

SECTION 1: COUNTRY OVERVIEW & GEOGRAPHIC PROFILE

1.1 Basic Country Information

Country Name	People’s Republic of China
Capital City	Beijing
BRICS Status	Founding Member – Original BRIC (2006 dialogue; first summit 2009).
Total Population	~1,408.28 million (end of 2024, NBS Statistical Communiqué); world’s 2nd most populous (after India since 2023)
Population Growth Rate	-0.99 per thousand (2024, NBS) – natural decline: 9.54M births vs 10.93M deaths
Rural Population (%)	~33% (~464.78M); urban: ~67% (943.50M urban permanent residents, end 2024, NBS)
Urban Population (%)	67.0% (2024, NBS); urbanisation rate continuing to rise
GDP (Nominal)	134,908.4 billion yuan (2024, NBS); ~USD 18.5–19.0 trillion at avg exchange rate 7.12 RMB/USD; +5.0% real growth
GDP per Capita	~USD 13,100–13,500 (2024, IMF/NBS)
Agriculture’s Share of GDP	Primary industry: 6.8% of GDP (9,141.4 billion yuan, 2024, NBS). Agriculture and related industries: 15.29% of GDP (20.6 trillion yuan, NBS 2024 extended accounting)
Agriculture’s Share of Employment	~23–25% of total workforce (~170–180M agricultural workers; 299.73M rural migrant workers in 2024, NBS)
HDI Rank	0.788 (2023/24, UNDP) – High Human Development; ~75th globally
Official Language(s)	Standard Chinese (Mandarin/Putonghua); 7 major dialect groups; 56 recognised ethnic groups with own languages
Currency	Renminbi (RMB/CNY); avg 7.12 RMB/USD in 2024 (NBS)

1.2 Geographic Coordinates & Physical Extent

Total Geographic Area	~9,596,960 km ² – world’s 3rd/4th largest country; spans 5 time zones (but uses single Beijing Time UTC+8)
Northernmost Point	~53°33’ N (Mohe, Heilongjiang – Amur River border with Russia)
Southernmost Point	~3°52’ N (Zengmu Ansha, Nansha Islands, South China Sea; mainland: 18°10’ N Hainan)
Easternmost Point	~134°46’ E (junction of Heilong and Wusuli rivers)
Westernmost Point	~73°29’ E (Pamir Plateau, Xinjiang)
Coastline	~18,000 km (mainland); ~32,000 km including islands
Land Borders	~22,117 km (borders 14 countries: Russia, Mongolia, Kazakhstan, Kyrgyzstan, Tajikistan, Afghanistan, Pakistan, India, Nepal, Bhutan, Myanmar, Laos, Vietnam, North Korea)
Highest Point	Mount Everest / Qomolangma, 8,848.86 m (Tibet/Nepal border) – world’s highest

Major Rivers	Yangtze (Chang Jiang, 6,300 km – Asia’s longest); Yellow (Huang He, 5,464 km); Pearl (Zhu Jiang); Mekong (Lancang); Heilongjiang (Amur)
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1.3 Administrative Divisions

Primary Level	34 provincial-level divisions: 23 provinces, 4 municipalities (Beijing, Tianjin, Shanghai, Chongqing), 5 autonomous regions (Tibet, Xinjiang, Inner Mongolia, Guangxi, Ningxia), 2 SARs (Hong Kong, Macau)
Secondary Level	333 prefecture-level divisions (prefectural-level cities, prefectures, autonomous prefectures, leagues)
Tertiary Level	~2,844 county-level divisions (districts, county-level cities, counties, autonomous counties, banners)
Key Agricultural Provinces	Heilongjiang (#1 grain); Henan (#1 wheat); Sichuan (#1 pigs); Hunan, Jiangxi (rice); Shandong (vegetables, livestock); Xinjiang (cotton); Yunnan (tea, tropical); Hubei (freshwater fish)

SECTION 2: AGRO-CLIMATIC ZONES & CLASSIFICATION

2.1 National Classification

System	Chinese Academy of Agricultural Sciences (CAAS) / China Meteorological Administration (CMA) agro-climatic zonation
Total Zones	9 major agricultural zones (NBS/Ministry of Agriculture and Rural Affairs categorisation)
Basis	Temperature, rainfall, frost-free days, soil type, elevation, latitude

2.2 Zone-wise Description

Zone	Area	Climate	Crops	Challenges
1. Northeast Plain	Heilongjiang, Jilin, Liaoning, E. Inner Mongolia	Cold temperate/continental; 100–170 frost-free days; 400–700 mm rain	Rice (japonica), maize, soybean, sorghum; 'China's granary'	Short season; severe winter; chernozem-type black soil degradation
2. Huang-Huai-Hai Plain	Henan, Shandong, Hebei, Anhui, Jiangsu (N)	Warm temperate; 200–220 frost-free days; 500–900 mm	Winter wheat–summer maize double crop; cotton, peanuts, vegetables	Drought; salinisation; groundwater depletion; flooding (Yellow River)
3. Middle-Lower Yangtze	Hubei, Hunan, Jiangxi, Anhui (S), Jiangsu (S), Zhejiang	Subtropical; 240–300 frost-free days; 1,000–1,800 mm	Rice (indica, double/triple crop), rapeseed, freshwater fish, tea	Flooding; heat stress; cadmium contamination in some paddy soils
4. South China	Guangdong, Guangxi, Fujian, Hainan	Tropical/subtropical; 300–365 frost-free days; 1,200–2,500 mm	Rice (triple crop), sugarcane, tropical fruits, rubber, litchi, longan	Typhoons; heat; pest pressure; soil erosion
5. Southwest Highlands	Sichuan Basin, Yunnan, Guizhou, W. Chongqing	Subtropical basin / highland; variable; 800–1,600 mm	Rice, maize, rapeseed, tea, tobacco, medicinal herbs; Sichuan: pigs	Karst terrain; poverty; erosion; terracing challenges
6. Northwest Arid	Xinjiang, Gansu (W), Ningxia, W. Inner Mongolia	Arid/semi-arid; <250 mm rain (irrigated oases)	Cotton (#1 province: Xinjiang), grapes, melons, wheat; irrigated	Extreme aridity; desertification; water scarcity; salinisation
7. Qinghai-Tibet Plateau	Tibet, Qinghai, W. Sichuan	High altitude (3,000–5,000 m); <500 mm; harsh	Highland barley (qingke), yak herding, sheep; limited arable	Extreme cold; thin air; poor soils; fragile ecology
8. Inner Mongolia-Loess Plateau	Inner Mongolia (C/W), Shaanxi, Shanxi, Gansu (E)	Semi-arid continental; 300–500 mm; windy	Spring wheat, millet, potatoes, livestock grazing (sheep, cattle)	Desertification; soil erosion (Loess); overgrazing; dust storms

Zone	Area	Climate	Crops	Challenges
9. Northeast Forest/Frontier	N. Heilongjiang, N. Inner Mongolia	Boreal/subarctic; <100 frost-free days	Forestry, wild harvest (mushrooms, berries); limited farming	Permafrost; extreme cold; low population

SECTION 3: CLIMATE, RAINFALL & TEMPERATURE EFFECTS ON AGRICULTURE

3.1 Overall Climate

Köppen Classification	Highly diverse: Cfa/Cwa (humid subtropical, E/SE); Dwa/Dwb (humid continental, NE); BWk/BSk (arid/semi-arid, NW); ET (tundra, Tibetan Plateau); Af (tropical, Hainan)
National Avg Rainfall	~645 mm/year (highly variable: >2,500 mm in SE coast to <50 mm in Taklamakan Desert)
Growing Season	60–365 frost-free days (Tibetan Plateau to Hainan); monsoon rainfall (Jun–Sep) delivers 60–80% of annual precipitation

3.2 Rainfall & Temperature

Highest Rainfall	SE coast / Taiwan: 1,500–2,500 mm; Hainan: up to 2,800 mm
Lowest Rainfall	Northwest China (Taklamakan Desert (Xinjiang)): <50 mm; Turpan Depression
Hottest Region	Turpan (Xinjiang): avg Jul 40°C+; max 49.6°C
Coldest Region	Northeast china (Mohe (Heilongjiang)): avg Jan -28°C; record -52.3°C
Monsoon Influence	East Asian Monsoon dominates eastern agriculture; Southwest Monsoon affects Yunnan/Guangxi; critical for rice/wheat production timing

3.3 Climate-Resilient Agriculture and Climate Action

Initiative	Institution	Description	Impact
High-Standard Farmland Construction	Ministry of Agriculture / State Council	Target: 1.2 billion mu (~80M ha) by 2030; irrigation, drainage, soil improvement, field levelling	Over ~1 billion mu (66.7M ha) completed by 2024; yield increase 10–20%
Seed Industry Revitalisation	MARA / National Seed Industry Strategy	Major campaign to develop domestic crop/livestock genetics; reduce dependence on imported varieties	Domestic seed self-sufficiency rate >70%; new rice/wheat/maize varieties released annually
Green Agriculture Development	MARA / State Council	Reduce fertiliser/pesticide use; promote organic farming; ‘Zero Growth’ Action Plan since 2015	Fertiliser use -5%; pesticide use -1.5% from 2020 levels (MARA 2024)
Agricultural Technology Contribution	CAAS / Provincial Academies	Technology contribution rate to agriculture: 63.2% (2024, MARA); goal >70% by 2035	Over 800 research institutions, 120,000+ researchers, 400,000 grassroots extension technicians. Strong national R&D + extension system.
Soybean/Oilseed Expansion	State Council / MARA	National campaign to expand domestic soybean/oilseed production; reduce import dependency	Soybean: ~20.65 MT (2024); oilseed: ~39.79 MT; self-sufficiency up 4–5 pp since 2020
Climate-Smart Rice (Super Rice)	Yuan Longping Institute / CAAS	Super hybrid rice programme; salt-tolerant rice; drought-resistant varieties	China leads world in hybrid rice: >50% of rice area uses hybrids; yields >10 t/ha achieved

SECTION 4: CROPPING PATTERNS & AGRICULTURAL CALENDAR

4.1 Seasonal Cropping System

Season	Months	Regions	Major Crops
Winter Wheat Planting	Oct–Nov	Huang-Huai-Hai Plain; Yangtze valley	Winter wheat (main season); rapeseed
Spring Planting	Mar–May	Northeast; Northwest; South (early rice)	Maize, soybean, spring wheat, early rice, cotton, peanuts
Summer Harvest	Jun–Jul/Aug	Central/Eastern China	Winter wheat harvest; early rice harvest; summer maize planting
Autumn Harvest	Sep–Nov	Nationwide (south to north)	Maize, rice (middle/late), soybean, cotton, autumn vegetables; accounts for ~75% of total grain
Tropical Year-Round	Year-round	Hainan, Guangdong, Yunnan (S)	Triple-crop rice; tropical fruits; rubber; sugarcane

4.2 Major Food Crops

Maize (Corn)	~294.92 MT (2024 NBS, +2.1% YoY); Area ~44.7M ha; yield ~6.59 t/ha. China’s #1 crop by volume. Heilongjiang, Jilin, Inner Mongolia, Shandong, Henan.
Rice	~207.53 MT (2024 NBS, +0.5%); ~29.0M ha; yield ~7.15 t/ha. World’s largest rice producer. Hunan, Jiangxi, Hubei, Anhui, Heilongjiang (japonica).
Wheat	~140.10 MT (2024 NBS, +2.6% – record); world’s largest wheat producer. Henan, Shandong, Anhui, Hebei, Jiangsu.
Soybean	~20.65 MT (2024 NBS, -0.9%); Heilongjiang is #1 province. China imports ~100M t/year soybean (world’s largest importer).
Potatoes	~90–95 MT/year (FAO/NBS) – world’s largest producer. Inner Mongolia, Gansu, Guizhou, Sichuan, Yunnan.
Sweet Potatoes	~50–55 MT/year (FAO) – world’s largest producer. Sichuan, Chongqing, Henan, Shandong.

4.3 Cash Crops & Industrial Crops

Cotton	~6 MT (2024 NBS, +9.7%); Xinjiang produces ~90% of China’s cotton. World’s 2nd largest producer (after India).
Oil-Bearing Crops	~39.79 MT (2024 NBS, +3.0%); rapeseed, peanuts, sesame, sunflower. Rapeseed: Yangtze valley (Hubei, Hunan, Sichuan). Peanuts: Shandong, Henan.
Sugar Crops	~118.70 MT (2024 NBS, +4.3%); sugarcane (Guangxi ~60%, Yunnan ~20%); sugar beet (Xinjiang, Inner Mongolia). World’s 3rd–4th largest sugar producer.
Tea	~3.74 MT (2024 NBS, +5.5%); world’s largest producer and exporter. Fujian, Yunnan, Zhejiang, Sichuan, Hubei.
Tobacco	~2.0–2.3 MT/year (FAO); world’s largest producer. Yunnan, Guizhou, Henan.

Vegetables	~780–800 MT/year (NBS/FAO); world's largest producer by far. Shandong, Hebei, Henan, Jiangsu. China produces ~50% of world's vegetables.
Fruits	~300–320 MT/year (NBS/FAO); world's largest producer. Apples: Shaanxi, Shandong. Citrus: Jiangxi, Hunan, Sichuan. Bananas: Guangdong, Yunnan.

4.4 Cropping Intensity & Productivity

Total Grain Sown Area (2024)	~119.319 million ha (+0.3% YoY, NBS); cereals: ~100.458M ha (+0.5%)
Total Grain Production (2024)	~706.50 MT (+1.6% – record, first time >700 MT, NBS). Summer grain: ~149.89 MT; early rice: ~28.17 MT; autumn grain: ~528.43 MT.
Grain Yield (2024)	~5,921 kg/ha average (+1.3% YoY, NBS); cereals: 6,493 kg/ha
Cropping Intensity	~130–160% (national avg); South China: 200–300% (double/triple cropping); Northeast: 100% (single crop)
Multiple Cropping Index	Highest in Guangdong/Hainan (triple rice + vegetables); wheat-maize rotation in North China Plain

4.5 Major Crop Varieties and Yield/ha

Crop	Varieties	Avg Yield (t/ha)	Notes
Rice (indica)	Hybrid: Longliangyou, Y-Liangyou, Jing-liangyou series (Yuan Longping Institute); Conventional: Huanghuazhan, Nanjing 9108	~7.15 (2024 NBS avg)	~29.0M ha; >50% area uses hybrids; world leader in hybrid rice technology
Wheat	Jimai 22 (dominant in Huang-Huai-Hai), Bainong AK58, Zhoumai 36, Xinmai 26, Zhengmai 9023	~5 (2024 NBS)	Record ~140.1 MT; Henan + Shandong = ~40% of national wheat
Maize	Zhengdan 958, Xianyu 335 (Pioneer-derived), Yuyu 22, Dika 517, Jingke 968	~6.5 (2024 NBS)	~44.7M ha; record 294.9 MT; higher-yielding varieties driving growth
Soybean	Zhonghuang series, Henong series, Kenfeng series (Heilongjiang breeding)	~1.98 (NBS)	~20.65 MT; self-sufficiency ~15–18% (imports ~100 MT soybean)
Cotton	Xinluzao series (Xinjiang), CCRI series (Chinese Cotton Research Institute)	~1.8–2.0 (lint)	~6.16 MT; Xinjiang ~90%; machine-harvested expanding rapidly
Potatoes	Kexin series, Longshu series, Qingshu 9 (Gansu/Inner Mongolia breeding)	~18–20	~90–95 MT; world's largest; mainly food + starch + feed

SECTION 5: AGRICULTURAL LAND USE & LAND RESOURCES

5.1 Land Use Classification

Total Geographic Area	~960 million ha (9.6 million km ²)
Arable Land	~128–130 million ha (NBS/FAO; 'red line' policy mandates minimum 120M ha / 1.8 billion mu of arable land)
Total Grain Sown Area (2024)	119.319M ha (NBS) – sown area exceeds arable area due to multiple cropping
Permanent Cropland	~15–16 million ha (orchards, tea plantations, vineyards; FAO)
Grassland/Pasture	~393 million ha (~41% of total area; mostly in Inner Mongolia, Tibet, Xinjiang, Qinghai)
Forest Land	~220–230 million ha (forest coverage 24.02%, NBS); afforestation 4.45M ha in 2024
High-Standard Farmland	Over 1 billion mu (~66.7M ha) built by 2024 (MARA); target 1.2 billion mu (80M ha) by 2030

5.2 Irrigation Infrastructure

Irrigated Area	~70 million ha (FAO AQUASTAT/NBS) – world's largest irrigated area. ~55% of arable land is irrigated.
Major Irrigation Systems	South-to-North Water Transfer Project (world's largest; Eastern, Central, Western routes); Yellow River irrigation (Ningxia, Inner Mongolia); Dujiangyan (Sichuan, 2,200 years old)
Irrigation Methods	Flood/furrow (~50–55% – declining); sprinkler (~20%); drip/micro (~25% – expanding rapidly, esp. Xinjiang cotton)
Water Source	Rivers/canals (~65%); reservoirs (~20%); groundwater (~15%). Total water resources: 3,001.0 billion m ³ (2024, NBS Communiqué). Agri water consumption declining -0.7% in 2024.
Key Constraints	North China: severe groundwater overdraft (Hebei 'funnel'); Yellow River water stress; NW: glacier retreat threatening irrigation; pollution in some waterways

5.3 Land Tenure & Farm Structure

System	All agricultural land owned by rural collectives (not private); farmers hold 30-year renewable land-use rights (extended to at least 2057 under 2018 amendment). Land cannot be sold but can be transferred.
Average Farm Size	~0.6–0.7 ha per household (~8–10 mu); among world's smallest. ~200 million farming households.
Land Transfer	Growing: ~40% of arable land is now contracted to larger operators via land transfer (liuzhuan); enables mechanisation
Large-Scale Operators	Family farms (>50 mu), cooperatives (~2.2 million registered), and agricultural enterprises; share of output growing rapidly
Urban-Rural Migration	~300 million rural migrant workers (2024 NBS); hollowing out of farming communities; aging farmer population (avg age >55)

SECTION 6: MAJOR SOIL TYPES, SOIL HEALTH & NUTRIENT MANAGEMENT

6.1 Soil Classification System

System	Chinese Soil Taxonomy (CST, 2001 revision) / also mapped to WRB and USDA Soil Taxonomy. Based on Nanjing Institute of Soil Science / Chinese Academy of Sciences.
Survey Authority	Chinese Academy of Sciences, Institute of Soil Science (Nanjing); National Soil Census (3rd national soil census underway 2022–2025)

6.2 Major Soil Types

Soil Type	Region	Properties	Suitable Crops
Black Soil (Chernozem)	Northeast (Heilongjiang, Jilin)	Fertile; 3–6% organic matter; deep humic layer; acidifying	Maize, soybean, rice, wheat – China's most productive farmland
Paddy Soil (Anthrosol)	Yangtze valley, South China	Man-made from centuries of rice cultivation; gleyed; high organic matter	Rice (primary); rapeseed (rotation)
Yellow-Brown Earth	Central China (Hubei, Henan, Anhui)	Moderate fertility; loamy; slightly acidic	Wheat-rice/maize rotation; rapeseed
Red Soil (Ferralsol)	South China (Jiangxi, Hunan, Fujian, Guangdong)	Acidic (pH 4.5–5.5); leached; low P/Ca; iron-rich	Tea, citrus, rice, sugarcane – needs heavy liming/P
Loess Soil	Loess Plateau (Shaanxi, Gansu, Shanxi)	Deep (up to 300m); erodible; moderate fertility	Wheat, millet, potatoes, apples – severe erosion risk
Desert/Sandy Soil	Xinjiang, W. Inner Mongolia, Gansu (Gobi)	Infertile; no OM; saline; requires irrigation	Cotton, melons, grapes (irrigated oases only)
Alpine Meadow	Tibetan Plateau, Qinghai	Thin, cold soils; permafrost influence; low OM; fragile ecosystem	Grazing only (yak, sheep); highland barley

6.3 Soil Degradation & Conservation

Black Soil Degradation	Northeast black soil losing ~1 cm topsoil/year; OM declining from 6% to 2–3%. 'Black Soil Protection Law' enacted 2022 – first dedicated legislation globally.
Erosion	~300 million ha affected by water/wind erosion (Ministry of Water Resources). Loess Plateau erosion historically among world's worst – improved by 'Grain for Green' programme.
Contamination	~16% of agricultural soil contaminated (2014 national survey, Ministry of Ecology & Environment); cadmium, arsenic, mercury in some paddy soils (Hunan/Jiangxi).
Salinisation	~10 million ha saline-alkaline soils (coastal, NW); government promoting salt-tolerant rice/wheat varieties.

Conservation Programs	Black Soil Protection Action Plan (2020); Grain for Green (Tuigeng Huanlin, since 1999): ~33M ha converted from marginal farmland to forest/grassland; 3rd National Soil Census (2022–2025)
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SECTION 7: LIVESTOCK SECTOR PROFILE

7.1 Livestock Population & Production

Total Meat (2024)	~96.63 MT of pork, beef, mutton and poultry (NBS, +0.2% YoY) – world’s largest meat producer
Pork	~57.06 MT (2024 NBS, -1.5%); 702.56M pigs slaughtered (-3.3%); 427.43M in stock at year-end (-1.6%). China produces ~45% of world’s pork.
Poultry Meat	~26.60 MT (2024 NBS, +3.8%) – world’s 2nd largest after US
Beef	~7.79 MT (2024 NBS, +3.5%) – world’s 3rd largest producer
Mutton/Lamb	~5.18 MT (2024 NBS, -2.5%) – Inner Mongolia, Xinjiang, Gansu, Ningxia
Eggs	~35.88 MT (2024 NBS, +0.7%) – world’s largest egg producer by far
Milk	~40.79 MT (2024 NBS, -2.8%) – Inner Mongolia, Heilongjiang, Hebei, Henan. Top companies: Yili, Mengniu (both among global top 10 dairy).

7.2 Key Livestock Regions

Pigs	Sichuan (#1), Henan, Hunan, Shandong, Hubei, Guangdong. Major companies: Muyuan (#1, ~68M pigs/year), Wen’s Group, New Hope Liuhe, Zhengbang.
Poultry	Shandong, Henan, Guangdong, Jiangsu, Anhui. Broiler companies: Sunner, Shengnong, CP Group China, Fengxiang.
Dairy	Inner Mongolia (‘Milk Capital’: Yili + Mengniu HQ in Hohhot), Heilongjiang, Hebei, Shandong, Henan.
Beef Cattle	Inner Mongolia, Sichuan, Yunnan, Guizhou, Jilin, Hebei.
Sheep/Goats	Inner Mongolia, Xinjiang, Sichuan, Tibet, Gansu, Ningxia – ~300M+ sheep/goats total (FAO).

7.3 Livestock Production Summary

Sector	Key Info	Major Regions	National Production (2024 NBS)
Pork	World’s #1 producer; ~45% of global output; ASF recovery since 2021	Sichuan, Henan, Hunan, Shandong, Hubei	57.06 MT; 702.56M pigs slaughtered
Poultry Meat	World’s #2 producer; includes chicken, duck, goose	Shandong, Henan, Guangdong, Jiangsu	26.60 MT (+3.8%)
Beef	World’s #3 producer; rapidly growing	Inner Mongolia, Sichuan, Yunnan, Jilin	7.79 MT (+3.5%)
Mutton/Lamb	World’s top producer; pastoral + feedlot	Inner Mongolia, Xinjiang, Gansu, Ningxia	5.18 MT (-2.5%)
Eggs	World’s #1 by far; ~40% of global production	Shandong, Henan, Hebei, Hubei, Jiangsu	35.88 MT (+0.7%)
Milk	Growing sector; top dairy companies are global players	Inner Mongolia, Heilongjiang, Hebei, Henan	40.79 MT (-2.8%)

SECTION 8: FISHERIES & AQUACULTURE SECTOR

8.1 Resource Base

Coastline	~18,000 km mainland; ~32,000 km incl. islands
EEZ	~877,019 km ² (South China Sea, East China Sea, Yellow Sea, Bohai Sea)
Inland Waters	Vast: Yangtze, Yellow, Pearl river systems; Poyang Lake, Dongting Lake; ~200 million ha of freshwater resources

8.2 Production Statistics

Total Aquatic Production (2024)	~73.58 MT (MARA, +12.3% vs 2020) – world’s largest for 36th consecutive year
Aquaculture (2024)	~60.60 MT (MARA Fishery Statistics Bulletin 2024, +4.31% YoY) – accounts for ~82% of total. Freshwater: ~36.49 MT; Marine: ~24.11 MT.
Wild Caught (2024)	~12.9–13.3 MT (NBS/MARA) – effectively flat; ocean catch declining under fishing moratoriums
Key Aquaculture Species	Carp (grass, bighead, silver, crucian – ~18.7 MT); shrimp (<i>Penaeus vannamei</i> – ~2.24 MT); crayfish (~3.2 MT); shellfish (~16.7 MT); tilapia; salmon/trout (growing)
Aquaculture Area (2024)	~7.568 million ha (MARA; marine: ~2.24M ha; freshwater: ~5.33M ha)
Per Capita Availability	~52.25 kg/year (2024, MARA) – well above global avg of ~20 kg
Distant-Water Fisheries	~2.19 MT (2024, MARA, -5.74%); operates worldwide; regulatory pressure increasing
Key Provinces	Shandong, Fujian, Guangdong (marine); Hubei, Jiangsu, Hunan, Anhui (freshwater)

SECTION 9: GOOD AGRICULTURAL PRACTICES & SUSTAINABLE FARMING

9.1 GAP Certification & Standards

National Standards	China Good Agricultural Practice (ChinaGAP, GB/T 20014 series); Green Food Certification (China Green Food Development Center); Organic Product Certification (national standard GB/T 19630)
International	GlobalG.A.P. adopted by export-oriented farms; ISO 22000 in major processors; HACCP mandatory for export food processing
Green Food	Over 45,000 ‘Green Food’ certified products; area: >200 million mu (~13.3M ha); annual output value >RMB 600 billion
Organic	China is among world’s top 5 countries by organic farmland area (~3.5–4.0M ha); organic market >\$10 billion

9.2 Integrated Pest Management

National System	National Agro-Tech Extension Service Center (NATESC) under MARA; provincial plant protection stations in every province; locust/armyworm/aphid monitoring
Key Programmes	Fall Armyworm surveillance (since 2019 invasion); rice planthopper forecasting; wheat stripe rust monitoring (NW/SW China); biological control expanding
Pesticide Regulation	‘Zero Growth in Pesticide Use’ action plan since 2015; pesticide application decreased 1.5% from 2020 levels (MARA 2024); banned highly toxic pesticides on food crops

9.3 Post-Harvest Management

Grain Storage	National strategic grain reserves managed by Sinograin (China Grain Reserves Corp.); provincial and county-level reserves; total capacity among world’s largest; modern grain depots with temperature/humidity control
Cold Chain	Rapidly expanding: China’s cold chain logistics market >RMB 500 billion; cold storage capacity ~180–200 million m ³ ; still inadequate for fruits/vegetables – ~15–20% post-harvest loss for perishables
Food Processing	Massive sector: agricultural product processing revenue ~RMB 18 trillion (2024, MARA). Major companies: COFCO (#1, state-owned), WH Group (pork), Shuanghui/Smithfield, Yili, Mengniu, New Hope.

9.4 Farm Mechanisation

Mechanisation Rate	Comprehensive crop mechanisation rate: ~75% nationally (2024, MARA); >95% for wheat, >90% for rice and maize planting/harvesting
Tractor Fleet	~20 million tractors (NBS); China is world’s largest agricultural machinery producer and user
Combine Harvesters	~2–3 million combines; domestic manufacturers dominate: Lovol (Foton), Zoomlion Agriculture, YTO Group, Kubota China, John Deere China

Drones	China leads globally in agricultural drone use: ~200,000+ operational crop-spraying drones; DJI Agras series dominates; XAG (Jifei); ~2.67 billion mu sprayed by drone (2024)
Precision Agriculture	BeiDou satellite navigation system (Chinese GPS) for precision guidance; autonomous tractors/harvesters in pilot deployment; smart farming demonstrations in >500 counties

SECTION 10: AGRICULTURAL EXPORT COMMODITIES & TRADE

10.1 Trade Profile

Agricultural Exports (2024)	~\$100 billion (MARA/Customs) – includes processed foods, aquatic products, vegetables, tea, fruits
Agricultural Imports (2024)	~\$215 billion – China is world’s largest agricultural importer. Dominated by soybean (~\$50–60B), meat, dairy, grains, palm oil.
Trade Balance	Persistent agricultural trade deficit (~\$112 billion/year); structural importer of land-intensive crops (soybean, grains)
Top Import: Soybean	~105 MT/year imports (world’s largest); mainly from Brazil, US, Argentina. For animal feed (soybean meal) and cooking oil.
Grain Self-Sufficiency	Grain (rice + wheat + maize): >95% self-sufficient; but feed grains (maize, barley, sorghum) increasingly imported

10.2 Top Agricultural Export Products

Rank	Commodity	Description	Key Destinations
1	Aquatic/Seafood Products	World’s largest seafood exporter by volume; processed fish, shrimp, crab, squid	Japan, US, EU, South Korea, ASEAN
2	Vegetables (Fresh/Processed)	World’s largest vegetable exporter; garlic, mushrooms, ginger, preserved vegetables	Japan, ASEAN, EU, US, Russia
3	Tea	World’s largest tea producer (3.74 MT) and exporter	Morocco, Uzbekistan, Ghana, Russia, EU
4	Fruits (Fresh/Processed)	Apples, citrus (mandarins), pears, grapes; canned/dried fruits	ASEAN, Russia, EU, Middle East
5	Prepared/Processed Foods	Noodles, sauces, canned goods, snacks, condiments	ASEAN, Japan, South Korea, US, EU
6	Animal Casings/Products	Hog casings (world’s largest), feathers, down, pet food ingredients	EU, US, Japan
7	Poultry Meat (Cooked)	Processed/cooked poultry products (heat-treated)	Japan, EU (authorized plants), Middle East
8	Cotton Textiles/Products	Processed cotton products (not raw cotton – China is net importer of raw cotton)	Global

10.3 Export Challenges & Opportunities

Challenges	SPS barriers (pesticide residues, food safety); US-China trade tensions/tariffs; EU deforestation regulation impacting soy/palm supply chains; logistics costs; reputation for food safety inconsistency
Opportunities	Belt and Road Initiative (BRI) expands agricultural trade corridors; RCEP (largest FTA, effective 2022); growing demand in Global South; ‘Dual Circulation’ policy; e-commerce for agricultural products (Alibaba/Pinduoduo)

SECTION 11: COMMERCIAL & EMERGING TECHNOLOGIES

11.1 Digital & Precision Agriculture

BeiDou Navigation	Chinese global navigation satellite system (BDS); used for precision planting/harvesting guidance; >500,000 agricultural vehicles equipped
AI/Big Data	Alibaba Cloud ET Agricultural Brain; Pinduoduo’s Smart Agriculture; JD.com farm AI; government ‘Digital Village’ initiative covering >60% of villages
Drones	World leader: DJI Agras T50/T25; XAG P150; >200,000 crop-spraying drones operational; >600 million mu sprayed (2024); regulatory framework mature
IoT/Sensors	Greenhouse sensor networks; soil moisture monitoring; livestock tracking (ear tags/RFID); smart aquaculture monitoring (water quality, feeding)

11.2 Biotechnology & Crop Improvement

GM Crop Status	China approved commercial planting of GM insect-resistant cotton (1997, Bt cotton covers ~90% of cotton area). GM papaya approved. First-ever approval for GM insect-resistant maize and herbicide-tolerant soybean planting granted in 2023 (Dabeinong/Syngenta China varieties) – commercial expansion expected from 2024/25.
Hybrid Rice	China’s signature technology: Yuan Longping’s super hybrid rice programme; 3rd generation hybrids achieving >10 t/ha; China’s hybrid rice covers >50% of rice area.
Gene Editing	Active research at CAAS, Chinese Academy of Sciences, universities; CRISPR-Cas9 widely used; regulatory framework evolving (gene editing classified under GMO regulation since 2022)
Seed Industry	National Seed Industry Revitalisation (2021); domestic seed self-sufficiency >95% for staples, 30% for footage seeds; major companies: Longping High-Tech (rice), Syngenta Group China (formerly ChemChina/Syngenta), CITIC Agriculture, Dabeinong.

11.3 Protected Cultivation & Controlled Environment

Greenhouse Area	~3.7–4.0 million ha under protected cultivation (world’s largest by far); includes: solar greenhouses (Chinese-style, Liaoning/Shandong), plastic tunnels, multi-span glasshouses
Major Regions	Shandong (Shouguang – ‘vegetable capital’), Liaoning, Hebei, Henan, Jiangsu, Yunnan (flowers)
Technology	Solar greenhouses (north wall heat storage – uniquely Chinese design for winter production without heating); Dutch-type Venlo glasshouses for high-end; soilless/hydroponic expanding; vertical farming pilots in Beijing, Shanghai
Production	Greenhouse vegetables: ~250–280 MT/year (major contributor to year-round vegetable supply); Shouguang alone: ~4.5 million tonnes/year

11.4 China-India Agricultural Technology Exchange

Innovation	Sector	China Strength	India Application	Impact
Hybrid Rice	Crop Science	Yuan Longping hybrids; >50% of China rice area; exported to 80+ countries	India's eastern states (Bihar, UP, WB) where yield gaps exist	Potential to boost Indian rice yields by 15–20%
Agricultural Drones	Farm Mechanisation	World's #1: DJI/XAG; 200,000+ drones; 600M mu sprayed	India's fragmented farms need low-cost precision spraying	Labour-saving; reduced pesticide exposure; cost-effective
Solar Greenhouse Technology	Protected Cultivation	Chinese solar greenhouse design (no heating needed in -20°C); 3.7M+ ha	India's northern plains / Himalayan states for off-season vegetables	Year-round production in J&K, HP, Uttarakhand; energy-efficient
Aquaculture Intensification	Fisheries	World's #1: 60.6 MT aquaculture; carp polyculture; shrimp	India's 8M+ ha of freshwater potential; Andhra, WB, Bihar	Technology for intensification; feed formulation; disease management
E-Commerce for Agriculture	Digital	Alibaba/Pinduoduo rural e-commerce; >60% of villages connected	India's farm-to-consumer direct channels; ONDC platform	Last-mile delivery models; cold chain logistics for perishables
Soybean Processing	Agro-Industry	World's largest soybean crusher (~100 MT imported/year); advanced extraction	India's growing oilseed processing sector; MP, Maharashtra	Processing efficiency; value addition to domestic soybean crop

SECTION 12: FOOD SECURITY & NUTRITION

12.1 Production Overview

Total Grain (2024)	706.50 MT (NBS, record – first time >700 MT). Rice: 207.53 MT; Wheat: 140.10 MT; Maize: 294.92 MT; Soybean: 20.65 MT.
Total Meat (2024)	96.63 MT (NBS); pork: 57.06 MT; poultry: 26.60 MT; beef: 7.79 MT; mutton: 5.18 MT.
Total Eggs (2024)	35.88 MT (NBS)
Total Milk (2024)	40.79 MT (NBS)
Aquatic Products (2024)	73.58 MT (MARA); aquaculture: 60.60 MT
Total Meat + Eggs + Dairy (2024)	~175 MT combined (+18.8% vs 2020, MARA)
Per Capita Grain Availability	~500 kg/year (well above global avg ~340 kg)
Per Capita Meat Consumption	~71 kg/year (2024, MARA) – above global avg
Per Capita Aquatic Products	~52.25 kg/year (production based) (2024, MARA) – well above global avg ~20 kg

12.2 Food Security & Nutrition

National Status	Food-secure at national level; grain self-sufficiency >95% for rice/wheat/maize. China feeds ~18% of world's population on ~7–8% of world's arable land.
Food Security Strategy	National Food Security Strategy: 'Chinese rice bowls must be held firmly in Chinese hands'; Food Security Law (effective June 2024); strategic grain reserves (one of world's largest).
Soybean Vulnerability	Major import dependency: ~100 MT soybean/year (self-sufficiency ~15–18%); mostly from Brazil/US. National campaign to expand domestic soybean production.
Undernourishment	<2.5% (FAO – below threshold). China has lifted ~800 million people out of poverty since 1978.
Overweight/Obesity	Growing public health concern: >50% of adults overweight/obese (Chinese CDC 2020); particularly urban populations. Diabetes prevalence ~11–12%.
Food Waste	'Clean Plate' campaign (2020); Anti-Food Waste Law (2021); estimated 35 MT food wasted annually in catering sector (Chinese Academy of Sciences study)

SECTION 13: KNOWLEDGE EXCHANGE – BEST PRACTICES

13.1 What China Can Offer BRICS Nations

#	Achievement	Description
1	World's #1 Grain Producer	706.5 MT grain (2024); feeds 1.4 billion on 7–8% of world's arable land; rice/wheat/maize self-sufficient
2	Hybrid Rice Technology	Yuan Longping's super hybrid rice exported to 80+ countries; >50% of China's rice area uses hybrids; yields >10 t/ha
3	World's #1 Aquaculture Producer	60.6 MT aquaculture (2024); carp polyculture, shrimp, shellfish; 36 years as world's #1
4	Agricultural Drone Revolution	200,000+ drones; 600M+ mu sprayed; DJI/XAG technology exported globally
5	Solar Greenhouse Technology	Uniquely Chinese design; 3.7M+ ha protected cultivation; year-round vegetable production in cold climates without heating
6	Poverty Alleviation Model	'Targeted Poverty Alleviation' lifted 98.99 million rural poor out of poverty (2012–2020); industrial + agricultural approach
7	Digital Agriculture / E-Commerce	Rural e-commerce: Alibaba's Taobao Villages; Pinduoduo; direct farm-to-consumer; >60% of villages connected
8	High-Standard Farmland	66.7M ha (1 billion mu) built; comprehensive land improvement: irrigation, drainage, soil, roads; yields +10–20%

13.2 What China Can Learn from BRICS

#	Area	From	Opportunity
1	Tropical Agriculture	India, Brazil, Ethiopia	China imports tropical products heavily; knowledge of sugarcane, spices, coffee, cocoa from BRICS tropics
2	Rainfed Agriculture	India, South Africa, Ethiopia	~45% of China's farmland is rainfed; India's ICAR dryland research applicable to NW China
3	Organic/Certification	India, Brazil	India: 4.7M+ ha organic; Brazil's organic soya; China's organic market still developing certification credibility
4	Beef Cattle Genetics	Brazil, Argentina (via BRICS)	China's beef sector relatively inefficient; Brazil's Nelore/Angus genetics; feedlot efficiency
5	Conservation Agriculture	Brazil, South Africa	Brazil's no-till soybean systems; SA's conservation farming; applicable to China's degrading black soil
6	Cooperative Dairy Models	India	India's AMUL/NDDDB cooperative model for smallholder dairy; applicable to China's millions of small dairy farmers
7	Soil Carbon Trading	Brazil, EU (via South Africa)	Brazil's Renovagro; carbon credit markets; China exploring but still nascent
8	Rangeland Management	South Africa, Ethiopia	SA's game ranching; Ethiopia's pastoralist development; for China's 393M ha grasslands in Inner Mongolia/Tibet

13.3 Agro-Climatic Matching – China-India

China Region	India State	Climate	Crops	Tech Transfer
Yangtze Valley (Hubei/Hunan)	Bihar/UP/WB	Subtropical monsoon; paddy-dominant	Rice, rapeseed, freshwater fish	Hybrid rice varieties; carp polyculture; rapeseed tech
North China Plain (Henan/Shandong)	Punjab/Haryana/MP	Warm temperate; irrigated	Wheat-maize; vegetables; peanuts	Wheat varieties (Jimai 22); vegetable greenhouse tech; drip irrigation
Northeast (Heilongjiang)	Punjab (winter wheat)	Cold continental; single crop	Maize, soybean, japonica rice	Soybean breeding; cold-tolerant rice; precision agriculture
Xinjiang	Rajasthan/Gujarat	Arid; irrigated oases	Cotton, grapes, melons	Drip irrigation for cotton; machine harvesting; water-saving tech
Yunnan/Guangxi	Kerala/Karnataka/NE India	Tropical/subtropical highlands	Tea, rubber, tropical fruits, sugarcane	Tea processing technology; rubber cultivation; tropical fruits
Sichuan Basin	Assam/WB	Humid basin	Rice, pigs, vegetables, rapeseed	Pig breeding (Muyuan scale model); rapeseed; greenhouse tech

SECTION 14: REFERENCES & DATA SOURCES

14.1 Primary Data Sources

NBS	National Bureau of Statistics of China – GDP, population, grain output, livestock, sown areas, Statistical Communiqué 2024. stats.gov.cn/english/
MARA	Ministry of Agriculture and Rural Affairs – crop data, livestock policy, fisheries statistics, Green Food, extension. moa.gov.cn
USDA-FAS Beijing	Foreign Agricultural Service – GAIN reports on grains, livestock, fisheries, oilseeds, GM crops. fas.usda.gov
FAOSTAT	Production, trade, land use statistics. faostat.fao.org
FAO AQUASTAT	Irrigation and water resources. fao.org/aquastat
IMF WEO	GDP, per capita. imf.org/weo (October 2025)
World Bank WDI	Population, arable land, agri value added. data.worldbank.org
CAAS	Chinese Academy of Agricultural Sciences – research, breeding, technology. caas.cn
CMA	China Meteorological Administration – climate data, agro-meteorological services. cma.gov.cn
UNDP HDR	Human Development Index. hdr.undp.org
ISAAA	GM crop adoption data. isaaa.org
Sinograin	China Grain Reserves Corporation – strategic grain storage

14.2 Glossary

Term	Definition
Mu	Chinese unit of area: 1 mu = 1/15 hectare = 666.7 m ² . 15 mu = 1 hectare.
NBS	National Bureau of Statistics of China
MARA	Ministry of Agriculture and Rural Affairs
CAAS	Chinese Academy of Agricultural Sciences
ChinaGAP	China Good Agricultural Practice (national GAP standard)
Green Food	Chinese food quality certification system (higher than ‘pollution-free’, lower than ‘organic’)
Sinograin	China Grain Reserves Corporation – manages national strategic grain reserves
BeiDou/BDS	Chinese global navigation satellite system (equivalent to GPS); used for precision agriculture
Liuzhuan	Land transfer/contracting system allowing farmers to lease out land-use rights to larger operators
Tuigeng Huanlin	‘Grain for Green’ programme – converting marginal farmland to forest/grassland since 1999

END OF REPORT