level, unit and description.

Author(s)

Benjamin Leon Bodirsky,

Examples

```
## Not run:
calcOutput("SOMlossN")

## End(Not run)
```

calcStorage *calcStorage*

Description

calculates stock levels of magpie commodities based on FAO data. FAO data only has stock variation so we assume lowest level for each product/country as 0 level USDA data to be potentially included in future second data source

Usage

```
calcStorage(datasource = "FAO")
```

Arguments

datasource	Options of the source of data, currently only FAO: FAO.

Value

List with a magpie object with stock level in tonnes

Author(s)

David Chen

Examples

```
## Not run:
calcOutput("Storage", datasource = "FAO")

## End(Not run)
```

---

calcTemperature *calcTemperature*

Description

calculates average monthly temperature on different landuse types

Usage

```
calcTemperature(landusetypes = "all", months = FALSE, convert = TRUE)
```

Arguments

landusetypes	all or only one (to save computation memory)
months	FALSE for yearly average, TRUE for monthly values
convert	FALSE for raw values of temperature, TRUE add temperature of 15 degrees for countries without observations or land mass.

Value

List of magpie object with results on country level, weight on country level, unit and description.

Author(s)

Benjamin Leon Bodirsky

Examples

```
## Not run:
calcOutput("Temperature")

## End(Not run)
```

---

calcTimberDemand *calcTimberDemand*

Description

Calculates the demand of timber from FAO data (including intermediate products).

Usage

```
calcTimberDemand()
```

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Abhijeet Mishra

See Also

calcFAOmassbalance_pre()

Examples

```
## Not run:
calcOutput("TimberDemand")

## End(Not run)
```

calcWBGEM *calcWBGEM*

Description

recover world price of commodity in terms of real 2005 USD per metric ton

Usage

```
calcWBGEM()
```

Value

magpie object of time series of world price of commodities

Author(s)

Xiaoxi Wang

See Also

`readSource()`, `readWBGEM()`

Examples

```
## Not run:
calcOutput("WBGEM")

## End(Not run)
```

convertACCMIP *convertACCMIP*

Description

function to convert ACCMIP data to isocountry resolution

Usage

```
convertACCMIP(x)
```

Arguments

x	MAgPIE object

Value

MAgPIE object

Author(s)

Roman Popov, Felicitas Beier

Examples

```
## Not run:
readSource("ACCMIP", subtype = "nhx_1850")

## End(Not run)
```

`convertBodirsky2018` *convertBodirsky2018*

Description

Reads in regression parameters estimated using mrregression, and reads in some scenario based on Bodirsky et al not yet published

Usage

```
convertBodirsky2018(x, subtype)
```

Arguments

`x`	magpie object from read function
`subtype`	bmi_share, demand_regression, intake_regression or bodyheight_regression for the estimated regression paramters of different regressions. scenarios for scenario projections.

Value

magpie object

See Also

`readBodirsky2018()`

convertCEDS2021 *convertCEDS2021*

Description

converts emission data from the CEDS database

Usage

```
convertCEDS2021(x)
```

Arguments

x	magpie object from source function

Value

MAgPIE object

Author(s)

Benjamin Leon Bodirsky, David Klein

convertCEDS2024 *convertCEDS2024*

Description

converts emission data from the CEDS database

Usage

```
convertCEDS2024(x)
```

Arguments

x	magpie object from source function

Value

MAgPIE object

Author(s)

Benjamin Leon Bodirsky, David Klein

convertEEA_EuropeanEnvironmentAgency
Convert European Environment Agency (EEA) data

Description

Read-in European Environment Agency (EEA) data on ETS emissions as magclass object

Usage

```
convertEEA_EuropeanEnvironmentAgency(x, subtype)
```

Arguments

x	MAgPIE object to be converted
subtype	data subtype. Either "ETS", "historical", "projections", or "projections-detailed"

Value

magpie object of European Environment Agency (EEA) ETS emissions (GtCO2)

Author(s)

Renato Rodrigues, Robin Hasse

See Also

readSource

Examples

```
## Not run:
a <- readSource(type = "EEA_EuropeanEnvironmentAgency", subtype = "ETS")

## End(Not run)
```

convertEurostat *Converts Eurostat historical emissions*

Description

Converts Eurostat historical emissions

Usage

```
convertEurostat(x, subtype)
```

Arguments

x	MAgPIE object to be converted
subtype	emissions for original eurostat emissions split, MACCemi for MACC historical emissions, or sectorEmi for sector specific emissions

Value

A MAgPIE object containing the Eurostat historical emissions (MtCO2)

Author(s)

Renato Rodrigues

Examples

```
## Not run:
a <- convertEurostat(x, subtype = "emissions")

## End(Not run)
```

convertEU_ReferenceScenario *Convert EU Reference Scenario*

Description

Converts EU Reference Scenario magpie object into appropriate form for the REMIND model

Usage

```
convertEU_ReferenceScenario(x, subtype)
```

Arguments

x	EU Reference Scenario magpie object derived from readEU_ReferenceScenario function
subtype	data subtype. Either "techAssump.*", "2016" or "2020"

Value

converted EU Reference Scenario magpie object

Author(s)

Renato Rodrigues, Falk Benke, Robin Hasse

Examples

```
## Not run:
test <- readSource("EU_ReferenceScenario", subtype = "2020", convert = TRUE)

## End(Not run)
```

---

convertExpertGuessSSPLivestockProduction *convertExpertGuessSSPLivestockProduction*

Description

convert the Expert Guesses for future Livestock Production for the SSP Scenarios

Usage

```
convertExpertGuessSSPLivestockProduction(x)
```

Arguments

x	MAgPIE-Object contaiing data to convert

Value

magpie object containing converted expert guesses

Author(s)

Stephen Wirth

See Also

readSource()

Examples

```
## Not run:
a <- readSource("ExpertGuessSSPLivestockProduction","ssp1")

## End(Not run)
```

---

convertFeedModel *Convert FeedModel data*

Description

Convert production system distribution and feed basket data to ISO country level.

Usage

```
convertFeedModel(x, subtype = "FeedBaskets")
```

Arguments

x	MAgPIE object containing production system distribution and feed basket data.
subtype	Available subtypes: "ProdSysRatio", "FeedBaskets" and "FeedBasketsDetailed"

Value

Production system distribution and feed basket data as MAgPIE object on ISO country level

Author(s)

Isabelle Weindl, Jan Philipp Dietrich

---

convertGTAPv8v9 *convertGTAPv8v9*

Description

disaggregates country groups from GTAP according to GDP share

Usage

```
convertGTAPv8v9(x, subtype)
```

Arguments

x	unconverted magpie object from read-script
subtype	GTAP header that should be read

Value

Data as MAgPIE object with common country list

Author(s)

Debbora Leip, David M. Chen

Examples

```
## Not run:
a <- readSource("convertGTAPv8v9", "81:SF01", convert = TRUE)

## End(Not run)
```

---

convertHerridge *convertHerridge*

Description

Converts the Data from Herridge et al. to fit the common country list. Source: Herridge D. F., Peoples M. B., Boddey R. M.: Global inputs of biological nitrogen fixation in agricultural systems

Usage

```
convertHerridge(x)
```

Arguments

x	MAgPIE object to be converted

Value

A MAgPIE object containing the share of Nr derived from fixation for each country and each commodity.

Author(s)

Stephen Wirth

Examples

```
## Not run:
x <- readSource("Herridge")

## End(Not run)
```

convertICP2017 *convertICP2017*

Description

converts data of World Bank ICP round, downloaded from here: https://databank.worldbank.org/source/icp-2017 mainly a currency conversion to MER05. Assume that in the original dataset, 2011 values are in 2011MER and 2017 in 2017MER, given the ICP rounds

Usage

```
convertICP2017(x, subtype = "per_cap_expMER")
```

Arguments

x	MAgPIE object containing original values
subtype	data subtype needed. Either "priceLevel", or "per_cap_exp"

Value

magpie object of relative price levels (world = 100) or per capita expenditure (USD17 MER)

Author(s)

David M Chen

Examples

```
## Not run:
a <- convertSource("ICP2017", "per_cap_exp")

## End(Not run)
```

convertIEA *Convert IEA*

Description

Convert IEA energy data to data on ISO country level.

Usage

```
convertIEA(x, subtype)
```

Arguments

x	MAgPIE object containing IEA values at IEA mixed country-region resolution
subtype	data subtype. Either "EnergyBalances", "EnergyBalances-latest", or "Emissions"

Value

IEA data as MAgPIE object aggregated to country level

Author(s)

Anastasis Giannousakis, Renato Rodrigues, Falk Benke

---

convertIEA_EEI *Convert IEA End Uses and Efficiency Indicators data to data on ISO country level.*

Description

Convert IEA End Uses and Efficiency Indicators data to data on ISO country level.

Usage

```
convertIEA_EEI(x)
```

Arguments

x	MAgPIE object to be converted

Author(s)

Falk Benke

---

convertIFA *Convert IFA*

Description

Convert IFADavies (2013) data to ISO country level.

Usage

```
convertIFA(x)
```

Arguments

x	MAgPIE object containing IFA data region resolution

Value

MAgPIE object of the IFA data disaggregated to country level

Author(s)

Lavinia Baumstark

Examples

```
## Not run:
a <- convertIFA(x)

## End(Not run)
```

---

convertImageMacc *Convert subtypes of the ImageMacc data*

Description

Convert subtypes from ImageMacc to data on ISO country level. Correct values for N2O of the subtype "baseline_sources" from N to N2O (factor: 44/28).

Usage

```
convertImageMacc(x, subtype)
```

Arguments

x	MAgPIE object containing ImageMacc data mixed on region level
subtype	data subtype. Either CH4_Energy_Industry", "CH4_Landuse", "N2O_Energy_Industry", "N2O_Landuse", "HFC_tot", "SF6_tot", "PFC_tot" or "baseline_sources"

Value

ImageMacc data as MAgPIE object for all subtypes aggregated to country level

Author(s)

Nele Steinmetz

See Also

readSource()

Examples

```
## Not run:
a <- readSource("ImageMacc", "CH4_Energy_Industry")
a <- readSource("ImageMacc", "CH4_Landuse")
a <- readSource("ImageMacc", "N2O_Energy_Industry")
a <- readSource("ImageMacc", "N2O_Landuse")
a <- readSource("ImageMacc", "HFC_tot")
a <- readSource("ImageMacc", "SF6_tot")
a <- readSource("ImageMacc", "PFC_tot")
a <- readSource("ImageMacc", "baseline_sources")

## End(Not run)
```

---

convertIPCC *Convert subtypes of the IPCC data*

Description

Convert subtypes on ISO country level.

Usage

```
convertIPCC(x, subtype)
```

Arguments

x	MAgPIE object containing IPCC data on region level
subtype	data subtype. Either "awmsShr", "awmsEfCh4", "awmsParCh4", "nExcrRate"

Value

IPCC data as MAgPIE object for all subtypes on country level

Author(s)

Nele Steinmetz

See Also

readSource()

Examples

```
## Not run:
a <- readSource("IPCC", "awmsShr")
a <- readSource("IPCC", "awmsEfCh4")
a <- readSource("IPCC", "awmsParCh4")
a <- readSource("IPCC", "nExcrRate")

## End(Not run)
```

`convertISIMIP` *convertISIMIP*

Description

convert data to ISO country level

Usage

```
convertISIMIP(x, subtype)
```

Arguments

`x`	MAgPIE object on cellular level
`subtype`	data subtype

Value

MAgPIE object on country level

Author(s)

Jan Philipp Dietrich, Felicitas Beier

See Also

`readSource()`

Examples

```
## Not run:
a <- readSource("ISIMIP", convert = TRUE)

## End(Not run)
```

convertJRC_IDEES *Convert JRC IDEES data*

Description

Missing data for EU-28 countries is added, by distributing the difference of EU28 and the sum of country-values based on countries share in EU-28 GDP.

Usage

```
convertJRC_IDEES(x)
```

Arguments

x	A magpie object returned from readJRC_IDEES().

Value

A magpie object.

Author(s)

Michaja Pehl

See Also

readJRC_IDEES()

convertKoeppen *convertKoeppen*

Description

Convert Koeppen climate zones on iso-country level

Usage

```
convertKoeppen(x, subtype = "iso")
```

Arguments

x	magpie object provided by the read function
subtype	Switch between different levels

Value

List of magpie objects with results on country level

Author(s)

Kristine Karstens

Examples

```
## Not run:
readSource("Koeppen", subtype = "iso", convert = TRUE)

## End(Not run)
```

`convertLassaletta2014` *convertLassaletta2014*

Description

converts the dataset of Lassaletta, L., G. Billen, B. Grizzetti, J. Angalde, and J. Garnier. 2014. 50 Year Trends in Nitrogen Use Efficiency of World Cropping Systems: The Relationship between Yield and Nitrogen Input to Cropland. Environmental Research Letters. into a dataset including all countries. Replacing Soviet Union by Russia and Yugoslavia by Serbia without detailed disaggregation.

Usage

```
convertLassaletta2014(x, subtype)
```

Arguments

x	data object that gets provided by wrapper function readSource
subtype	budget provides the nr cropland budgets, fert_to_cropland the share of inorganic fertilizers being applied to croplands

Value

Magpie object with results on country level.

Author(s)

Benjamin Leon Bodirsky

See Also

`readLassaletta2014()`, `readSource()`

Examples

```
## Not run:
readSource("Lassaletta2014", convert = TRUE)

## End(Not run)
```

convertLotzeCampenBiofuel *convertLotzeCampenBiofuel*

Description

Converts the Data from Lotze Campen et al. 2014. to fit the common country list. Source: Lotze Campen et al. 2014. "Impacts of increased bioenergy demand on global food markets: an AgMIP economic model intercomparison" Agricultural Economics 45 (103-116). doi:10.1111/agec.12092.

Usage

```
convertLotzeCampenBiofuel(x)
```

Arguments

x	MAgPIE object to be converted

Value

A MAgPIE object containing future trends in first generation bioenergy demand in Petajoules as magpie object for each country for biodiesel and ethanol.

Author(s)

Ewerton Araujo

Examples

```
## Not run:
x <- readSource("LotzeCampenBiofuel")

## End(Not run)
```

convertLutz2014 *convertLutz2014*

Description

It fills the missing values of the output of readLutz2014 through the weighted average of the values of two countries with similar characteristics to the one that has na values.

Usage

```
convertLutz2014(x)
```

Arguments

x	magpie object provided by the read function

See Also

readLutz2014()

---

convertMAgPIE *Convert MAgPIE data*

Description

Convert MAgPIE data to country-level.

Usage

```
convertMAgPIE(x, subtype)
```

Arguments

x	input MAgPIE data on region-level
subtype	Either "EmiAirPoll", "macBase", "co2tax", "supplyCurve_magpie_40", "abatparam_co2"

Value

magpie object

Author(s)

David Klein, Felix Schreyer

---

convertNCDrisc *convertNCDrisc*

Description

Converts data from the NCD risc consortium body height: Collaboration (NCD-RisC), NCD Risk Factor. 2016. "A Century of Trends in Adult Human Height." ELife 5 (July):e13410. https://doi.org/10.7554/eLife.13410.

Usage

```
convertNCDrisc(x, subtype)
```

Arguments

x	unconverted magpie object from read-script
subtype	"height" for body height data. Missing data is replaced by non-population weighted global average

Value

magpie object with a completed dataset.

See Also

convertNCDrisc()

---

convertPBL_MACC_2019 *Convert subtypes of the PBL_MACC_2019 data*

Description

Convert subtypes from PBL_MACC_2019 to data on ISO country level.#'

Usage

```
convertPBL_MACC_2019(x, subtype)
```

Arguments

x	MAgPIE object containing PBL_MACC_2019 data on region level
subtype	data subtype. "ch4coal","ch4oil","ch4gas","ch4wstl","ch4wsts","ch4rice","ch4animals","ch4anmlwst", "n2otrans","n2oadac","n2onitac","n2ofert","n2oanwst","n2owaste", "HFC_tot", "SF6_tot", "PFC_tot" or "baseline_sources"

Value

PBL_MACC_2019 data as MAgPIE object for all subtypes aggregated to country level

Author(s)

Florian Humpenoeder

See Also

readSource()

convertPBL_MACC_2022 *Convert subtypes of the PBL_MACC_2022 data*

Description

Convert subtypes from PBL_MACC_2022 to data on ISO country level.#'

Usage

```
convertPBL_MACC_2022(x)
```

Arguments

x	MAgPIE object containing PBL_MACC_2022 data on region level

Value

PBL_MACC_2022 data as MAgPIE object for all subtypes aggregated to country level

Author(s)

Michael Windisch, Florian Humpenoeder

See Also

`readSource()`

convertPBL_MACC_SSP2_2022 *Convert subtypes of the PBL_MACC_SSP2_2022 data*

Description

Convert subtypes from PBL_MACC_SSP2_2022 to data on ISO country level.#'

Usage

```
convertPBL_MACC_SSP2_2022(x)
```

Arguments

x	MAgPIE object containing PBL_MACC_SSP2_2022 data on region level

Value

PBL_MACC_SSP2_2022 data as MAgPIE object for all subtypes aggregated to country level

Author(s)

Michael Windisch, Florian Humpenoeder

See Also

readSource()

---

convertPRIMAPhist *convertPRIMAPhist*

Description

function to convert PRIMAP-hist data to isocountry resolution

Usage

```
convertPRIMAPhist(x)
```

Arguments

x	MAgPIE object

Value

MAgPIE object

Author(s)

Roman Popov

Examples

```
## Not run:
readSource("PRIMAPhist", subtype = "hist")

## End(Not run)
```

convertResFor2ndBE *convertResFor2ndBE*

Description

Convert old ReMIND use of residues for 2nd generation bioenergy to country level data

Usage

```
convertResFor2ndBE(x, subtype = subtype)
```

Arguments

x	MAgPIE object containing original values
subtype	oldReMIND, newAgriSupply

Value

List of magpie objects with results on country level

Author(s)

Kristine Karstens

See Also

readSource()

Examples

```
## Not run:
a <- readSource("ResFor2ndBE", subtype = "oldReMIND", convert = TRUE)

## End(Not run)
```

convertSoilGrids *convertSoilGrids*

Description

Convert SoilGrids content

Usage

```
convertSoilGrids(x)
```

Arguments

x	magpie object provided by the read function

Value

List of magpie objects with results on cellular level, weight, unit and description.

Author(s)

Kristine Karstens

See Also

readSoilGrids()

Examples

```
## Not run:
readSource("SoilGrids", subtype = "cstock_0_30", convert = TRUE)

## End(Not run)
```

---

convertSSPResults *convertSSPResults*

Description

Disagregates from SSP regions to ISO countries

Usage

```
convertSSPResults(x)
```

Arguments

x	object coming from read function

Value

MAgPIE object with ISO countries with all indicators for which disaggregation weight was found

Author(s)

Abhijeet Mishra, Benjamin Leon Bodirsky, Florian Humpenoeder

See Also

readSource()

Examples

```
## Not run:
readSource("SSPResults", aggregate = TRUE)

## End(Not run)
```

---

convertVanDrecht2009 *convertVanDrecht2009*

Description

Reads a dataset containing values for sewage

Usage

```
convertVanDrecht2009(x)
```

Arguments

x	MAgPIE object containing incomplete country-region resolution

Value

A MAgPIE object containing sewage quantities and losses

Author(s)

Benjamin Leon Bodirksy

Examples

```
## Not run:
x <- readSource("VanDerWerf2010")

## End(Not run)
```

convertWHO *convertWHO*

Description

Converts data from the WHO

Usage

```
convertWHO(x)
```

Arguments

x	unconverted magpie object from read-script

Value

magpie object with a completed dataset.

See Also

convertWHO()

---

correctAndrijevic2019 *correctAndrijevic2019*

Description

correct Andrijevic governance data

Usage

```
correctAndrijevic2019(x, subtype)
```

Arguments

x	magpie object provided by the read function
subtype	data to be returned: "historical" for observed data until 2015 "projected" for projected SSP scenario data from 2015 to 2099

Value

corrected magpie object iso-level

Author(s)

Felicitas Beier

See Also

readAndrijevic2019()

`correctEDGARfood` *correctEDGARfood*

Description

correct Edgar-food data

Usage

```
correctEDGARfood(x, subtype)
```

Arguments

`x`	magpie object provided by the read function
`subtype`	Type of data that should be read • `foodSystemEmi`: Total food system emissions of different countries • `foodSystemShare`: Share of food system emissions in total emissions • `foodSystemSector`: Food system emissions separated by country, sector and substance

Value

corrected magpie object

Author(s)

David Hoetten

See Also

readEDGARfood

correctFoodSystemsDashboard *correctFoodSystemsDashboard*

Description

Correct FoodSystemsDashboard values that are questionable

Usage

```
correctFoodSystemsDashboard(x, subtype)
```

Arguments

x	magpie object provided by the read function
subtype	Switch between different levels

Value

List of magpie objects

Author(s)

David Chen

correctIPCCClimate *correctIPCCClimate*

Description

Correct IPCC climate classification

Usage

```
correctIPCCClimate(x)
```

Arguments

x	magpie object provided by the read function

Value

Magpie object with results on cellular level for 12 IPCC climate zone types

Author(s)

Kristine Karstens

Examples

```
## Not run:
readSource("IPCCClimate", convert = "onlycorrect")

## End(Not run)
```

`correctKoeppen` *correctKoeppen*

Description

Correct Koeppen climate zones on cellular level

Usage

```
correctKoeppen(x, subtype = "iso")
```

Arguments

`x`	magpie object provided by the read function
`subtype`	Switch between different levels

Value

List of magpie objects with results on cellular level

Author(s)

Kristine Karstens

Examples

```
## Not run:
readSource("Koeppen", subtype = "cellular", convert = "onlycorrect")

## End(Not run)
```

correctSoilGrids *correctSoilGrids*

Description

Correct SoilGrids content

Usage

```
correctSoilGrids(x)
```

Arguments

x	magpie object provided by the read function

Value

List of magpie objects with results on cellular level, weight, unit and description.

Author(s)

Kristine Karstens

See Also

readSoilGrids()

Examples

```
## Not run:
readSource("SoilGrids", subtype = "cstock_0_30", convert = "onlycorrect")

## End(Not run)
```

correctTNC2019 *correctTNC2019*

Description

correct biome data

Usage

```
correctTNC2019(x)
```

Arguments

x	magpie object provided by the read function

Value

magpie object on cellular level

Author(s)

Patrick v. Jeetze

See Also

readTNC2019

Examples

```
## Not run:
readSource("TNC2019", convert = "onlycorrect")

## End(Not run)
```

`downloadAndrijevic2019` *downloadAndrijevic2019*

Description

This function downloads the governance indicator data available at https://github.com/marina-andrijevic/governance2019

Usage

```
downloadAndrijevic2019(subtype = "governance_obs_project")
```

Arguments

subtype	file that should be downloaded from governance2019 repository

Author(s)

Felicitas Beier

See Also

readAndrijevic2019()

Examples

```
## Not run:
downloadSource("Andrijevic2019", subtype = "governance_obs_project")

## End(Not run)
```

downloadEDGAR6 *downloadEDGAR*

Description

download EDGAR emission data

Usage

```
downloadEDGAR6(subtype = "n2o")
```

Arguments

subtype	type in gas for receiving the newest data. type in specific filename for old version 4.31 data

Value

List of magpie objects with results on cellular level, weight, unit and description.

Author(s)

Benjamin Leon Bodirsky

downloadEDGARfood *downloadEDGARfood*

Description

download Edgar-food v6 food system emission data

Usage

```
downloadEDGARfood()
```

Author(s)

David Hötten

downloadEurostatLivestock *Download Eurostat Livestock Data*

Description

Downloads the latest data and meta data form the Eurostat website.

Usage

```
downloadEurostatLivestock(subtype)
```

Arguments

subtype	Type of Eurostat Livestock data that should be read.

downloadGFED *Download GFED*

Description

Download the GFED (Global Fire Emissions Database) dataset for all years not labeled as beta, in addition to the emission factors.

Usage

```
downloadGFED()
```

Author(s)

Michael S. Crawford

See Also

downloadSource() readGFED()

Examples

```
## Not run:
a <- downloadSource()

## End(Not run)
```

downloadGGCMICropCalendar *downloadGGCMICropCalendar*

Description

Download ISIMIP GGCMI crop calendar information and harvest area masks

Usage

```
downloadGGCMICropCalendar()
```

Author(s)

David M Chen, Edna Molina Bacca

downloadIPCCClimate *downloadIPCCClimate*

Description

Download IPCC climate classification

Usage

```
downloadIPCCClimate()
```

Value

Meta information on downloaded data

Author(s)

Kristine Karstens

Examples

```
## Not run:
readSource("IPCCClimate", convert="onlycorrect")

## End(Not run)
```

downloadISIMIP *Download ISIMIP data*

Description

Downloads the latest data from ISIMIP.

Usage

```
downloadISIMIP(subtype)
```

Arguments

subtype	Type of ISIMIP data that should be read. It consists of variable ("airrww"), model ("cwatm","h08","lpjml","matsiro","mpi-hm","pcr-globwb"), GCM ("ipsl-cm5a-lr","gfdl-esm2m","miroc5","hadgem2-es") and database version ("2a","2b","3a","3b"), separated by ":" (e.g. "airww:LPJmL:gfdl-esm2m:2b"). Similarly for ISIMIP GGCMI phase3b data, with scenarios and CO2 fert setting, downloads for all crops and irrigation settings models ("LPJmL", "EPIC-IIASA", "pDSSAT", "CYGMA1p74"), gcms ("gfdl-esm4", "ipsl-cm6a-lr", "mpi-esm1-2-hr", "mri-esm2-0", "ukesm1-0-ll"), scenarios ("historical", "ssp126", "ssp370", "ssp585"), co2 ("default", "2015co2"), version c("2a","2b","3a","3b"))) Example of yield subtype : "yields:EPIC-IIASA:ukesm1-0-ll:ssp585:default:3b"

Author(s)

Jan Philipp Dietrich

downloadNitrogenBoundariesGridded *downloadNitrogenBoundariesGridded*

Description

Download he grid-level regional nitrogen boundary datasets from Schulte-Uebbing et al. (2022)

Usage

```
downloadNitrogenBoundariesGridded()
```

Author(s)

Michael S. Crawford

See Also

downloadSource()

Examples

```
## Not run:
 a <- downloadSource("NitrogenBoundariesGridded")

## End(Not run)
```

`downloadSoilGrids` *downloadSoilGrids*

Description

This function downloads the raw SoilGrids data (available at https://files.isric.org/soilgrids/data/recent) or, if available, the preprocessed raster layers.

Usage

```
downloadSoilGrids(subtype = "cstock_0_30")
```

Arguments

`subtype`	Switch between different input. Use predefined ones or any FileName specified in 'SoilGrids/META_GEOTIFF_1B.csv'

Value

magpie object in cellular resolution

Author(s)

Kristine Karstens

See Also

`readSoilGrids()`

Examples

```
## Not run:
downloadSource("SoilGrids", subtype = "carbon0_30")

## End(Not run)
```

downloadUN_PopDiv *Download UN_PopDiv*

Description

Download UN_PopDiv dataset (World Population Prospects)

Usage

```
downloadUN_PopDiv()
```

Author(s)

Michael Crawford, Debbora Leip

See Also

downloadSource() readUN_PopDiv()

Examples

```
## Not run:
a <- downloadSource()

## End(Not run)
```

readACCMIP *readACCMIP*

Description

Read in data from the Atmospheric Chemistry and Climate Model Intercomparison Project

Usage

```
readACCMIP(subtype = NULL)
```

Arguments

subtype	data subtype. available subtypes are: • nhx_1850 • noy_1850 • sox_1850 • nhx_1980 • noy_1980

- sox_1980
- nhx_2000
- noy_2000
- sox_2000
- nhx_26_2030
- nhx_45_2030
- nhx_85_2030
- noy_26_2030
- noy_45_2030
- noy_85_2030
- sox_26_2030
- sox_45_2030
- sox_85_2030
- nhx_26_2100
- nhx_45_2100
- nhx_85_2100
- noy_26_2100
- noy_45_2100
- noy_85_2100
- sox_26_2100
- sox_45_2100
- sox_85_2100

Value

magpie object of the ACCMIP data. Unit is t NO2-N per ha per year, or t NH3-N per ha per year,...

Author(s)

Roman Popov

See Also

readSource()

Examples

```
## Not run:
a <- readACCMIP("ACCMIP", "nhx_2000")
a <- readACCMIP("ACCMIP", "sox_26_2030")

## End(Not run)
```

readAdjustGrassi2021 *readAdjustGrassi2021*

Description

Read in data from Grassi et al. 2021. Adjustement factors for emission in GtCO2 yr-1.

Usage

```
readAdjustGrassi2021(subtype)
```

Arguments

subtype	Either "data" or "weight"

Value

Adjustement factors or weight as MAgPIE object

Author(s)

Michael Windisch, Florian Humpenoeder

Examples

```
## Not run:
readSource("AdjustGrassi2021", subtype = "data")

## End(Not run)
```

readAndrijevic2019 *readAndrijevic2019*

Description

read in governance index data from Andrijevic et al. 2019

Usage

```
readAndrijevic2019(subtype)
```

Arguments

subtype	data used from governance2019 repository

Value

governance index data at iso-country level

Author(s)

Felicitas Beier

See Also

readSource()

Examples

```
## Not run:
a <- readSource("Andrijevic2019")

## End(Not run)
```

`readBodirsky2018` *readBodirsky2018*

Description

Reads in regression parameters estimated using mrregression, and reads in some scenario based on Bodirsky et al not yet published

Usage

```
readBodirsky2018(subtype = "bmi_shr")
```

Arguments

`subtype`	bmi_share, demand_regression, intake_regression or bodyheight_regression for the estimated regression paramters of different regressions. scenarios for scenario projections.

Value

magpie object

See Also

readNCDrisc()

readCarbonLTS *readCarbonLTS*

Description

Read-in an Long term carbon storage data for historical period.

Usage

```
readCarbonLTS(subtype)
```

Arguments

subtype	data subtype.

Value

magpie object of the FRA 2015 data

Author(s)

Abhijeet Mishra

See Also

readSource()

Examples

```
## Not run:
a <- readSource("CarbonLTS", "Lauk_et_al")

## End(Not run)
```

readCEDS2021 *readCEDS2021*

Description

reads in emission data from the CEDS database

Usage

```
readCEDS2021()
```

Value

MAgPIE object

Author(s)

Benjamin Leon Bodirsky, David Klein

`readCEDS2024` *readCEDS2024*

Description

reads in emission data from the CEDS database

Usage

```
readCEDS2024()
```

Value

MAgPIE object

Author(s)

Pascal Weigmann

`readEDGAR6` *readEDGAR6*

Description

download EDGAR 5 and 6 emission data

Usage

```
readEDGAR6(subtype)
```

Arguments

`subtype`	type in gas

Value

List of magpie objects with results on country level, weight, unit and description.

Author(s)

Benjamin Leon Bodirsky, Michael S. Crawford

readEDGAR8 *readEDGAR8*

Description

read EDGAR 8 emission data

Usage

```
readEDGAR8()
```

Value

magpie objects of EDGAR historical emissions (MtCO2eq)

Author(s)

Pascal Weigmann

See Also

readSource

readEDGARfood *readEDGARfood*

Description

read Edgar-food v6 food system emission data

Usage

```
readEDGARfood(subtype)
```

Arguments

subtype	Type of data that should be read • foodSystemEmi: Total food system emissions of different countries • foodSystemShare: Share of food system emissions in total emissions • foodSystemSector: Food system emissions separated by country, sector and substance

Value

A magpie object with foodsystem total emissions, emission shares or sector and substance specific emission, depending on subtype

Author(s)

David Hötten

`readEDGAR_LU` *Read EDGAR_LU*

Description

Read-in EDGAR_LU csv file as magclass object

Usage

```
readEDGAR_LU(subtype = "CO2")
```

Arguments

`subtype`	emission type

Value

magpie object EDGAR_LU data

Author(s)

Florian Humpenoeder

See Also

`readSource()`

Examples

```
## Not run:
a <- readSource(type = "EDGAR_LU")

## End(Not run)
```

readEEA_EuropeanEnvironmentAgency *Read European Environment Agency (EEA) data*

Description

Read-in European Environment Agency (EEA) data on ETS emissions as magclass object

Usage

```
readEEA_EuropeanEnvironmentAgency(subtype)
```

Arguments

subtype	data subtype. Either "ETS", "ESR", "total", "sectoral", "projections", or "projections-detailed"

Value

magpie object of European Environment Agency (EEA) ETS emissions (GtCO2)

Author(s)

Renato Rodrigues, Falk Benke, Robin Hasse

See Also

readSource

Examples

```
## Not run:
a <- readSource(type = "EEA_EuropeanEnvironmentAgency", subtype = "ETS")

## End(Not run)
```

readEurostat *Read Eurostat historical emissions*

Description

Read-in Eurostat historical emissions csv files as magclass object

Usage

```
readEurostat(subtype = "emissions")
```

Arguments

subtype	emissions for original eurostat emissions split, MACCemi for MACC historical emissions, or sectorEmi for sector specific emissions

Value

magpie object of Eurostat historical emissions (MtCO2)

Author(s)

Renato Rodrigues

See Also

readSource

Examples

```
## Not run:
a <- readSource(type = "Eurostat", subtype = "emissions")

## End(Not run)
```

readEurostatLivestock *Read EUROSTAT_livestock*

Description

Read in EUROSTAT livestock data

Usage

```
readEurostatLivestock(subtype)
```

Arguments

subtype	Type of FAO data that should be read. Available types are: • EggPopProd : Production of eggs for consumption and number of laying hens • LayingHensPop : Laying hens population - annual data • PoultryPop : Poultry - annual data • PigPop : Pig population - annual data • BovinePop : Bovine population - annual data • Nuts2Pop : Animal populations by NUTS 2 regions • MeatProd : Meat production and foreign trade - head - monthly data • MilkNuts2Prod : Production of cow's milk on farms by NUTS 2 regions • MilkProd : Production and utilization of milk on the farm - annual data

Value

EUROSTAT livestock data as MAgPIE object

Author(s)

David Hötten

See Also

readSource()

Examples

```
## Not run:
a <- readSource("EurostatLivestock", "MeatProd")

## End(Not run)
```

---

readEU_ReferenceScenario

Read EU Reference Scenario

Description

Read EU Reference Scenario .xlsx file as magpie object

Usage

```
readEU_ReferenceScenario(subtype)
```

Arguments

subtype	data subtype. Either "techAssump.*", "2016" or "2020"

Value

magpie object of EU reference scenario data by country. Units follow REMIND report conventions and conversion factor is defined in EU_ReferenceScenario2REMIND.xlsx file.

Author(s)

Renato Rodrigues, Falk Benke, Robin Hasse

Examples

```
## Not run:
test <- readSource("EU_ReferenceScenario", subtype = "2020", convert = FALSE)

## End(Not run)
```

---

readExpertGuessSSPLivestockProduction
readExpertGuessSSPLivestockProduction

Description

Read the Expert Guesses for future Livestock Production for the SSP Scenarios

Usage

```
readExpertGuessSSPLivestockProduction(subtype)
```

Arguments

subtype	: Available subtypes are: ssp1 to 5 Data for the SSP Scenario

Value

magpie object containing the expert guesses

Author(s)

Stephen Wirth

See Also

readSource()

Examples

```
## Not run:
a <- readSource("ExpertGuessSSPLivestockProduction","ssp1")

## End(Not run)
```

readFeedEfficiencyReg *Read in regression coefficients for feed efficiency*

Description

Read in csv file containing coefficients of non-linear regression analysis for the calculation of future feed efficiencies of feed baskets dependent on livestock productivity trends

Usage

```
readFeedEfficiencyReg()
```

Value

MAgPIE object containing regression coefficients

Author(s)

Isabelle Weindl

See Also

readSource()

Examples

```
## Not run:
a <- readSource("FeedEfficiencyReg")

## End(Not run)
```

readFeedModel *Read in data of FeedModel*

Description

Read in csv files containing data on production system distribution and system-specific feed baskets from the FeedModel "MAgPIE_FEED"

Usage

```
readFeedModel(subtype = "FeedBaskets")
```

Arguments

subtype	Available subtypes: "ProdSysRatio", "FeedBaskets" and "FeedBasketsDetailed"

Value

magpie object of feed basket data

Author(s)

Isabelle Weindl

See Also

readSource()

Examples

```
## Not run:
a <- readSource(type = "FeedModel", subtype = "FeedBaskets")

## End(Not run)
```

---

readFeedShareReg *Read in regression coefficients for central feed shares*

Description

Read in csv file containing coefficients of non-linear regression analysis for the calculation of future central feed shares in feed baskets dependent on livestock productivity trends

Usage

```
readFeedShareReg()
```

Value

MAgPIE object containing regression coefficients

Author(s)

Isabelle Weindl

See Also

readSource()

Examples

```
## Not run:
a <- readSource("FeedShareReg")

## End(Not run)
```

readFoodSystemsDashboard *readFoodSystemsDashboard*

Description

read in Food Systems Dashboard indicators

Usage

```
readFoodSystemsDashboard(subtype)
```

Arguments

subtype	Currently either "Processed" for Processed food expenditures per capita or "Industrial Processing Share"

Value

governance index data at iso-country level

Author(s)

David Chen

See Also

readSource()

Examples

```
## Not run:
a <- readSource("FoodSystemsDashboard")

## End(Not run)
```

readFroehle *Read parameters of Froehle equations*

Description

Publication Froehle, Andrew W. 2008 "Climate Variables as Predictors of Basal Metabolic Rate: New Equations" American Journal of Human Biology: The Official Journal of the Human Biology Council 20 (5): 510-29. doi: 10.1002/ajhb.20769.

Usage

```
readFroehle()
```

Value

MAgPIE object

Author(s)

Benjamin Bodirsky

See Also

`readSource()`

Examples

```
## Not run:
a <- readSource("Froehle")

## End(Not run)
```

readGFED *Read GFED*

Description

Read the Global Fire Emissions Database over the available years and store them in a MAgPIE object with two sub-dimensions: Species (e.g. DM, CO2, CH4, or N2O), and Partition (e.g. SAVA, BORF, TEMF, DEFO, PEAT, AGRI). Emissions are reported in Mt X. For more information, see: https://globalfiredata.org/pages/data/. Due to runtime considerations, this function only calculates a small sample of the total emissions (CH4, N2O, NOx, NH3) and burning partitions (AGRI), which are currently being used for validation.

Usage

```
readGFED()
```

Value

A MAgPIE object with the GFED emissions data and sub-dimensions Partition and Species.

Author(s)

Michael S. Crawford

See Also

readSource()

Examples

```
## Not run:
a <- readSource("GFED")

## End(Not run)
```

---

readGGCMICropCalendar *readGGCMICropCalendar*

Description

Reads in GGCMI fraction of Harvested Area masks for rice 1 and rice 2 (other crops available too, see path in download function), or other variables available in the GGCMI crop calendar.

Usage

```
readGGCMICropCalendar(subtype = "fraction_of_harvested_area")
```

Arguments

subtype	variable or vector of variables to read from the crop calendar set. Options: ("planting_day","maturity_day","fraction_of_harvested_area","cal" (which is a combination of planting_day, maturity_day and harvest_day)), wheat areas and rice_areas

Value

MAgPIE object with the requested data

Author(s)

David M Chen, Edna Molina Bacca

readGTAPv8v9 *readGTAPv8v9*

Description

Read in data from GTAP 8.1 baseyears 2007 and 2004. All values in mio. current US$MER.

Usage

```
readGTAPv8v9(subtype)
```

Arguments

subtype	GTAP version and header that should be read. Available versions are "81" and "9" Available headers are listed in the contents_xxx.csv in the GTAPv8v9 source folder for each GTAP file (BaseData.har, BaseRate.har, BaseView.har, CO2.har, gsdvole.har, GTAPSam.har, Sets.har, TStrade.har, and Default.prm - file is determined based on the header via a mapping and does not need to be specified).

Value

GTAP data as MAgPIE object

Author(s)

Debbora Leip, David M. Chen

Examples

```
## Not run:
readSource("GTAPv8v9", subtype = "81:SF01")

## End(Not run)
```

readHerridge *readHerridge*

Description

Reads a dataset containing values for biological nitrogen fixation in agricultural systems. Source: Herridge D. F., Peoples M. B., Boddey R. M.: Global inputs of biological nitrogen fixation in agricultural systems

Usage

```
readHerridge(subtype = NULL)
```

Arguments

subtype	a subtype for the calculation

Details

Availables Subtypes:

- ndfa: National values for Plant associated fixation
- freeliving: Global values for free living agents

Value

A MAgPIE object containting the share of Nr derived from

- ndfa: fixation for each country and each commodity.
- freeliving: fixation by free living agents

Author(s)

Stephen Wirth, Jan Philipp Dietrich

Examples

```
## Not run:
x <- readSource("Herridge", "ndfa")
x <- readSource("Herridge", "freeliving", convert = F)

## End(Not run)
```

---

readHHS_USDA *readHHS_USDA*

Description

reads calory requirement for a standardized population from HHS & USDA. 2015. "2015-2020 Dietary Guidelines for Americans." 8. Dietary Guidelines for Americans. https://health.gov/dietaryguidelines/2015/resources/2020_Dietary_Guidelines.pdf. Appendix 2

Usage

```
readHHS_USDA()
```

Value

Magpie object with results on global level.

Author(s)

Benjamin Leon Bodirsky

See Also

convertLassaletta2014(), readSource()

---

readHI *Read allometric coeffizients for residue to harvest translation*

Description

Read-in a file containing the allometric coeffizients of MAgPIE crop types. Values are assembled from various literature sources, and the weighting and allocation is done in the spreadsheet crop_specifications_*.ods for different versions of the file

Usage

```
readHI()
```

Value

magpie object with the dimension crops and coeffizients

Author(s)

Benjamin Leon Bodrisky, Kristine Karstens

See Also

readSource()

Examples

```
## Not run:
a <- readSource("HI")

## End(Not run)
```

readHoulton2018 *readHoulton2018*

Description

Read Houlton 2018 model on weathering of N from rocks

Usage

```
readHoulton2018()
```

Value

magpie object global resolution by landuse types in Mt of N weathered from rocks each year

Author(s)

David M Chen

Examples

```
## Not run:
readSource("Houlton2018", convert = FALSE)

## End(Not run)
```

readICP2017 *readICP2017*

Description

Reads data of World Bank ICP round, downloaded from here: https://databank.worldbank.org/source/icp-2017

Usage

```
readICP2017(subtype = "per_cap_expMER")
```

Arguments

subtype	data subtype to be read in. Available subtypes are: • priceLevel Price level index (World = 100) • expRatio Expenditure component share of GDP (GDP = 100%) • exp_LCU Expenditure (local currency units, billions) • exp_MER Expenditure, market exchange rate-based (US$, billions) • exp_PPP Expenditure, PPP-based (US$, billions) • per_cap_expPPP Expenditure per capita, PPP-based (US$) • per_cap_expMER Expenditure per capita, market exchange rate-based (US$)

Value

magpie object of relative price levels (world = 100) or per capita expenditure (USD17 MER)

Author(s)

David M Chen

Examples

```
## Not run:
a <- readSource("ICP2017", "per_cap_exp")

## End(Not run)
```

---

readIEA *Read IEA*

Description

Read-in an IEA csv file as magpie object

Usage

```
readIEA(subtype)
```

Arguments

subtype	data subtype. Either "EnergyBalances", "EnergyBalances-2023", or "Emissions". • "EnergyBalances": IEA energy balances until 2020 (incomplete 2021), data updated in Aug 2022, the current default for REMIND input data • "EnergyBalances-latest": IEA energy balances until 2022 (2023 incomplete), data updated in Sep 2024, currently used for comparisons only

Value

magpie object of the IEA

Author(s)

Anastasis Giannousakis, Lavinia Baumstark, Renato Rodrigues, Falk Benke

See Also

readSource()

Examples

```
## Not run:
a <- readSource(type = "IEA", subtype = "EnergyBalances")

## End(Not run)
```

`readIEA_EEI` *Read-in data from IEA End Uses and Efficiency Indicators Database*

Description

Read-in data from IEA End Uses and Efficiency Indicators Database

Usage

```
readIEA_EEI()
```

Author(s)

Falk Benke

`readIFA` *Read IFA*

Description

Read-in IFA (International Fertilizer Association) data .xlsx file as magclass object

Usage

```
readIFA(subtype)
```

Arguments

`subtype`	Type of IFA data that should be read. Available types are: • `consumption`: read in fertilizer_consumption.xlsx data • `production`: read in fertilizer_production.xlsx data

Value

magpie object of the IFA data

Author(s)

Lavinia Baumstark

See Also

readSource()

Examples

```
## Not run:
a <- readSource(type = "IFA", subtype = "consumption")

## End(Not run)
```

---

readIfBB *readIfBB*

Description

reads data on historic bioplastic production from csv source: "Biopolymers facts and statistics 2021" page 58, Institute for Bioplastics and Biocomposites (IfBB)

Usage

```
readIfBB()
```

Value

data as MAgPIE object

Author(s)

Debbora Leip

Examples

```
## Not run:
  readSource("HistBioplasticProd")

## End(Not run)
```

readImageMacc *Read in ImageMacc Costcurves for different subtypes*

Description

Read in ImageMacc Costcurves for different subtypes. Rows are removed, the dataframe is reshaped and numbers are replaced by descriptions.

Usage

```
readImageMacc(subtype)
```

Arguments

subtype	data subtype. Options are: "CH4_Energy_Industry", "CH4_Landuse", "N2O_Energy_Industry", "N2O_Landuse", "HFC_tot", "SF6_tot", "PFC_tot" or "baseline_sources"

Value

magpie object of the ImageMacc data

Author(s)

Nele Steinmetz

See Also

readSource()

Examples

```
## Not run:
a <- readSource("ImageMacc", "CH4_Energy_Industry")
a <- readSource("ImageMacc", "CH4_Landuse")
a <- readSource("ImageMacc", "N2O_Energy_Industry")
a <- readSource("ImageMacc", "N2O_Landuse")
a <- readSource("ImageMacc", "HFC_tot")
a <- readSource("ImageMacc", "SF6_tot")
a <- readSource("ImageMacc", "PFC_tot")
a <- readSource("ImageMacc", "baseline_sources")

## End(Not run)
```

readIMPACT3.2.2World_Price *Read IMPACT3.2.2World_Price*

Description

Read-in world prices data csv file as magclass object

Usage

```
readIMPACT3.2.2World_Price()
```

Value

magpie object of the world prices from the IMPACT model for different SSP scenarios

Author(s)

Mishko Stevanovic

See Also

readSource()

Examples

```
## Not run:
a <- readSource(type = "IMPACT3.2.2World_Price")

## End(Not run)
```

readIPCC *Read in IPCC emissions*

Description

Read in IPCC data:

- Read in IPCC emissions from livestock and manure management. Source: IPCC Guidelines for National Greenhouse Gas Inventories (2006); Chapter 10: Emissions from Livestock and Manure Management.
- Read in IPCC emissions from Lime and urea application. Source: IPCC Guidelines for National Greenhouse Gas Inventories (2006); Chapter 11: N2O Emissions from managed Soils and Co2 Emissions from Lime and Urea Application.

- Read in IPCC efficiency factors for burning of residue. Source: IPCC Guidelines for National Greenhouse Gas Inventories (2006); Chapter 02: Generic Methodologies applicable to multiple Land-use Categories.
- Read in soil related stock change factors for carbon and manure parameterization. Source: IPCC Guidelines for National Greenhouse Gas Inventories (2006); Chapter 5: Cropland.

Usage

```
readIPCC(subtype)
```

Arguments

subtype	data subtype

Value

magpie object of the IPCC data

Author(s)

Nele Steinmetz, Stephen Wirth, Jan Philipp Dietrich, Kristine Karstens

See Also

readSource()

Examples

```
## Not run:
a <- readSource("IPCC", "awmsShr")
a <- readSource("IPCC", "awmsEfCh4")
a <- readSource("IPCC", "awmsParCh4")
a <- readSource("IPCC", "nExcrRate")
a <- readSource("IPCC", "awmsconfef3", convert = FALSE)
a <- readSource("IPCC", "fracgasms", convert = FALSE)
a <- readSource("IPCC", "fraclossms", convert = FALSE)
a <- readSource("IPCC", "emissionfactors", convert = FALSE)
a <- readSource("IPCC", "rescombusteff", convert = FALSE)
a <- readSource("IPCC", "efnsoil", convert = FALSE)

## End(Not run)
```

readIPCCClimate *readIPCCClimate*

Description

Read IPCC climate classification

Usage

```
readIPCCClimate()
```

Value

Magpie object with results on cellular level for 12 IPCC climate zone types

Author(s)

Kristine Karstens

Examples

```
## Not run:
readSource("IPCCClimate", convert = "onlycorrect")

## End(Not run)
```

readISIMIP *readISIMIP*

Description

Reads in ISIMIP data

Usage

```
readISIMIP(subtype = "airww:LPJmL:gfdl-esm2m:2b")
```

Arguments

subtype	Type of ISIMIP data that should be read. It consists of variable ("airrww"), model ("cwatm","h08","lpjml","matsiro","mpi-hm","pcr-globwb"), GCM ("ipsl-cm5a-lr","gfdl-esm2m","miroc5","hadgem2-es") and database version ("2a","2b","3a","3b"), separated by ":" (e.g. "airww:LPJmL:gfdl-esm2m:2b") Similaryly for ISIMIP GGCMI phase3b data, with scenarios and CO2 fert setting, downloads for all crops and irrigation settings models ("LPJmL", "EPIC-IIASA", "pDSSAT", "CYGMA1p74"), gcms ("gfdl-esm4", "ipsl-cm6a-lr", "mpi-esm1-2-hr", "mri-esm2-0", "ukesm1-0-ll"), scenarios ("historical", "ssp126", "ssp370", "ssp585"), co2 ("default", "2015co2"), version c("2a","2b","3a","3b"))) Example of yield subtype : "yields:EPIC-IIASA:ukesm1-0-ll:ssp585:default:3b"

Value

MAgPIE object with the requested data

Note

Values for years before 1961 will be ignored to reduce overall object size

Author(s)

Jan Philipp Dietrich, Felicitas Beier, David Chen

Examples

```
## Not run:
readSource("ISIMIP", convert = TRUE)

## End(Not run)
```

---

readJRC_IDEES *Read JRC IDEES*

Description

Read the IDEES data base from JRC #nolint

Usage

```
readJRC_IDEES(subtype)
```

Arguments

subtype	one of • 'Emission': read worksheets from the Emission Balance files • 'Energy': read worksheets from the Energy Balance files • 'Industry': read worksheets from the Industry files • 'Transport': read worksheets from the Transport files • 'MBunkers': read worksheets from the Bunkers files • 'Residential': read worksheets from the Residential files • 'Tertiary': read worksheets from the Tertiary (Services and Agriculture) files

Value

A magpie object.

Author(s)

Michaja Pehl, Falk Benke

See Also

readSource()

---

readKoeppen *readKoeppen*

Description

Read Koeppen climate zones on iso-country and cellular level

Usage

```
readKoeppen(subtype = "iso")
```

Arguments

subtype	Switch between different levels

Value

List of magpie objects with results on country or cellular level

Author(s)

Kristine Karstens

Examples

```
## Not run:
readSource("Koeppen", subtype = "iso")

## End(Not run)
```

readLassaletta2014 *readLassaletta2014*

Description

reads nitrogen budgets for a country dataset from Lassaletta, L., G. Billen, B. Grizzetti, J. Angalde, and J. Garnier. 2014. 50 Year Trends in Nitrogen Use Efficiency of World Cropping Systems: The Relationship between Yield and Nitrogen Input to Cropland. Environmental Research Letters.

Usage

```
readLassaletta2014(subtype = "budget")
```

Arguments

subtype	budget provides the nr cropland budgets, fert_to_cropland the sahre of inorganic fertilizers being applied to croplands

Value

Magpie object with results on country level.

Author(s)

Benjamin Leon Bodirsky, Felicitas Beier

See Also

convertLassaletta2014(), readSource()

Examples

```
## Not run:
readSource("Lassaletta2014", subtype = "budget", convert = FALSE)

## End(Not run)
```

readLotzeCampenBiofuel *Read LotzeCampenBiofuel*

Description

Read-in Future trends in first generation bioenergy demand from the publication Lotze Campen et al. 2014. "Impacts of increased bioenergy demand on global food markets: an AgMIP economic model intercomparison" Agricultural Economics 45 (103-116). doi:10.1111/agec.12092. from a .csv file to a magclass object

Usage

```
readLotzeCampenBiofuel()
```

Value

Future trends in first generation bioenergy demand in ExaJoule as magpie object

Author(s)

Ewerton Araujo

See Also

readSource()

Examples

```
## Not run:
a <- readSource("LotzeCampenBiofuel")

## End(Not run)
```

readLutz2014 *readLutz2014*

Description

It reads and clears the dataset of the global population projections by age, sex and education, available on the Wittgenstein Centre Data Explorer and published by Lutz, Butz and K. C. , 2014. "Population and human capital in the twenty-first century" Oxford University Press. From .csv file to a magclass object

Usage

```
readLutz2014()
```

Value

magpie object with the dataset downloaded. It contains missing values and it is possible to replace them with the function convertLutz2014.

See Also

convertLutz2014()

---

readMAgPIE *Read MAgPIE data*

Description

Read-in MAgPIE data

Usage

```
readMAgPIE(subtype)
```

Arguments

subtype	Either "EmiAirPoll", "macBase" or "co2tax"

Value

magpie object

Author(s)

Julian Oeser

See Also

readSource()

Examples

```
## Not run:
a <- readSource(type = "MAgPIE", subtype = "EmiAPExo")

## End(Not run)
```

readNCDrisc *readNCDrisc*

Description

Reads in data from the NCD risc consortium body height: Collaboration (NCD-RisC), NCD Risk Factor. 2016. "A Century of Trends in Adult Human Height." ELife 5 (July):e13410. https://doi.org/10.7554/eLife.13410.

Usage

```
readNCDrisc(subtype)
```

Arguments

subtype	"height" for body height data

Value

magpie object with the dataset downloaded. It contains missing values and it is possible to replace them with the function convertNCDrisc

Author(s)

Benjamin Leon Bodirsky

See Also

convertNCDrisc()

readNitrogenBoundariesGridded *readNitrogenBoundariesGridded*

Description

Read the grid-level regional nitrogen boundary datasets from Schulte-Uebbing et al. (2022). For the moment, this only uses the critical N surplus in all agricultural land (arable + intensively managed grassland) in view of all thresholds simultaneously, measured in kg N per ha per yr.

Usage

```
readNitrogenBoundariesGridded()
```

Value

A MAgPIE object with the critical nitrogen surplus in kg N per ha per yr in 2010

Author(s)

Michael S. Crawford

See Also

readSource()

Examples

```
## Not run:
 a <- readSource("NitrogenBoundariesGridded")

## End(Not run)
```

---

readPBL_MACC_2019 *Read in PBL MAC curves from Harmsen_et_al_2019 for different subtypes*

Description

Read in PBL MAC curves from Harmsen_et_al_2019 for different subtypes

Usage

```
readPBL_MACC_2019(subtype)
```

Arguments

subtype	data subtype. "ch4coal","ch4oil","ch4gas","ch4wstl","ch4wsts","ch4rice","ch4animals","ch4anmlwst", "n2otrans","n2oadac","n2onitac","n2ofert","n2oanwst","n2owaste", "HFC_tot", "SF6_tot", "PFC_tot" or "baseline_sources"

Value

magpie object of the PBL_MACC_2019 data

Author(s)

Florian Humpenoeder

See Also

readSource()

readPBL_MACC_2022 *Read in PBL MAC curves from Harmsen_et_al_2022 for different subtypes and subsets*

Description

Read in PBL MAC curves from Harmsen_et_al_2022 for different subtypes and subsets

Usage

```
readPBL_MACC_2022(subtype, subset)
```

Arguments

subtype	data subtype. "ch4coal","ch4oil","ch4gas","ch4wstl","ch4wsts","ch4rice","ch4animals","ch4anmlwst", "n2otrans","n2oadac","n2onitac","n2ofert","n2oanwst","n2owaste"
subset	data subset. "Default", "Optimistic", "Pessimistic"

Value

magpie object of the PBL_MACC_2022 data

Author(s)

Michael Windisch, Florian Humpenoeder

See Also

readSource()

readPBL_MACC_SSP2_2022 *Read in PBL MAC curves from Harmsen_et_al_2022 for different subtypes and subsets, using the baseline-dependent IMAGE SSP2 version*

Description

Read in PBL MAC curves from Harmsen_et_al_2022 for different subtypes and subsets, using the baseline-dependent IMAGE SSP2 version

Usage

```
readPBL_MACC_SSP2_2022(subtype, subset)
```

Arguments

subtype	data subtype. "ch4coal","ch4oil","ch4gas","ch4wstl","ch4wsts","ch4rice","ch4animals","ch4anmlwst", "n2otrans","n2oadac","n2onitac","n2ofert","n2oanwst","n2owaste"
subset	data subset. "Default", "Optimistic", "Pessimistic"

Value

magpie object of the PBL_MACC_SSP2_2022 data

Author(s)

Michael Windisch, Florian Humpenoeder, Gabriel Abrahao

See Also

readSource()

---

readPRIMAPhist *readPRIMAPhist*

Description

Read in an PRIMAP-hist data csv file as magclass object.

Usage

```
readPRIMAPhist(subtype)
```

Arguments

subtype	data subtype. available subtypes are: • hist • hist_no_ex

Value

magpie object of the PRIMAP-hist data.

Author(s)

Roman Popov

See Also

readSource()

Examples

```
## Not run:
a <- readPRIMAPhist("PRIMAPhist", "hist")

## End(Not run)
```

`readResFor2ndBE` *readResFor2ndBE*

Description

Read in old ReMIND use of residues for 2nd generation bioenergy and newly estimations

Usage

```
readResFor2ndBE(subtype)
```

Arguments

`subtype`	oldReMIND, newAgriSupply

Value

List of magpie objects with results on old ReMIND regions level

Author(s)

Kristine Karstens

See Also

`readSource()`

Examples

```
## Not run:
a <- readSource("ResFor2ndBE", subtype = "oldReMIND")

## End(Not run)
```

readSchofield *Read parameters of Schofield equations*

Description

University, United Nations. 2004. Human Energy Requirements: Report of a Joint FAO/WHO/UNU
Expert Consultation: Rome, 17-24 October 2001. Vol. 1. Food & Agriculture Org. http://books.google.com/books?hl=en&lr=
Hr6&sig=ocPdelHKyX2_npUTh41zZRRHf68. #nolint

Usage

```
readSchofield()
```

Value

MAgPIE object

Author(s)

Benjamin Bodirsky

See Also

`readSource()`

Examples

```
## Not run:
a <- readSource("Schofield")

## End(Not run)
```

readSoilGrids *readSoilGrids*

Description

This function reads the raw SoilGrids data (available at https://files.isric.org/soilgrids/data/recent/OCSTHA_M_30cm_250m_
or if available the preprocessed raster layers.

Usage

```
readSoilGrids(subtype)
```

Arguments

subtype	Switch between different input. Use predefined ones or any FileName specified in 'SoilGrids/META_GEOTIFF_1B.csv'

Value

magpie object in cellular resolution

Author(s)

Kristine Karstens

See Also

downloadSoilGrids()

Examples

```
## Not run:
readSource("SoilGrids", subtype = "cstock_0_30")

## End(Not run)
```

---

readSSPResults *readSSPResults*

Description

Reads in a reporting mif file from the SSP scenario results

Usage

```
readSSPResults()
```

Value

MAgPIE object with regional aggregation of SSP regions, including all indicators

Author(s)

Abhijeet Mishra, Florian Humpenoeder

See Also

readSource()

Examples

```
## Not run:
readSource("SSPresults", aggregate = FALSE)

## End(Not run)
```

---

readTNC2019 *readTNC2019*

Description

Reads geospatial data from 'the nature conservancy' on ecoregions, major habitat types (MHT, or biome types) and biogeographic realms.

Usage

```
readTNC2019()
```

Value

Returns magpie object with a share of each spatial unit belonging to a biogeographic realm and major habitat type.

Author(s)

Patrick v. Jeetze

Examples

```
## Not run:
readSource("TNC2019", convert = "onlycorrect")

## End(Not run)
```

---

readTransportCostsGTAP *Read Transport Costs*

Description

Read in Transport Costs from GTAP

Usage

```
readTransportCostsGTAP()
```

Value

Transport Costs in USD

Author(s)

David Chen

See Also

readSource()

Examples

```
## Not run:
a <- readSource(type = "TransportCostsGTAP")

## End(Not run)
```

---

readVanDrecht2009 *readvanDrecht2009*

Description

Reads a dataset containing values for sewage

Usage

```
readVanDrecht2009()
```

Value

A MAgPIE object containing sewage quantities and losses

Author(s)

Benjamin Leon Bodirksy

Examples

```
## Not run:
x <- readSource("VanDerWerf2010")

## End(Not run)
```

readWBGEM *readWBGEM*

Description

read raw data of world commodity prices from the dataset of World Bank global economic monitor

Usage

```
readWBGEM()
```

Value

magpie object of global price of commodities

Author(s)

Xiaoxi Wang

See Also

readSource()

Examples

```
## Not run:
readSource(type = "WBGEM")

## End(Not run)
```

readWHO *Read WHO*

Description

Read-in WHO (World health organization) data files as magpie object. The files contain information on physical inactivity

Usage

```
readWHO(subtype)
```

Arguments

subtype	Type of WHO data that should be read. Includes physical_inactivity_adults and physical_inactivity_underaged

Value

magpie object of the WHO data

Author(s)

Benjamin Bodirsky

See Also

readSource()

Examples

```
## Not run:
a <- readSource(type = "WHO", subtype = "physical_activity_adults")

## End(Not run)
```

---

readZhang2015 *Read Nitrogen Use Efficiency Paramerst from Zhang et al 2015*

Description

Publication: Zhang, Xin, Eric A. Davidson, Denise L. Mauzerall, Timothy D. Searchinger, Patrice Dumas, and Ye Shen. 2015. "Managing Nitrogen for Sustainable Development". Nature 528 (7580): 51–59. https://doi.org/10.1038/nature15743.

Usage

```
readZhang2015()
```

Value

MAgPIE object

Author(s)

Benjamin Leon Bodirsky

See Also

readSource()

Examples

```
## Not run:
a <- readSource("Zhang2015", convert = FALSE)

## End(Not run)
```

`toolAWMSScenarioCreation` *toolAWMSScenarioCreation*

Description

tool function to calculate the share of manure managed in different animal waste management systems in confinements.

Usage

```
toolAWMSScenarioCreation(name, startYear, categories, values, out)
```

Arguments

`name`	Name of the scenario
`startYear`	Year were prediction starts
`categories`	share of manure managed in different animal waste management systems
`values`	target values
`out`	contains historical data

Value

List of magpie objects with results on country level, weight on country level, unit and description.

Author(s)

Edna J. Molina Bacca

See Also

`calcAWMSconfShr()`

toolCalcIEAfromStructureMappingPEFE *toolCalcIEAfromStructureMappingPEFE*

Description

mapping IEA reported data to ReMIND-MAgPIE items

Usage

```
toolCalcIEAfromStructureMappingPEFE(data, structureMapping, subtype = "remind")
```

Arguments

data	data to map
structureMapping	mapping to use
subtype	remind (default), edge, pfu or magpie

Value

MAgPIE object with completed time dimensionality.

Author(s)

Anastasis Giannousakis, Lavinia Baumstark, Isabelle Weindl

toolPregnant *toolPregnant*

Description

extra intake kcal/day for pregnant women. The number of pregnant women is computed through the number of 0 year old children each year (Lutz dataset). According to Human energy requirments , Fao (Rome, 2004) , a woman requires an additional food of 845 kcal/day and 675 kcal/day of food on average furing her pregancy and lactation period respectively. According to Naegele?s rule, the mean gestation period is 280 days (40 weeks) and the lactation period 6 month (25 weeks).

Usage

```
toolPregnant(demo, reproductive)
```

Arguments

demo	demo is the population divided by sex male (M) , female (F) and both (B) and divided by 8 age classes: 0-4, 5-9, 10-14, 15-19, AG1 (20-29), AG2 (30-59), AG3(60-79), AG4(80+)
reproductive	reproductive age classes (on which the energy requiremetns for newborns are distributed)

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