



清华大学
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Innovation Without Borders, Ecosystem for All ——Together, Building a Sustainable Innovation Ecosystem

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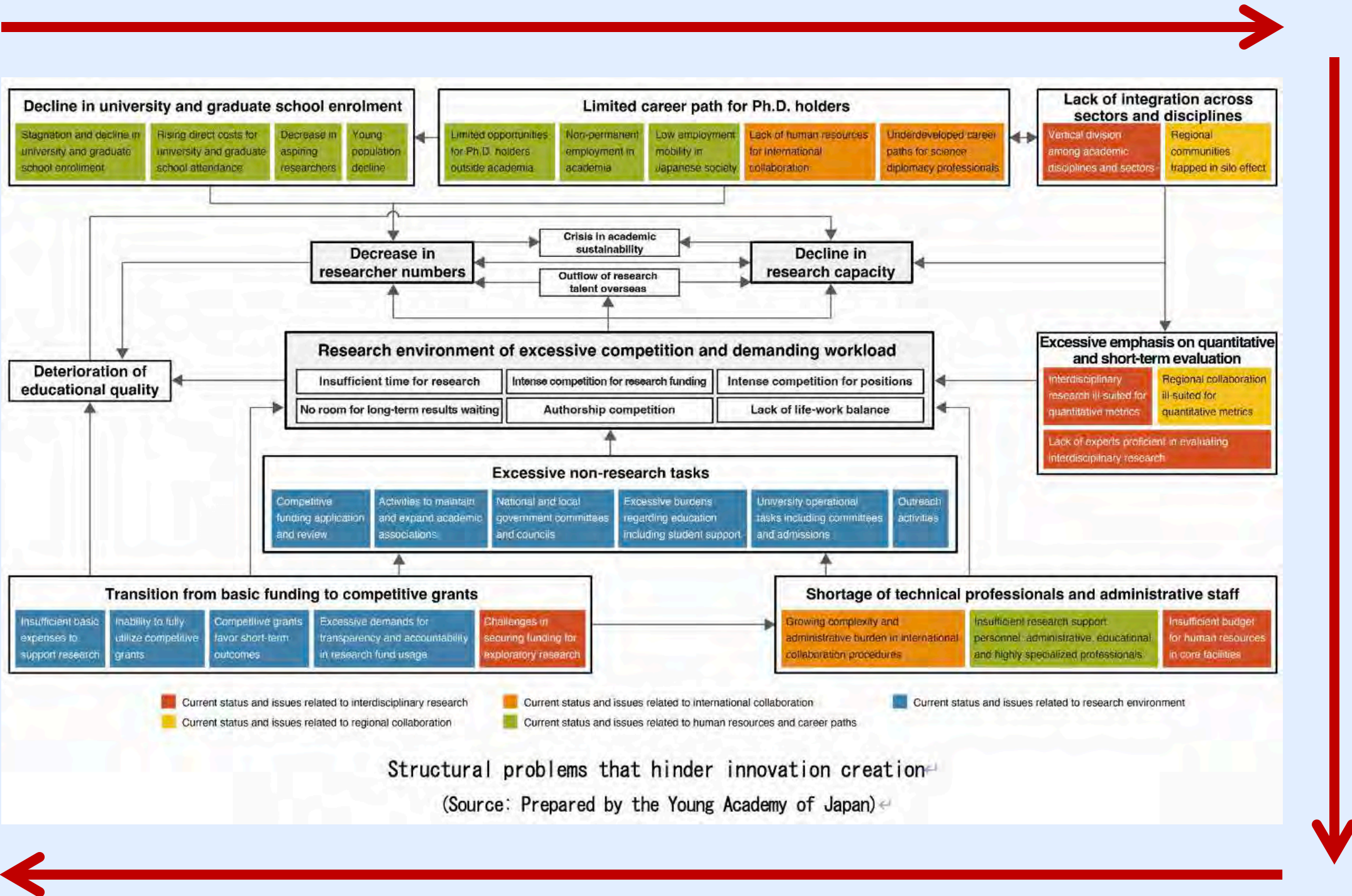
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Table of contents

- 1. Challenges in China
- 2. What we should do
- 3. What we need



Structural problems that hinder innovation creation

(Source: Prepared by the Young Academy of Japan)



Challenges in PhD training in China

Expand doctoral enrollment



Quality of Ph.D. holders

Expand doctoral enrollment



Number of qualified supervision

Ambiguous reasons for pursuing a doctorate



Academic passion and enthusiasm

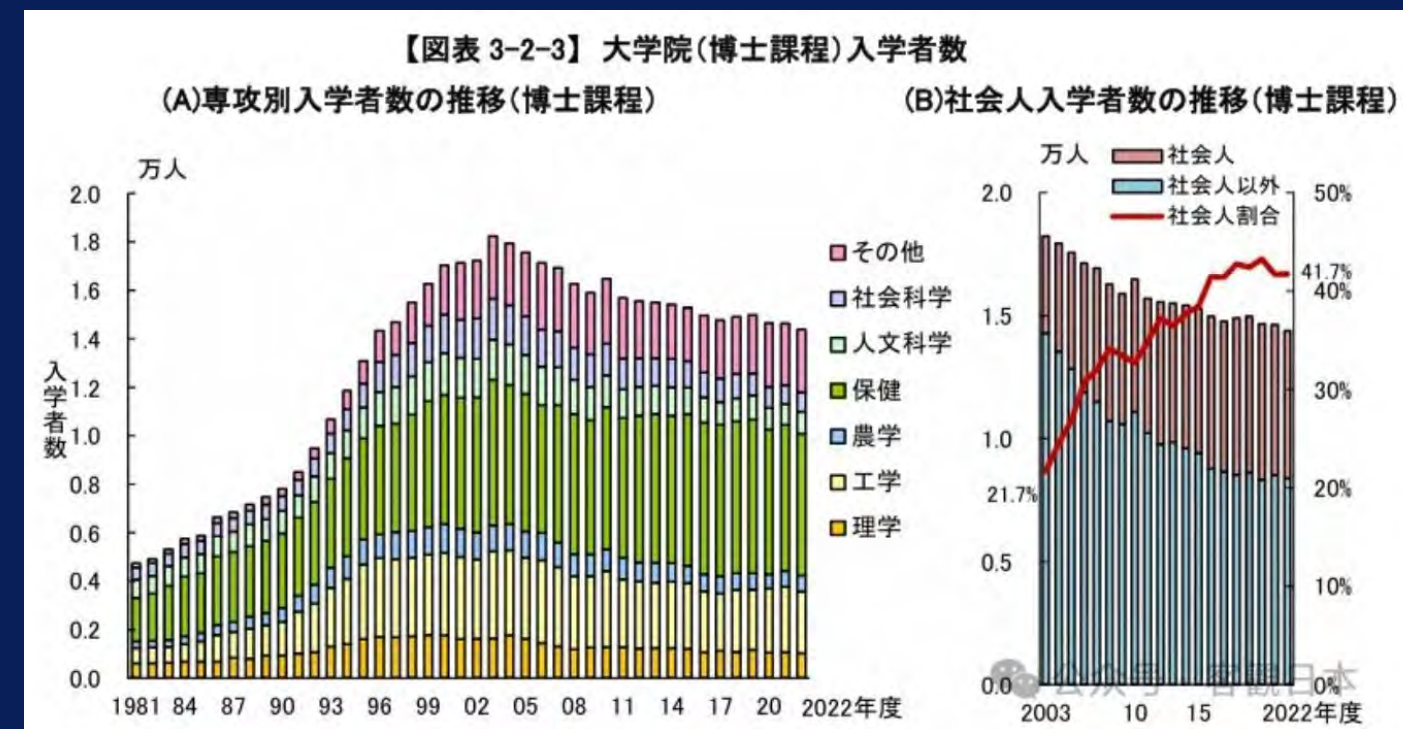
Data in Japan

5,649 in 2022

Researchers per million people
US (4,932); Korea (9,467)

18.5% in 2023

% female researchers
Highest on record



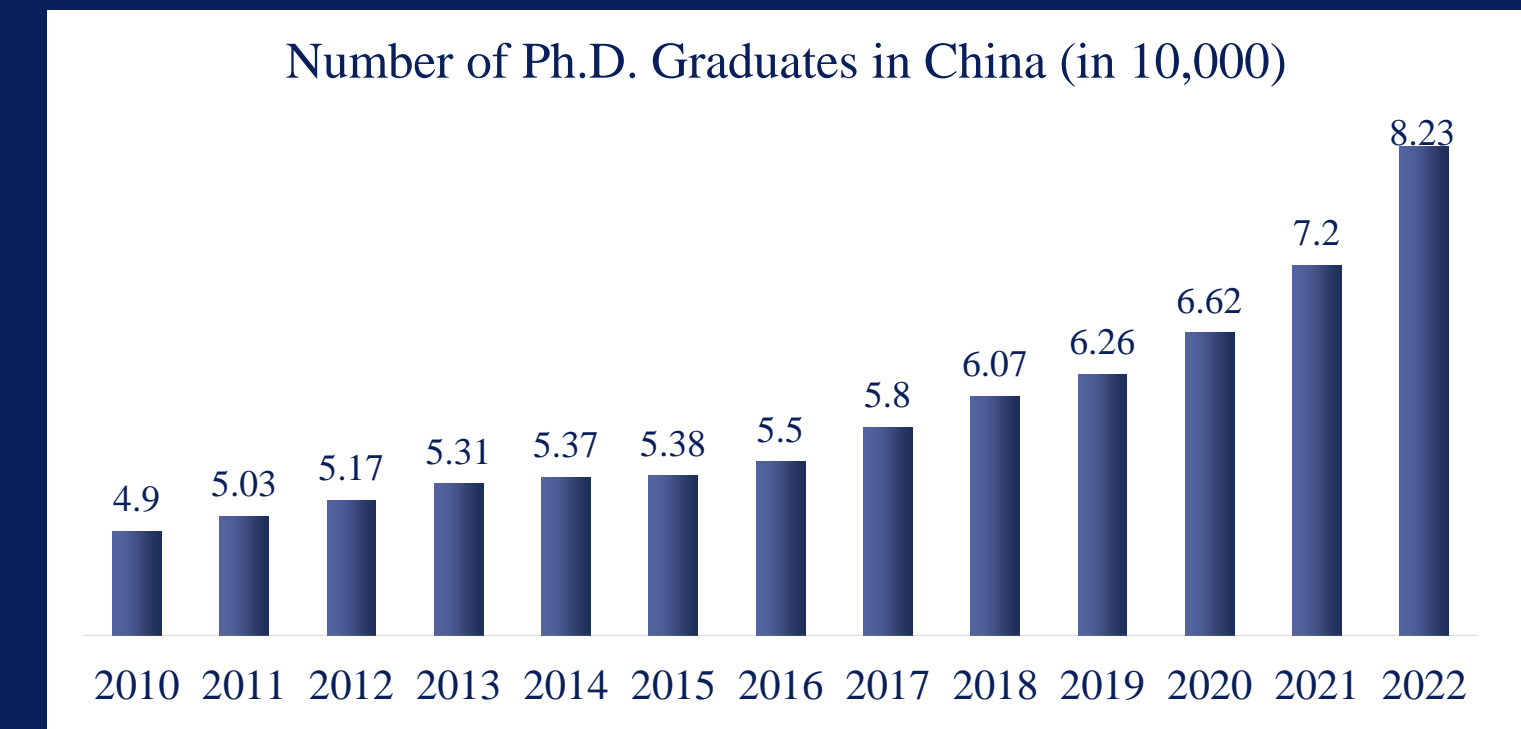
Data in China

1,868 in 2022

Researchers per million people
US (4,932); Korea (9,467)

45.0% in 2024

% female researchers
US (36%); Korea (28.3%)

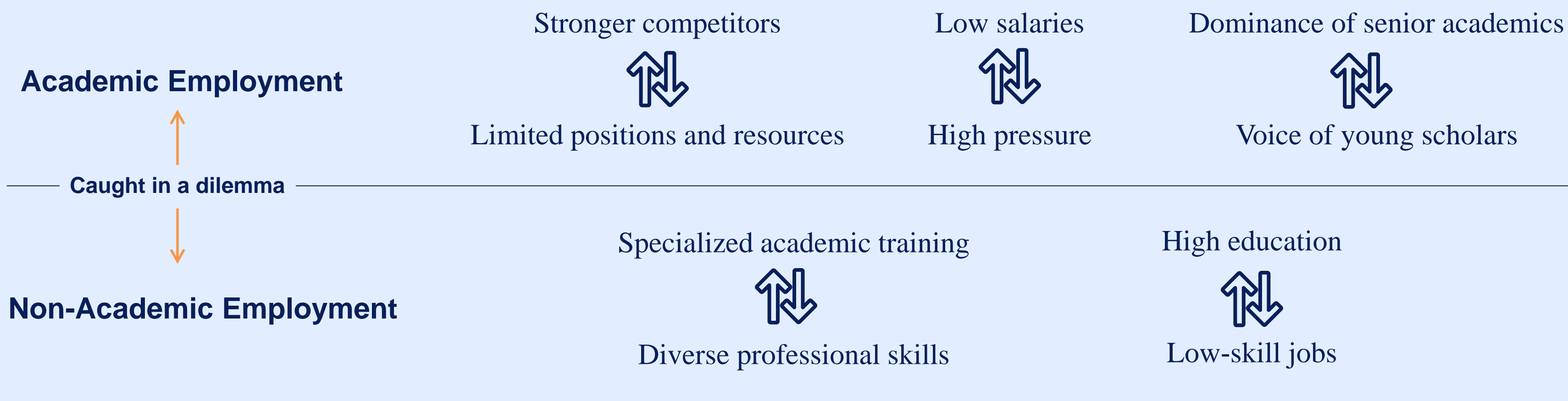


DATA SOURCE: National Bureau of Statistics of China; Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan, etc.

(1) https://tech.cnr.cn/gstj/20241208/t20241208_527002467.shtml (2) <https://export.shobserver.com/baijiahao/html/811424.html>

(3) https://mp.weixin.qq.com/s?__biz=MzIxNzU1MTc2NA==&mid=2247525809&idx=1&sn=3e480e78095e5a968251333026108f80&chksm=97fa234aa08daa5cf802962097aca22a57ad2e97bafb077e3e4e0a41c9ca90f743d50701b036&scene=21#wechat_redirect

Challenges in PhD employment in China



Destination of employment in Japan	2012 (%)	2015 (%)	2018 (%)
Universities and junior colleges	48.2	52.3	51.7
Corporations	26.2	24.7	27.2
Public research institutions	10.4	8.8	8.4
Self-employed	3.7	3.3	3.0
Non-profit organizations	2.0	7.9	7.3
Others	9.5	3.0	2.4

Destination of employment in China	2016 (%)	2018 (%)	2020 (%)
Universities and junior colleges	52.7	54.0	58.0
Corporations	16.3	18.2	17.5
Public research institutions	13.5	12.1	11.0
Government departments	10.6	10.3	9.2
Others	6.9	5.4	4.2

DATA SOURCE: (1) Huang, F. (2024). Changes in doctoral graduates' employment and doctoral students' views of their future career in Japan in 2012–2018. Higher Education Quarterly, 78(2), 458-472.
(2) https://www.thepaper.cn/newsDetail_forward_16602637

Challenges in integration in China



Lack of cooperation mechanisms and platforms



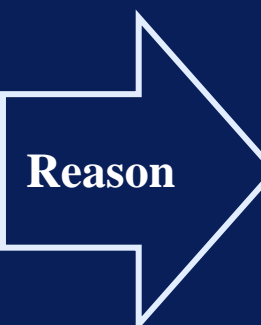
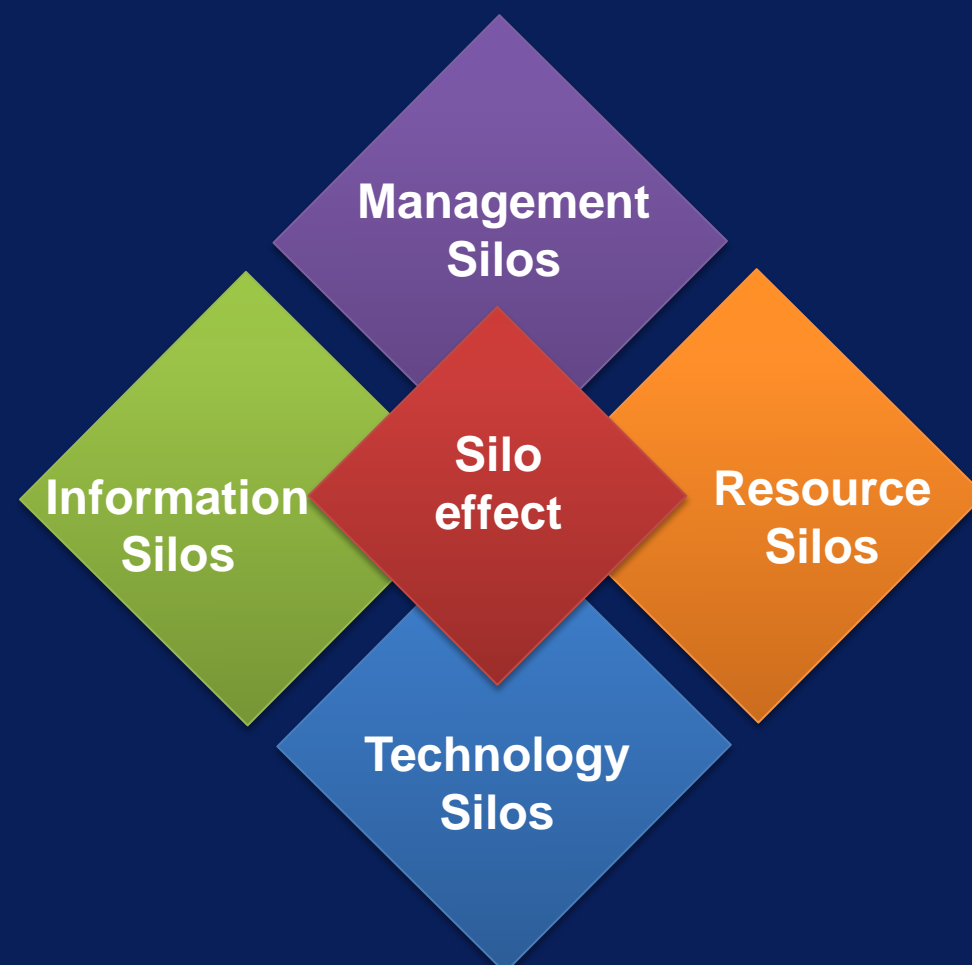
Lack of demand-driven innovation policy system



The leading role of enterprises in innovation is not prominent



The science and technology project does not prioritize economic outcomes



Lack of technology commercialization

While China's patent applications surpassed those of the U.S. in 2011, its exports of high-tech products under domestic brands account for less than 10%, ranking only ninth among G20 countries. (OECD, 2014)



Sustainable innovation chain

Scientific foundation

Technology development

Transformation of scientific and technological achievements

Economic output

Challenges in evaluation in China



Evaluation of research outcomes



Government-driven priorities



Lack of Differentiation in Evaluating Basic and Applied Research

Evaluation of researcher performance



Complex evaluation metrics



Output-Driven Metrics Encourage Short-Term Results

Annual publications

Country	year	Total	%	Rank	Top 10%	%	Rank	Top 1%	%	Rank
China	2019-2021	464077	24.6	1	54405	28.9	1	5516	29.3	1
	2009-2011				10583	9.3	2	836	7.4	2
	1999-2001				1493	2.0	10	98	1.3	13

Publications in the first half of 2024

Country	Nature	Science	Cell	Total	%
China	85	66	31	182	16.2
USA	295	154	87	539	47.8

Breaking the “Four Exclusives”
(focusing only on publications, titles,
degrees, and awards)

2018

Breaking the “SCI supremacy”

2020

New interdisciplinary review panels
for national-level project applications

2025

DATA SOURCE: (1) https://www.keguanjp.com/kgjp_jiaoyu/kgjp_jy_gdgy/pt20230823000002.html; (2) <https://www.toutiao.com/article/7385728213261058572/?wid=1737344221429>

Challenges in non-research tasks in China

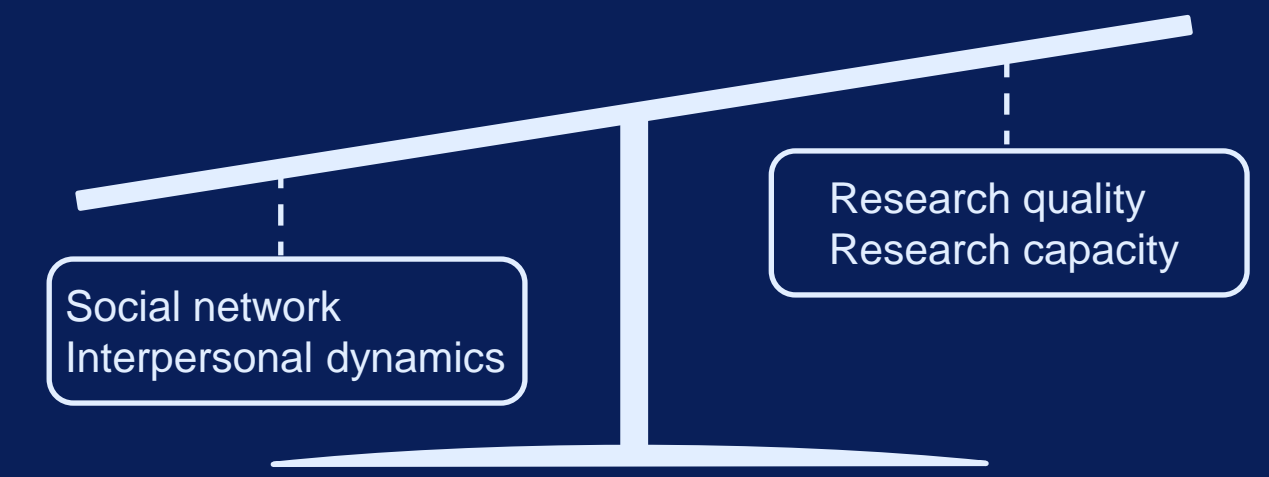
Internally

Researchers have taken on many tasks meant for administrative staff



Externally

Researchers need to spend a lot of energy on networking



The proportion of work hours spent by Japanese researchers in 2018

Types of work activities	Proportion
Research	32.9%
Teaching	28.5%
Community service	20.6%
Campus affairs, etc.	18.0%

The proportion of work hours spent by Chinese researchers in 2017

Types of work activities	Proportion
Research	35.0%
Teaching	27.3%
Non teaching/research activities	36.0%

The proportion of work hours spent by US researchers in 2008

Types of work activities	Proportion
Research	35.7%
Teaching	31.7%
Service	24.4%
Grant writing	8.2%

DATA SOURCE: (1) https://www.keguanjp.com/kgjp_jiaoyu/kgjp_jy_gdjy/pt20190712060003.html;
 (2) <http://www.cppcc.gov.cn/zxww/2017/03/14/ARTI1489458574090204.shtml>
 (3) Link, A. N., Swann, C. A., & Bozeman, B. (2008). A time allocation study of university faculty. Economics of education review, 27(4), 363-374.

Challenges in funding in China



Funding Investment



Per capita research funding remains insufficient.



More investment is needed in basic research

Funding Management



Funding is concentrated in government or policy-driven sectors



Highly bureaucratic

Comparison of China and Japan's research funding in 2023 (100 million yen)

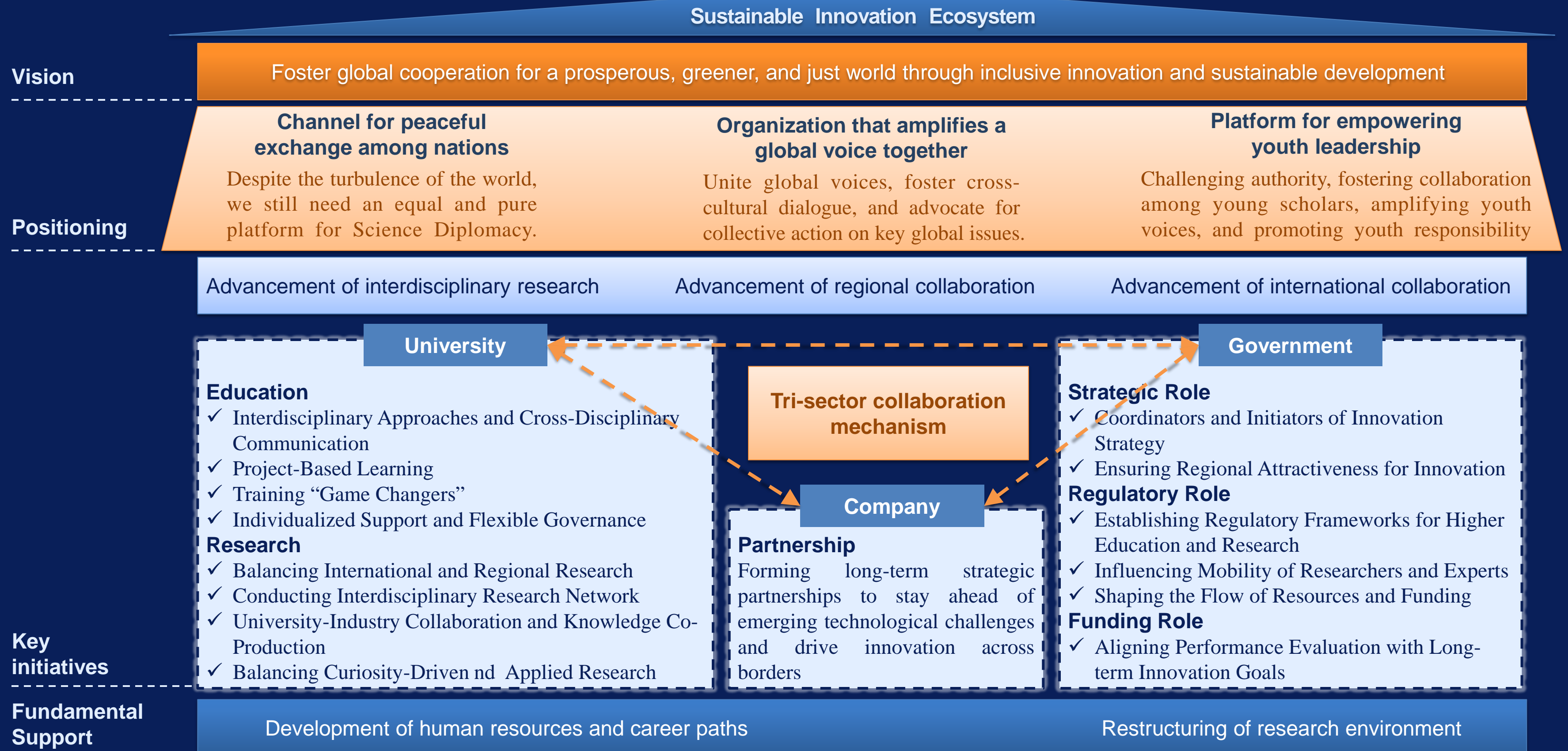
	Total	% GDP	Per researcher (10,000 yen)	Corporate	%	University	%	Public sector	%
China	717,177	2.65%	991	557,327	77.70%	59,195	8.30%	82,910	11.60%
Japan	220,497	3.70%	2,430	161,199	73.10%	39,365	17.90%	19,932	9.00%

In 2023, China's funding distribution was as follows:6.77% for basic research, 11.0% for applied research, and 82.2% for experimental development

DATA SOURCE: (1) https://www.keguanjp.com/kgjp_zhengc/kgjp_zhengc/pt20241226000013.html#:~:text=日本总务省统计局的调查显示,2023年度（2023年4月~2024年3月）日本的科学技术研究经费总额较上一年度增长6.5%25,达到220%2C497亿日元最高值%E3%80%82,这是日本科研经费的连续三年增长,占国内生产总值（GDP）的比例也达到了3.70%25,较上一年度上升0.05个百分点%E3%80%82%20平均每位研究人员的经费金额同比增长6.9%25,达到2430万日元,同样实现了连续三年的增长%E3%80%82;
(2)https://www.stats.gov.cn/sj/zxfb/202410/t20241002_1956810.html



What should we do



What we need



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Thanks for your time and attention

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