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IFPRI-Globe Model manual

The 19-region global computable general equilibrium model in RIAPA.ai: scenarios, closures, poverty, undernourishment, and saved results.

International Food Policy Research Institute

Web edition | 27 November 2026 | GTAP 12A 2023 | 19 regions | 27 sectors | 67 household groups

A self-contained guide to the GTAP-based IFPRI-Globe global model in RIAPA.ai: defining regional and bilateral trade scenarios, checking closure rules, and reading saved results.

UNDERSTAND THE MODEL

Structure, closures, interpretation

DEFINE A SCENARIO

Inputs, trade routes, approvals

READ THE RESULTS

Save, browse, compare

Support: info@riapa.ai

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Scope. This manual describes **World: IFPRI-Globe (19 regions, 2023)** in RIAPA.ai: controls, closure rules, outcome definitions, poverty and undernourishment calculations, region membership, and a worked rice productivity example.

1. What IFPRI-Globe represents

IFPRI-Globe is a comparative-static global computable general equilibrium (CGE) model integrated into the RIAPA.ai platform (named after IFPRI's Rural Investment and Policy Analysis modeling suite). It links production, bilateral trade, incomes, household demand, poverty, and calorie undernourishment across 19 regions calibrated to a 2023 baseline.

A scenario compares an alternative equilibrium against the 2023 baseline. The model has no multi-year dynamic path; all results are conditional on the approved shocks and closure rules.

Count	What the model represents
19	Regions linked through bilateral trade and international transport margins (section 11)
27	Activities and 27 matching commodities, including 12 food sectors with detailed outputs and prices (section 12)
6	Primary factors: agricultural land, 3 labor skill groups, capital, and natural resources
67	Household groups: 5 population fifths (quintiles) in 12 low- and middle-income regions and 1 aggregate group in 7 regions
3	International poverty lines at 2021 purchasing power parity (PPP): US$3.00, US$4.20 and US$8.30 per person per day

How the economy adjusts

The social accounting matrix is calibrated from Global Trade Analysis Project (GTAP) 12A (2023). Production combines intermediate inputs in fixed Leontief proportions with a constant-elasticity-of-substitution (CES) primary-factor nest (whereas top-level total factor productivity scales down all input requirements proportionally, unlike primary-factor productivity; see section 4 for input files). Armington CES functions differentiate domestic goods and imports by source; constant-elasticity-of-transformation (CET) functions allocate output between domestic sales and exports.

Household demand follows a linear expenditure system (LES). Unlike the single-country RIAPA models, IFPRI-Globe has no enterprise income account: factor incomes net of taxes accrue directly to households. Direct taxes, saving rates, and government or investment accounts follow the selected closure rules (section 6).

2. Start a web analysis

Sign in to RIAPA.ai with your verified account and select **World: IFPRI-Globe (19 regions, 2023)** from **Active model** in the sidebar or mobile menu. Open **Regions** beside the message box to inspect which model region represents each country or territory.

Before the first draft	What to decide
Question	State the policy question, target sectors, and outcomes of interest.
Geography	Open Regions to choose Shock regions (default target regions for new drafts when not named in chat) and Results focus (filter for displayed outputs and Browse outcomes). All 19 regions remain active in every simulation.
Economic lever	Choose a supported productivity, factor, tax, or bilateral trade lever (sections 4 and 5).
Closures	Keep default macroeconomic and factor rules or request specific alternatives (section 6).
Alternatives	Name up to five independent alternatives starting from the common 2023 baseline.

Brazil, Argentina, India, and Indonesia have individual country regions. All other countries and areas are grouped into aggregate regions (section 11). Setting Shock regions in the Regions window does not edit an existing draft proposal; ask the assistant for a revised draft if targets need to change.

> **Daily limits and refunds.** Standard accounts receive up to 20 scenarios per UTC calendar day across all models and conversations, plus 200 AI chat/report requests per day (up to 6 per minute). If the solver cannot find an equilibrium solution, up to three non-convergent attempts per UTC day are automatically refunded to your daily scenario allowance; failures before submission never count.

3. Draft, approve and run a scenario

A draft proposal card shows your assumptions alongside structured model inputs. Nothing executes until you explicitly approve.

Step	Action in RIAPA.ai
1. Define	State regions, sectors, lever, and magnitude (or try a World starter example).
2. Review	Inspect plain-language assumptions and expand Technical model inputs if needed. Ask for revisions if targets, units, or closures differ from your intent.
3. Approve	Click Run scenarios (or reply proceed to approve the reviewed proposal when one draft is pending). Each alternative solves independently against the 2023 baseline.
4. Check status	Monitor live execution in Scenarios. Solver completion and saving result archives are distinct stages.
5. Explore	Click Explain results, Write report, Browse outcomes, Download CSVs, or Run details; select 2 to 5 runs for Compare scenarios.

RIAPA.ai supports 12 structured input files for IFPRI-Globe (sections 4 to 6). World commodity prices, nominal exchange rates, foreign savings, population, and government consumption cannot be directly shocked in RIAPA.ai; world export prices respond endogenously.

4. Productivity and factor inputs

Web users state shocks in plain English and the assistant creates these structured tables behind the scenes. Files ending in `_p_change.csv` specify percentage changes relative to the 2023 baseline (a value of 1 means +1%; 0 means no change). Only sectors, trade routes, and factors present in a region's 2023 baseline can be shocked.

File	Row keys	Meaning of Scenario value
`tfp_p_change.csv`	Region, Activity	Percent change in total factor productivity. Applies to all inputs of the activity.
`tfp_va_p_change.csv`	Region, Activity	Percent change in productivity of the primary-factor composite.
`fprd_p_change.csv`	Region, Factor, Activity	Percent change in efficiency of a specific factor in an activity.
`fs_p_change.csv`	Region, Factor	Percent change in factor supply. Requires factor closure code 1.

Productivity and factor-supply percentage changes must exceed -100%. Supply shocks to a factor require that factor to be set to closure code 1 (full employment with adjustable wage/return); applying a supply shock to a factor under code 2 or 3 fails validation before submission (see section 6).

5. Tax and trade inputs

Files ending in `_diff.csv` add or subtract percentage points relative to the baseline tax or tariff rate (for example, +5 adds 5 percentage points). Trade routes use separate exporter (`Source`) and importer (`Destination`) keys.

File	Row keys	Meaning of Scenario value
`tm_diff.csv`	Source, Destination, Commodity	Import tariff change in percentage points. Destination is the importer.
`tm_p_change.csv`	Source, Destination, Commodity	Percent change in the base import tariff rate (-100 removes the tariff).
`te_diff.csv`	Source, Destination, Commodity	Export tax change in percentage points. Source is the exporter.
`te_p_change.csv`	Source, Destination, Commodity	Percent change in the base export tax rate (-100 removes the export tax).
`tx_diff.csv`	Region, Activity	Output tax change in percentage points. A negative change acts as a subsidy.
`tv_diff.csv`	Region, Commodity	Sales tax change on household purchases in percentage points.
`tyh_diff.csv`	Region, Household	Household direct-tax change in percentage points. Use government closure 1 or 4 (see section 6).

To replace an existing bilateral import tariff or export tax with a uniform rate (for example 10%), combine a -100% relative removal in `_p_change.csv` with +10 percentage points in `_diff.csv` on the same route. Resulting ad valorem import tariffs and household sales taxes must stay strictly above -100%, output and export taxes strictly below 100%, and household direct taxes at least 0% and strictly below 100%.

6. Closures set the experiment

Closures in `CLOSURES.csv` (the 12th structured input file) apply uniformly across all 19 regions. Changing a macro or factor closure fundamentally alters the economic experiment.

Switch	Default	Accepted codes
`NUMERAIRE`	1	1: regional consumer price index fixed. 2: regional domestic producer price index fixed. In all runs, the world numeraire is fixed as an export-weighted exchange-rate basket of North America, Europe, High-income Asia, and Australia and New Zealand.
`SAVINGS-INVESTMENT`	1	1: household saving rates fixed and investment adjusts. 2: investment share of absorption fixed and household saving rates scale.
`CURRENT-ACCOUNT`	1	1: regional foreign savings fixed in world currency and the real exchange rate adjusts. Code 2 is unsupported.
`GOVERNMENT-ACCOUNT`	1	1: tax rates fixed and government saving adjusts; government consumption keeps its nominal share of domestic absorption (so real government consumption need not move one-for-one with real absorption). 2: direct-tax rates scale. 3: household direct-tax rates scale. 4: non-household sales-tax rates (taxes on intermediate, investment, and government purchases) scale. Codes 2 to 4 fix government saving and maintain that absorption share.
`Agricultural land (flnd), labor (flab-n, flab-s, flab-t), capital (fcap) (section 13)`	1	1: full employment, mobile across activities. 2: fixed factor return, flexible employment. 3: activity-specific fixed factor quantity, sector-specific returns adjust.
`Natural resources (fnat) (section 13)`	3	Same factor codes. Default natural resources stay activity-specific (code 3).

Critical factor-closure warning (inverted vs. national RIAPA models): In IFPRI-Globe, factor **code 2** holds the wage/return fixed with flexible employment, whereas **code 3** holds factor quantities fixed within each activity (sector-specific returns adjust). National RIAPA models reverse those two codes (code 2 is activity-specific; code 3 is fixed wage / unemployment). Always verify codes 2 vs. 3 when switching between national and global models.

Because IFPRI-Globe has no enterprise account, GOVERNMENT-ACCOUNT codes 2 and 3 produce identical scaling of household direct tax rates; direct-tax input shocks are disallowed under either code. To simulate a short-run experiment holding land and capital fixed by sector, set land (flnd) = 3 and capital (fcap) = 3 while keeping labor at 1 and natural resources (fnat) at 3 (section 13).

7. Read saved results

Completed simulations save verified archives containing **869 exported outcomes** (plus solver diagnostics in `results_solve.csv` where solvestat = 1 and modelstat = 1 confirm equilibrium convergence). Price and exchange-rate indices measure relative price shifts against the numeraire rather than monetary inflation. Use **Browse outcomes** to filter saved values or download the CSV ZIP for full precision.

Outcome family	Meaning and units
`GDPMP, PRVCON, FIXINV, GOVCON, ABSORP, EXPORTS, IMPORTS`	World real aggregates — GDP at market prices (GDPMP), private consumption (PRVCON), fixed investment and stocks (FIXINV), government consumption (GOVCON), total domestic absorption (ABSORP), exports (EXPORTS), and imports (IMPORTS); add _India or another region code from section 11 for regional rows. Levels are billion US$ at 2023 base prices and exchange rates.
`AGR_GDP, IND_GDP, SRV_GDP`	Real value added by broad sector (agriculture, industry, services). Their sum is GDP at factor cost rather than GDP at market prices, which also includes net indirect taxes.

Outcome family	Meaning and units
`PRC_FOOD, PRC_FOOD_[region]`	Consumer food-price indices (World average PRC_FOOD and regional PRC_FOOD_[region]) relative to the regional numeraire. Base = 100.
`Cons_[region]_[household]`	Real consumption of the entire household group at base prices, in billion US$ at 2023 base prices (not a per-person amount).
`QA_[region]_[activity]`	Gross-output volume index for the 12 food activities (Base = 100; section 12). Not tonnes or hectares.
`PQ_[region]_[commodity]`	Consumer price index for each of the 12 food commodities relative to the regional numeraire (Base = 100; section 12).
`PWE_[commodity], REXR_[region]`	World free-on-board (FOB) export-price index (all 27 commodities) and regional real exchange-rate index (19 regions). Base = 100; a rise in REXR means real depreciation.
`Pov_nat_[line], Pov_[region]_[line], Hun_nat, Hun_[region]`	Poverty rates (2021 PPP: US$3.00, US$4.20, US$8.30/day) and calorie undernourishment rates (% of World Bank Poverty and Inequality Platform (PIP) or FAO reference population). See the _nat callout below.

Interpreting _nat codes in IFPRI-Globe: Even though IFPRI-Globe has no country-specific national poverty lines, the exported global total poverty and hunger identifiers reuse the suffix **_nat** (such as **Pov_nat_3.00**, **Pov_nat_4.20**, **Pov_nat_8.30**, and **Hun_nat**): **_nat always means World Total** across all 19 regions.

Units convention: Economic and consumption outcomes report percentage changes (%). Poverty (Pov_) and calorie undernourishment (Hun_) outcomes report percentage-point changes (pp: scenario rate minus baseline rate). Exported CSV archives remain fixed per run; Browse outcomes filters only change on-screen visibility.

Coverage summary (869 saved outcomes)

Outcome family	Rows	Coverage
Real macro aggregates	140	7 outcomes for World and 19 regions
Broad-sector value added	60	Agriculture, industry and services for World and 19 regions
Food-price indices	20	World (PRC_FOOD) and 19 regions
Real exchange-rate indices	19	All 19 regions
Poverty rates	60	3 lines (US$3.00, US$4.20, US$8.30/day) for World (_nat) and 19 regions
Undernourishment rates	20	World (_nat) and 19 regions
Household consumption	67	All 67 regional household groups
Food output indices	228	12 food activities in 19 regions
Food consumer-price indices	228	12 food commodities in 19 regions
World export-price indices	27	All 27 commodities

8. Poverty and hunger calculations

After the CGE model solves prices, incomes, and real consumption, dedicated GAMS post-solution modules compute poverty headcounts and calorie undernourishment rates from fixed external microdata distributions.

Poverty (World Bank PIP 2023 at 2021 PPP)

Regional welfare distributions come from World Bank Poverty and Inequality Platform (PIP) 2023 records expressed at 2021 PPP (with the 99th-percentile upper tail trimmed prior to fitting an 8,192-point kernel cumulative density). In regions with 5 household quintiles, each quintile's solved real consumption ratio scales its baseline consumption band before summing headcounts below US$3.00/day (the fixed primary international extreme-poverty line), US$4.20/day, and US$8.30/day. In the 7 single-group regions, the single aggregate household group's solved real consumption ratio scales the entire regional distribution.

Calorie undernourishment (FAO 2023 SDG 2.1.1)

Regional calorie undernourishment combines country lognormal dietary-energy distributions and minimum dietary energy requirements (MDER) from FAO 2023 records (falling back to 2022 where needed; countries without FAO records are assigned their regional average, and regional headcounts cover the full FAO 2023 regional population). Each household quintile's solved food-quantity ratio scales the corresponding fifth of the calorie distribution; in the 7 single-group regions, the single aggregate group's solved food-quantity ratio scales the regional calorie distribution. Because PIP and FAO population totals differ slightly across countries and years, poverty and hunger reference populations are reported separately in written technical reports (via Write report).

Aggregate poverty and hunger rate shifts represent net population changes under static model assumptions; they do not identify individual households entering or exiting poverty or establish statistical significance.

9. Example of a rice productivity gain

Raising total factor productivity in Indian rice (`tfp_p_change.csv`, Region = India, Activity = arice, Scenario = 1) with default closures illustrates core model responses:

Indicator	Change	Unit
World real GDP	+0.0014	percent
India real GDP	+0.0402	percent
India agricultural value added	+0.1811	percent
India rice consumer price	-1.5394	percent
India rice gross output	-0.0305	percent
Consumption of India's poorest fifth	+0.0826	percent
World poverty at US$3.00/day	-0.0039	percentage points
India poverty at US$3.00/day	-0.0202	percentage points
World calorie undernourishment	-0.0152	percentage points
India calorie undernourishment	-0.0799	percentage points

Why gross output can fall slightly when value added and real GDP rise: The rice activity in India uses rice as an intermediate input (such as seed and paddy-to-milled grain flows). A 1% total factor productivity gain across all inputs lowers intermediate input requirements per unit of gross output, so real agricultural value added (+0.1811%, measured by double deflation: gross output minus intermediate inputs at base prices) and real GDP rise even as gross rice output edges down slightly (-0.0305%).

Limits on explaining household gains: For India's poorest fifth (+0.0826%)—as for other household groups—exported results do not contain household expenditure-share or factor-income decomposition tables, so quintile consumption gains should not be attributed solely to a food-price channel or factor-income channel without a controlled decomposition.

10. Save, compare and recover results

Saved conversations retain their exact model version (IFPRI-Globe, GLB_2023), baseline snapshot, approved inputs, and outputs. Switching models opens a new conversation without discarding earlier chats.

After simulations finish, select one run for **Explain results**, **Write report**, **Browse outcomes**, **Download CSVs**, or **Run details**. Select two to five runs from the same baseline and model version for **Compare scenarios** beneath the results (or **Compare selected scenarios** in **Scenarios**); alternatives remain independent what-if experiments and never accumulate across scenarios.

What you see	Recommended action
Interrupted / pending job	Use Refresh status first (no new job submitted), then Check or resume simulations if approved runs remain active.
Solved job awaiting files	Use Retry saving results when offered; this retrieves existing archives without re-running the model.
Could not solve (infeasible)	Inspect Run details, scale down large shocks (for example, halve them), or review closures before re-running (up to three non-convergent attempts per UTC day are refunded automatically).

11. Regions and country membership

Brazil, Argentina, India, and Indonesia appear as single-country regions; the remaining 15 model regions aggregate multiple countries and territories from GTAP 12A (163 economic units linked to 235 territory names). Regional simulations shock the entire model region, so confirm whether a single-country question requires a regional proxy before approving.

Code	Model region	Scope & groups	Source countries and territories
NAmer	North America	Aggregate region 1 group	Bermuda • Canada • Greenland • Saint Pierre and Miquelon • United States of America
Braz	Brazil	Individual country 1 group	Brazil
Argt	Argentina	Individual country 1 group	Argentina
LatAm	Rest of Latin America	Aggregate region 5 population fifths	Aruba • Anguilla • Antigua and Barbuda • Bonaire, Sint Eustatius and Saba • Bahamas • Belize • Bolivia (Plurinational State of) • Barbados • Chile • Colombia • Costa Rica • Cuba • Curaçao • Cayman Islands • Dominica • Dominican Republic • Ecuador • Falkland Islands (Malvinas) • Grenada • Guatemala • French Guiana • Guyana • Honduras • Haiti • Jamaica • Saint Kitts and Nevis • Saint Lucia • Mexico • Montserrat • Nicaragua • Panama • Peru • Puerto Rico • Paraguay • El Salvador • Suriname • Sint Maarten (Dutch part) • Turks and Caicos Islands • Trinidad and Tobago • Uruguay • Saint Vincent and the Grenadines • Venezuela (Bolivarian Republic of) • British Virgin Islands • United States Virgin Islands
Eur	Europe	Aggregate region 1 group	Albania • Austria • Belgium • Bulgaria • Saint Barthélemy • Switzerland • Cyprus • Czechia • Germany • Denmark • Spain • Estonia • Finland • France • United Kingdom of Great Britain and Northern Ireland • Guadeloupe • Greece • Croatia • Hungary • Ireland • Iceland • Italy • Liechtenstein • Lithuania • Luxembourg • Latvia • Saint Martin (French Part) • Malta • Martinique • Netherlands (Kingdom of the) • Norway • Poland • Portugal • Réunion • Romania • Serbia • Slovakia • Slovenia • Sweden
FSU	Former Soviet Union	Aggregate region 1 group	Andorra • Armenia • Azerbaijan • Bosnia and Herzegovina • Belarus • Channel Islands (Guernsey, Jersey) • Faroe Islands • Georgia • Gibraltar • Isle of Man • Kazakhstan • Kyrgyzstan • Monaco • Republic of Moldova • North Macedonia • Montenegro • Mongolia • Russian Federation • San Marino • Tajikistan • Turkmenistan • Ukraine • Uzbekistan • Kosovo
China	China	Aggregate region 5 population fifths	China • China, Hong Kong Special Administrative Region
India	India	Individual country 5 population fifths	India
RSAsia	Rest of South Asia	Aggregate region 5 population fifths	Afghanistan • Bangladesh • Bhutan • Sri Lanka • Maldives • Nepal • Pakistan
Indo	Indonesia	Individual country 5 population fifths	Indonesia
ThaiViet	Thailand and Viet Nam	Aggregate region 5 population fifths	Thailand • Viet Nam

Code	Model region	Scope & groups	Source countries and territories
RoSEAsia	Rest of Southeast Asia	Aggregate region 5 population fifths	Brunei Darussalam • Cambodia • Lao People's Democratic Republic • China, Macao Special Administrative Region • Myanmar • Malaysia • Philippines • Democratic People's Republic of Korea • Saint Helena • Timor-Leste
RichAsia	High-income Asia	Aggregate region 1 group	Japan • Republic of Korea • Singapore • China, Taiwan Province of
AusNZ	Australia and New Zealand	Aggregate region 1 group	American Samoa • Australia • Cook Islands • Fiji • Micronesia (Federated States of) • Guam • Kiribati • Marshall Islands • Northern Mariana Islands • New Caledonia • Niue • Nauru • New Zealand • Palau • Papua New Guinea • French Polynesia • Solomon Islands • Tokelau • Tonga • Tuvalu • Vanuatu • Wallis and Futuna Islands • Samoa
MENA	Middle East and North Africa	Aggregate region 5 population fifths	United Arab Emirates • Bahrain • Algeria • Egypt • Western Sahara • Iran (Islamic Republic of) • Iraq • Israel • Jordan • Kuwait • Lebanon • Libya • Morocco • Oman • State of Palestine • Qatar • Saudi Arabia • Syrian Arab Republic • Tunisia • Türkiye • Yemen
WAfr	West Africa	Aggregate region 5 population fifths	Benin • Burkina Faso • Côte d'Ivoire • Cabo Verde • Ghana • Guinea • Gambia • Guinea-Bissau • Liberia • Mali • Mauritania • Niger • Nigeria • Senegal • Sierra Leone • Togo
CAfr	Central Africa	Aggregate region 5 population fifths	Central African Republic • Cameroon • Democratic Republic of the Congo • Congo • Gabon • Equatorial Guinea • Sao Tome and Principe • Chad
EAfr	East Africa	Aggregate region 5 population fifths	Burundi • Djibouti • Eritrea • Ethiopia • Kenya • Mayotte • Rwanda • Sudan • Somalia • South Sudan • Seychelles • United Republic of Tanzania • Uganda
SAfr	Southern Africa	Aggregate region 5 population fifths	Angola • Botswana • Comoros • Lesotho • Madagascar • Mozambique • Mauritius • Malawi • Namibia • Eswatini • South Africa • Zambia • Zimbabwe

Key mapping conventions: China includes mainland China and Hong Kong SAR; Taiwan maps to High-income Asia; Macao SAR and Saint Helena map to Rest of Southeast Asia. Other small territories and European/Eurasian non-EU economies follow GTAP 12A's standard statistical regional groupings. Including a country in an aggregate region reflects GTAP 12A groupings and does not mean separate country-level poverty or hunger outputs are available. Neither "World" nor global totals can be selected as regional shock targets.

12. Activity and commodity codes

IFPRI-Globe covers 27 producing activities (a*) and 27 matching traded commodities (c*). Detailed QA_* output and PQ_* consumer price indices cover the 12 food sectors; PWE_* covers world FOB export prices for all 27 commodities. Accommodation and food services (ahotl/chotl) is classified under services rather than the 12 food commodities.

Activity	Commodity	Sector description
arice	crice	Rice (paddy and processed) [food sector]
awhea	cwhea	Wheat [food sector]
aogrn	cogrn	Other grains [food sector]
avegf	cvegf	Vegetables, fruit and nuts [food sector]
aoils	coils	Oilseeds [food sector]
acash	ccash	Cash crops (sugar, fibers, other crops) [food sector]
alive	clive	Livestock and raw milk [food sector]
afish	cfish	Fishing [food sector]
afore	cfore	Forestry
amine	cmine	Energy mining (coal, oil, gas)
amino	cmino	Other mining
ameat	cmeat	Meat processing [food sector]
afoil	cfoil	Vegetable oils and fats [food sector]
adair	cdair	Dairy products [food sector]
afobe	cfobe	Other food, sugar, beverages and tobacco [food sector]
aoagp	coagp	Non-food agro-processing (textiles, wood, paper)
apetr	cpetr	Petroleum and coal products
achem	cchem	Chemicals, pharmaceuticals, rubber and plastics
ametm	cmetm	Metals and mineral products
aoman	coman	Other manufacturing (machinery, vehicles, electronics)
acons	ccons	Construction
autil	cutil	Electricity, gas and water
atrad	ctrad	Trade
ahotl	chotl	Accommodation and food services
atran	ctran	Transport and warehousing
apsrv	cpsrv	Private services (finance, real estate, business, other)
apubl	cpubl	Public services (administration, education, health)

13. Factors and household groups

Primary factors (6)

Factor code	Meaning
flnd	Land
flab-n	Unskilled labor (agricultural and other low-skilled)
flab-s	Semi-skilled labor (clerks, service and shop workers)
flab-t	Skilled labor (technicians, professionals, managers)
fcap	Capital
fnat	Natural resources

Household groups (5 quintiles in 12 regions; 1 group in 7 regions)

Group code	Meaning
hhd-q1	Poorest 20% of the population, ranked by welfare per person
hhd-q2	Second fifth of the population
hhd-q3	Middle fifth of the population
hhd-q4	Fourth fifth of the population
hhd-q5	Richest 20% of the population
hhd	Single household group covering the entire region (used in 7 regions)

Because household-group populations remain fixed within a comparative-static simulation, a percentage change in group real consumption (Cons_*) equals its average per-person real consumption change. However, monetary level values in Cons_* represent group totals in billion US$ at 2023 base prices rather than per-capita values.

14. Interpretation and references

Report results as conditional comparative-static simulation estimates alongside verified input tables, closure assumptions, and CSV downloads. Aggregate outputs do not identify individual household transitions, statistical significance, or isolated causal channels beyond the reported tables.

IFPRI-Globe model reference: Mukashov et al. 2026. *IFPRI-Globe: A Global Computable General Equilibrium Model for Household Welfare, Poverty, and Undernourishment Analysis.* IFPRI working paper, forthcoming.

RIAPA.ai platform reference: Mukashov, Askar; Kim, Soonho; Fang, Peixun; Diao, Xinshen; Thurlow, James; Proctor, Joshua; Rennison, Alan. 2026. *An agentic AI assistant for country-level economic modeling: Methods, data, and expert evaluation.* IFPRI Discussion Paper 02424. Washington, DC: International Food Policy Research Institute. https://hdl.handle.net/10568/183521

Questions about data, regional mappings, or results: info@riapa.ai. This manual distributes no licensed GTAP database files.