



# THAILAND FUTURE FOOD FOR SUSTAINABILITY

3 December 2024

Ballroom 1 (2<sup>nd</sup> floor)  
Sheraton Grande Sukhumvit Bangkok





# THAILAND FUTURE FOOD FOR SUSTAINABILITY



## Session 3:

# Building an Ecosystem for Future Food Research and Translation in Thailand

*Ms. Warisara Phungtonglor  
Director, Investment Promotion Division 1  
Thailand Board of Investment*

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## Session 3:

# Building an Ecosystem for Future Food Research and Translation in Thailand

*Mr. Lertchai Lertvut  
Deputy Secretary - General  
Food and Drug Administration*

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*Chaiyatorn Limapornvanich, Ph.D.  
Director of Innovation Strategy  
National Innovation Agency*

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*Asst. Prof. Akkharawit Kanjana-Opas, Ph.D.  
Program Management Unit for Competitiveness (PMUC)*

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**Moderator**  
*Asst. Prof. Akkharawit Kanjana-Opas, Ph.D.*

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# THAILAND FUTURE FOOD FOR SUSTAINABILITY



## Session 3:

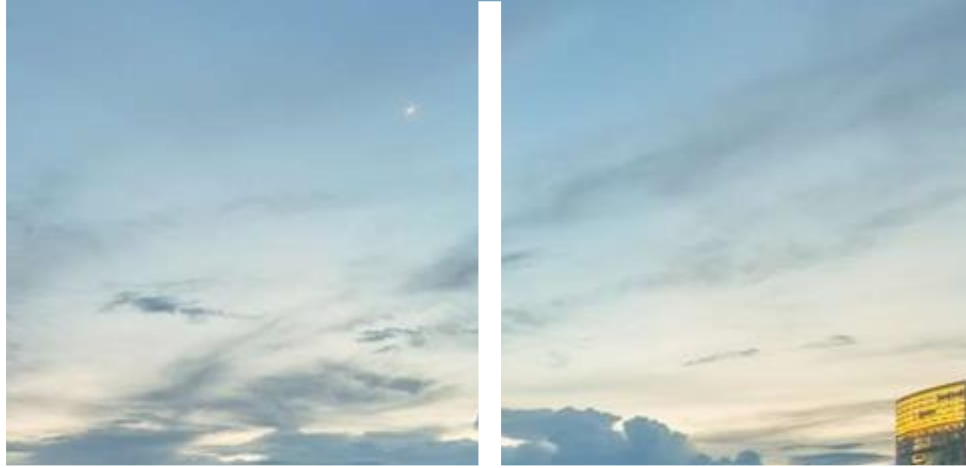
# Building an Ecosystem for Future Food Research and Translation in Thailand

*Ms. Warisara Phungtonglor  
Director, Investment Promotion Division 1  
Thailand Board of Investment*

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# Thailand Investment Promotion Policy

: NEW Economy, New Opportunities



***Miss Warisara Phungtonglor***  
*Executive Director*  
*Investment Promotion Division 1*

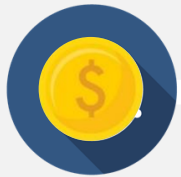
3<sup>rd</sup> December 2024



# BOI's Role: To Drive the Investment to the New Economy

## About BOI

**BOI** is a government agency under the Office of the Prime Minister



### Promoter

drives and promotes investment in private sector in alignment with the country's development strategy & the changing world context



### Integrator

integrates Government support tools such as tax, finance, and non-tax incentives in a whole package



### Facilitator

coordinates with agencies to develop the ecosystem & facilitate ease of investment & eliminates problems/obstacles



### Connector

links large-scale with small-scale enterprises, Thais with foreigners, across industries & locations to expand business opportunities

## Overseas Offices

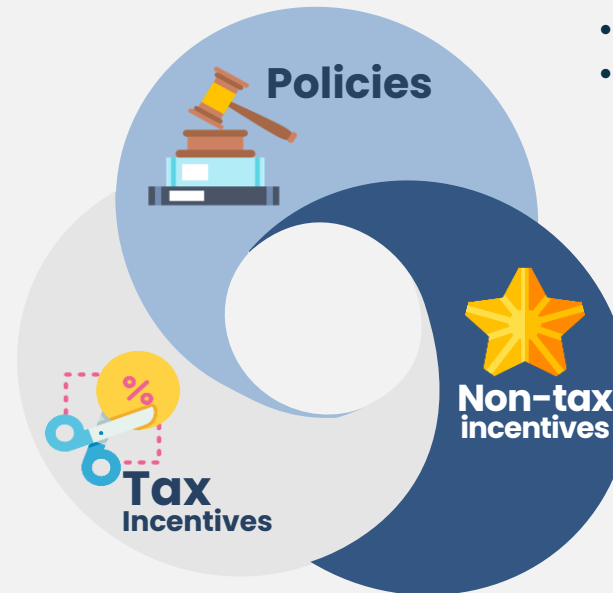




# BOI's Role: To Drive the Investment to the New Economy

## BOI's Investment Promotion Measures

- Corporate income tax exemption **up to 13 years**
- 50% Corporate income tax reduction for **5 years**
- Exemption of import duties on machinery
- Exemption of import duties on raw or essential materials imported for exports
- Exemption of import duties on goods imported for R&D
- **Double** deduction for the cost of transportation, electricity and water
- **25%** deduction for the cost of installation or construction of facilities



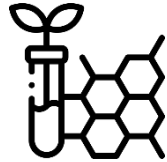
- Land ownership
- Work permit & visa facilitation
- 100% foreign ownership
- **No** local content requirements
- **No** export requirements
- **No** restrictions on foreign currencies



# 10 Sections of Activities Eligible for Promotion

## Section 1

Agricultural, Food and  
Biotechnology Industries



## Section 2

Medical Industry



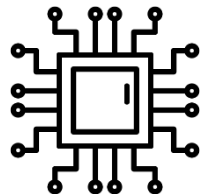
## Section 3

Machinery and  
Vehicles Industry



## Section 4

Electrical Appliances  
and Electronics industry



## Section 5

Metal and  
Material Industry



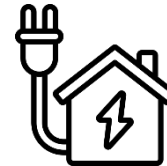
## Section 6

Chemical and  
Petrochemical Industry



## Section 7

Public Utilities



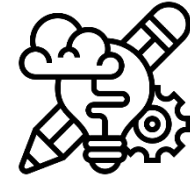
## Section 8

Digital Industry



## Section 9

Creative Industry



## Section 10

High Value Service



**400 +**  
Eligible activities



# Investment Promotion Criteria



Must be classified under list of Activities Eligible for Investment Promotion



New Machinery must be used.



The minimum capital investment requirement of each project is 1 million baht (excluding cost of land and working capital)



Registered as a Company, Foundation or Cooperative



The debt-to-equity ratio must not exceed 3 to 1



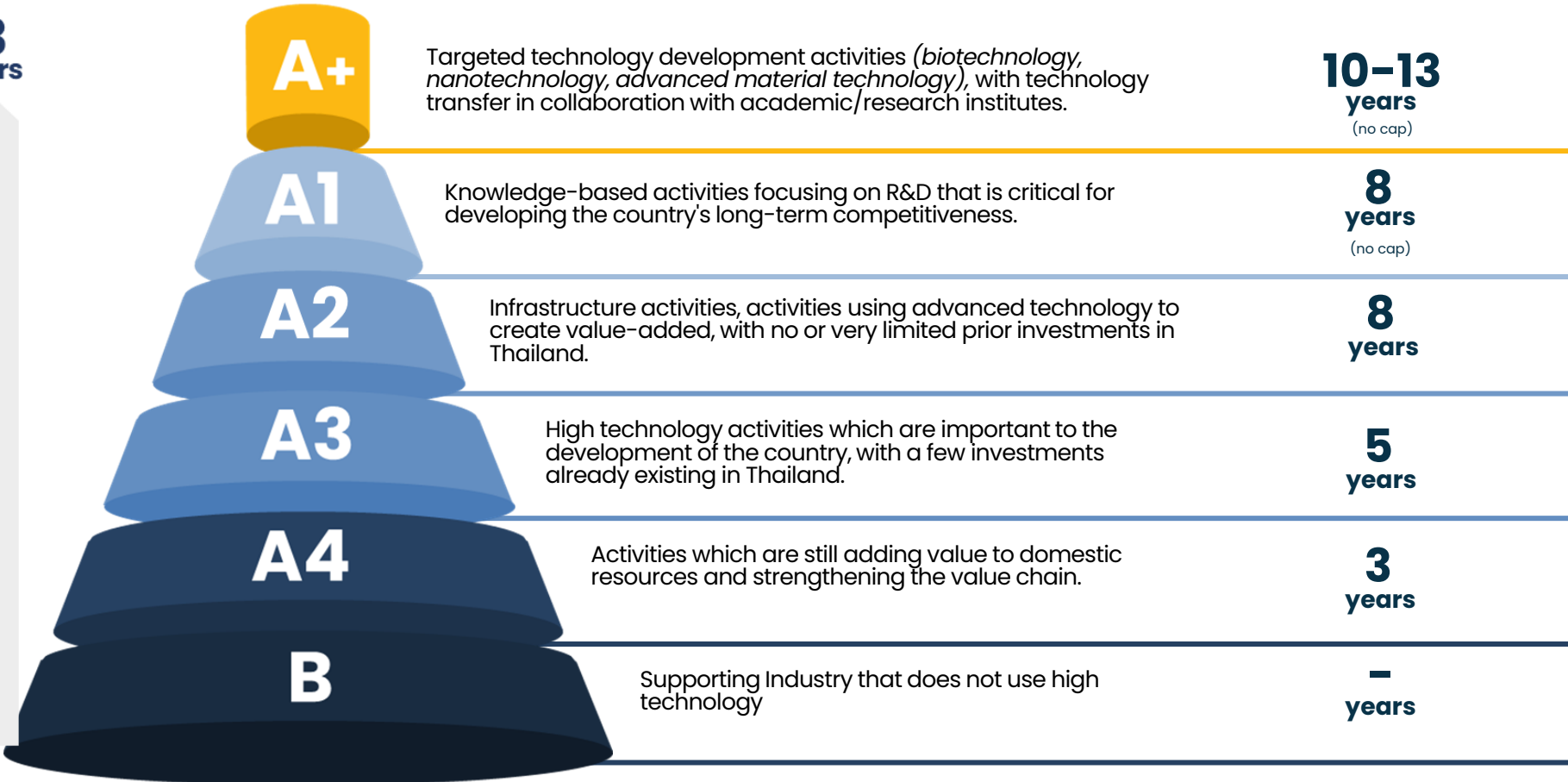
# Investment Promotion measures for Targeted Industries

## Classification of Incentives

13 years

CIT exemption

0 year



- Exemption Import duties on machinery
- Exemption Import duties on raw materials
- Non-tax incentives

Incentives are based on several key factors including level of technology, role in supply chain, and location.

# Promoted activities in **Food Industry**

Activities	Group	CIT Exemption	Exemption of import duties on machinery	Exemption of import duties on raw materials used in production for export	Non-tax incentives
<b><u>FOOD PROCESSING</u></b>					
Manufacture or preservation of food, beverages, food additives, food ingredients or dietary supplement products using modern technology	<b>A3</b>	5 years	✓	✓	✓
<b><u>FUTURE FOOD</u></b>					
Manufacture of food with health claims	<b>A2</b>	8 years	✓	✓	✓
Manufacture of novel food	<b>A2</b>	8 years	✓	✓	✓
Manufacture of organic food	<b>A2</b>	8 years	✓	✓	✓
Manufacture of medical food	<b>A2</b>	8 years	✓	✓	✓
<b><u>BIOTECHNOLOGY</u></b>					
Manufacture of bio-molecules and bioactive substances using microorganism, plant cells and animal cells	<b>A1</b>	8 years No CAP	✓	✓	✓



# Promoted activities in **Food Industry**

Activities	Group	CIT Exemption	Exemption of import duties on machinery	Exemption of import duties on raw materials used in production for export	Non-tax incentives
<b><u>Processed agricultura</u></b>					
Manufacture of starch made from plants	<b>A2-A4</b>	8-3 years	✓	✓	✓
Manufacture of oil or fat from plants or Animals	<b>A3</b>	5 years	✓	✓	✓
Manufacture of sugar	<b>A4</b>	3 years	✓	✓	✓

# BOI Investment Incentive Scheme

## Basic Incentives

≤13 years CIT exemption

### Activity-Based

- Agriculture, Food & Biotechnology
- Medical
- Machinery and Vehicles
- Electrical and Electronics
- Metal and Materials
- Chemicals and Petrochemicals
- Public Utilities
- Digital Industries
- Creative Industries
- High-Value Services



## Additional Incentives

### Competitiveness Enhancement

- Research & Development (R&D)
- Support academic/ research institutes, or technology and human resource development fund
- IP licensing fee
- Advanced technology training
- Development of local suppliers
- Product and packaging design

### Area-Based

- EEC 3 provinces
- SEZ 10 provinces
- 4 Special Economic Corridors
- Southern border provinces
- 20 provinces with lowest income
- Industrial Estates/Zones
- Science and Technology Parks (TSP, Food Innopolis, Space Krenovation Park)
- Yothee Medical Innovation District

### Agenda-based

- Investment Stimulation Measure for Economic Recovery
- Smart and Sustainable Industry Measure
- Social and Communal Development Measure
- Comprehensive Relocation Measure
- Retention and Expansion Measure
- Measure to Support the Establishment of Highly-skilled Professional Development Institutes



# Measures for Competitiveness Enhancement

## 1. Provide extra incentives to encourage the implementation of competitiveness-enhancing initiatives

**Eligible Investment/Expenditures for the computation**

- Technology and Innovation**
  - Research and Development (R&D)
  - Licensing fees for using domestically developed technology
  - Product and package design
  - Support for S&T organizations such as academic institutions, specialized training centers, research institutes, and public agencies, including various funding such as technology and innovation, personnel development as approved by the BOI
- Human Resource Development**
  - Advanced technology training
  - Organizing training or accepting student internships for work training and skill development during their S&T education
- Development of Business Operators' Potentials**
  - Local supplier development

**Investments/  
Expenditures to Sales  
in the first 3 years**

**Additional Periods  
for CIT Exemption**

+ **Additional Incentives** **NEW**



+ **Additional CIT Exemption Limit** **200%** of Investments/Expenditures

**In the case of investments/  
Expenditures on R&D ≥ 1%**

**CIT Exemption  
with no Cap**

**Extension of CIT Exemption to  
a Maximum Period of 13 years**

## 2. Promote establishment of Institutes for advanced skill personnel development

Promote private enterprises to establish academic/training institutes for advanced technology by providing incentives to their parent company



Note: Board of Investment Announcement No. 8/2565 and No. 9/2565

Map of Thailand

# Area-based Promotion Measures

- **The Eastern Special Development Zone (Eastern Economic Corridor : EEC)** covering 3 provinces
- **Special Economic Corridors in 4 Regions (NEC, NeEC, CWEC, SEC)** covering 16 provinces
- ★ **Special Economic Zones (SEZ)** covering 10 provinces
- **Areas with low per capita incomes including 20 provinces**
- **Southern Border Area** including 4 provinces and 4 districts of Songkhla
- ▲ **Model City Project in the Southern Board Provinces** (Nong Chik, Pattani/ Betong, Yala/ Jana, Songkhla/ Su-ngai Kolok, Narathiwat)
- 🧪 **Science and Technology Parks**
  - **Science Parks** (at Pathumthani, Chiangmai, Khonkaen, and Songkhla)
  - **Food Innopolis** (13 sites across the country)
  - **Space Krenovation Park** by GISTDA
  - **Innovation Platform** at EECi
  - **Thailand Institute of Scientific and Technological Research (TISTR)**
  - **Asian Institute of Technology (AIT)**
  - **Yothi Medical Innovation District** by NIA



# Targeted Areas : 20 Provinces with lowest per capita income

Kalasin, Chaiyaphum, Nakhon Phanom, Nan, Bueng Kan, Buri Ram, Phrae, Maha Sarakham, Mukdahan, Mae Hong Son, Yasothon, Roi Et, Si Sa Ket, Sakhon Nakhon, Sa Kaew, Sukhothai, Surin, Nong Bua Lamphu, Ubon Ratchatani and Amnatcharoen)

		Exemption CIT	+ Additional Exemption CIT	+ 50% tax reduction for 5 years	Total	Deduction of expenses
13 years	A1+	10 Years	+ 3 Years	-	13 Years	✓
	A1	8 Years	-	✓	8 Years	✓
	A2	8 Years CAP	-	✓	8 Years CAP	✓
	A3	5 Years CAP	+ 3 Years	-	8 Years CAP	✓
	A4	3 Years CAP	+ 3 Years	-	6 Years CAP	✓
	B	-	+ 3 Years	-	3 Years CAP	✓
	0 year					

\*No maximum exemptible CIT \*\* Depends on Activities

Source: Thailand Board of Investment

# Agenda-based : Smart & Sustainable Industrial Upgrade Programs

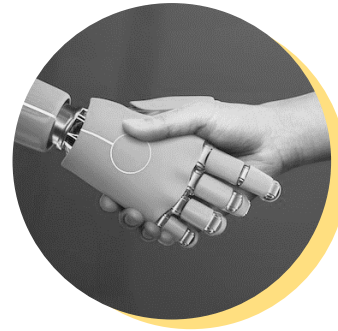
## Smart



**Automation and Robotics**



**Digital Technology**



**Industry 4.0**

## Sustainable



**Energy Conservation, Alternative Energy, Environmental Impact Reduction**



**International Standards of Sustainability such as GAP, FSC, PEFCs, ISO 22000**

**Efficiency Improvement for Existing Projects**

**3** years  
**Exemption CIT** **50%\* or 100%**  
*\*depending on the conditions*  
**of the investment value in efficiency enhancement.**

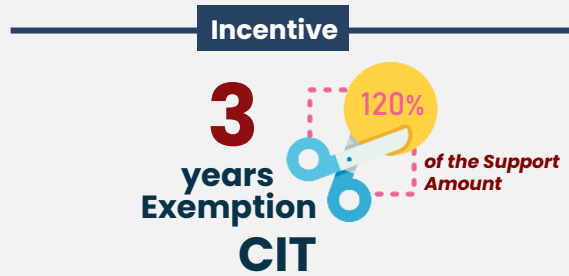
**New Investment of Group B with upgraded Operations**

**3** years  
**Exemption CIT** **50%\* or 100%**  
*\*depending on the conditions*  
**of the investment in automation and robotics systems or Industry 4.0 manufacturing standards.**

# Agenda-based : Social and Local Development Investment Programs

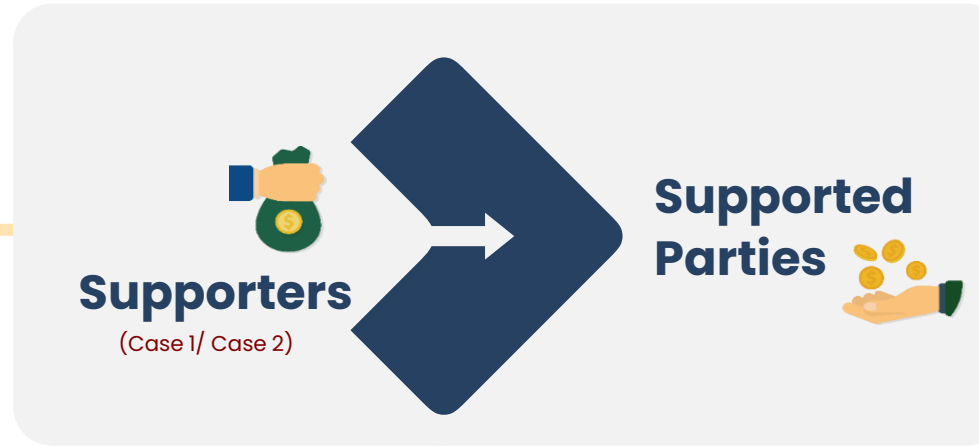
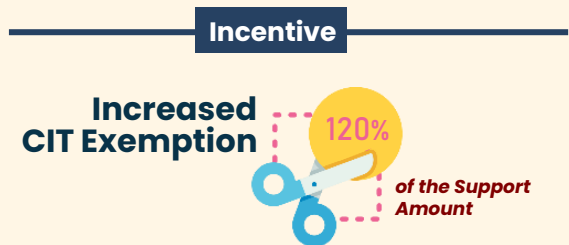
## Case 1: Non-BOI Promoted Projects

- Operating in the eligible activities for the promotion
- Having never been promoted or promoted, but with no CIT incentives; or the incentives have been expired



## Case 2: BOI Promoted Projects

- CIT incentives have not been expired or a new project entitled for CIT exemption



### Supported Parties

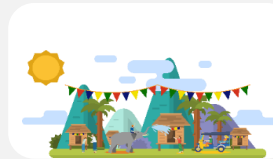
- Co-operatives
- Community Enterprises
- Social Enterprises
- Local Administrative Organizations
- Government Agencies



Agriculture and Water Systems



Local Products/OTOP



Local Tourism



Education, Public Health, and Environment

### TOTAL PROJECT INVESTMENT

**≥5 Million Baht and  
>500,000 Baht  
per supported party**

#### Types of Support Expenses

- Cost of Machinery and Equipment
- Cost of Plant Construction
- Cost of Training
- Other Expenses Approved by BOI

**Projects must be completed *within 3 years* from the date of investment promotion certificate issuance or of application for project amendments, and must not exceed the CIT exemption period.**



# Investment Promotion Measures for **SMEs**

## Criteria:

1. Thai nationals must hold shares totaling not less than 51% of the registered capital.
2. Total revenue of entity whether BOI- or non-BOI-promoted projects do not exceed 500 million baht in the first 3 years of operation.



## Condition:

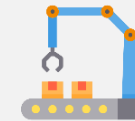
- The projects must have investment capital of at least 0.5 million baht excluding the cost of land and working capital.
- The debt-to-equity ratio must not exceed 4 to 1.
- Domestic used machinery is allowed, not exceeding 10 million baht. However, new main machinery must be invested not less than 50% of the total value of the machinery in the project.

## Incentives:



**3 – 8 years  
CIT exemption**

**200% CAP**



**Exemption Import duties  
on machinery**

**Exemption  
Import duties  
on raw materials**



**Non-tax incentives**

There are countless  
**Reasons to**  
**INVEST** In Thailand

**Thank you**

**Thailand (Head Office)**

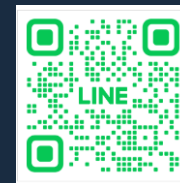
Website : [www.boi.go.th](http://www.boi.go.th)

Tel. : +66 2553 8111

Email : [head@boi.go.th](mailto:head@boi.go.th)

CSU : [booking.boi.go.th](http://booking.boi.go.th)

Line official :





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Deputy Secretary - General  
Food and Drug Administration*

Brought to you by:





**Triple-A Policy Dialogue**



**Approve Anywhere  
Anytime**



เกษัชกรเลิศชาย เลิศวุฒิ  
รองเลขาธิการคณะกรรมการอาหารและยา

# Triple-A Policy Impact Ignite Thailand:



E-organization

**FDA ESPRESSO ABCD**

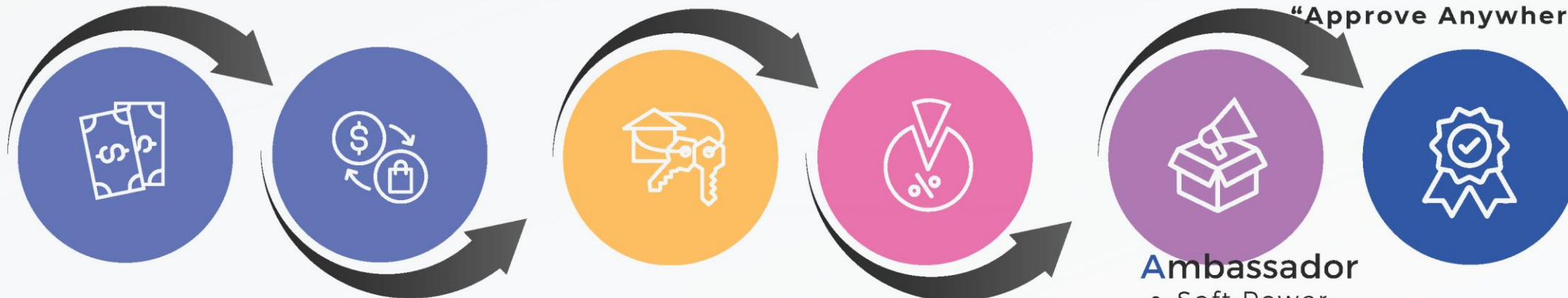
Speed&Safety

Opportunities

Opportunities

สร้างโอกาสทางเศรษฐกิจรวมทั้งช่วยเพิ่มมูลค่าทางเศรษฐกิจของ Care and Wellness Economy และบริการทางการแพทย์ จากนโยบาย Medical Hub

- อำนวยความสะดวกจากนโยบายของอย. **Triple - A** เพิ่มโอกาสทางธุรกิจ จาก **“Approve Anywhere Anytime”**



## Business Matching

- Oryor Quality Award
- SMEs and Otop
- Health Product Champion
- Health Tech and Medical Device Start Up

## Cocreation&Consultation

- ส่งเสริมการผลิตในประเทศ
- R&D Medical Device and AI
- R&D Future Foods
- R&D ATMP/ Biologics & Vaccine
- Medical Plants/ API
- วิสาหกิจชุมชน/ โครงการหลวง

## Development

- Human Development
- Digital Development
- Infrastructure Development เพื่อส่งเสริมด้าน Digital Hub

## Ambassador

- Soft Power
- Thailand Health Product Champion
- High Potential Food Product Entrepreneur
- High Potential Health Tech
- Medical Startup



งบประมาณรวมทั้งสิ้น  
49,486,780 บาท

1. งบประมาณภายใต้โครงการ  
ผลิตภัณฑ์สุขภาพปลอดภัย คนไทย  
ห่างไกลโรค 24,072,600 บาท

2. งบประมาณภายใต้โครงการยกระดับระบบกำกับดูแล  
ผลิตภัณฑ์สุขภาพให้ได้มาตรฐานสากล 1,500,000 บาท  
3. งบประมาณภายใต้โครงการสร้างมูลค่าผลิตภัณฑ์  
สุขภาพนวัตกรรมไทย 3,650,000 บาท

4. งบประมาณรายจ่ายประจำ 20,264,180 บาท

ผู้บริโภคปลอดภัย  
อาหารปลอดภัย คนไทยห่างไกลโรค

ผู้ประกอบการพัฒนาไกล  
FDA Care+ / Helper / Co-Creator

ระบบคุ้มครองสุขภาพไทยยั่งยืน

อาหารปลอดภัย



(ไอโอดีน,  
ผักผลไม้ปลอดภัย)

พัฒนาและส่งเสริม  
ทางเลือกสุขภาพ



Healthier Choice

ขับเคลื่อนอาหารอนาคตเพื่อเศรษฐกิจ

FUTURE  
FOOD

Alternative Protein(แมลง)/  
Cell-Based Food(สถานที่ผลิต)/  
Food with Functional Claims (FFC)/  
Positive list Probiotic สายพันธุ์ไทย)

พัฒนาเครือข่าย



(หน่วยตรวจสอบและ  
รับรอง, หน่วยฝึกอบรม  
ผู้ควบคุมการผลิตอาหาร)

พัฒนาผู้ตรวจประเมิน  
ระบบจัดการ  
ความปลอดภัยอาหาร  
ระดับอาเซียน



IT

Post Audit

Rapid Food Alert System

e-License ใบอนุญาต/ต่ออายุอัตโนมัติ

ชำระค่าธรรมเนียมแทนการยื่นคำขอต่ออายุ (กพร.)

Auto-E-Permission อาหารเสี่ยงต่ำ 49 ประเภท

ระบบกำกับ ติดตาม รายงานผลการดำเนินงาน  
ตามแผนปฏิบัติการด้านการจัดการด้านอาหาร  
ของประเทศไทย พ.ศ. 2566-2570

ร่าง พรบ.อาหาร พ.ศ. ... เตรียมกฎหมายลำดับรอง / **ปรับปรุง ปสร.** อำนวยความสะดวกทางการค้า

04

ขับเคลื่อนแผนปฏิบัติการด้านการจัดการอาหารของประเทศไทยผ่าน คกอช./  
สำรวจความเชื่อมั่นของผู้บริโภคต่อคุณภาพและความปลอดภัยของอาหาร

*Thank  
you*





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*Chaiyatorn Limapornvanich, Ph.D.  
Director of Innovation Strategy  
National Innovation Agency*

Brought to you by:







**NIA**  
สำนักงานนวัตกรรมแห่งชาติ

# 15<sup>TH</sup> ANNIVERSARY

## NATIONAL INNOVATION AGENCY (PUBLIC ORGANIZATION)

National Innovation Agency (Public Organization) or NIA, under the Ministry of Higher Education, Science, Research and Innovation was entrusted by Thai Government to act as a core agency to promote and facilitate creation, management, and exploitation of innovation in Thailand.

### VISION

**KEY AGENCY IN ENHANCING  
NATIONAL INNOVATION SYSTEM  
TOWARDS SUSTAINABLE VALUES**

### MISSION

- TO STRENGTHEN THAILAND'S NATIONAL INNOVATION SYSTEM
- TO CREATE OPPORTUNITIES AND INCREASE ACCESS TO INNOVATION INFRASTRUCTURE
- TO UPGRADE SKILLS AND INNOVATION CAPABILITIES

# FOCAL CONDUCTOR

"ผู้กำหนดทิศทาง  
นวัตกรรม"





**NIA**  
สำนักงานนวัตกรรมแห่งชาติ

GROOM · GRANT · GROWTH · GLOBAL

**15<sup>TH</sup>** ANNIVERSARY  
NATIONAL INNOVATION AGENCY  
(PUBLIC ORGANIZATION)

## GROOM

- ร่วมมือกับภาคเอกชนเพื่อขยายกลุ่ม IBE เป้าหมายให้มากขึ้น
- พลักดันพรบ. สตาร์ทอัพ



## GRANT

- Venture Capital (VC) :  
Direct investment,  
Fund of Fund
- Impact Investment



## GROWTH

- NIA Accelerator
- Market Expansion



## GLOBAL

- Landing Program
- Global Collaboration



# INNOVATION THAILAND ALLIANCE

INNOVATIVE ORGANIZATION

DIGITAL TRANSFORMATION





**NIA**  
สำนักงานนวัตกรรมแห่งชาติ

GROOM · GRANT · GROWTH · GLOBAL

**15<sup>TH</sup>** ANNIVERSARY  
NATIONAL INNOVATION AGENCY  
(PUBLIC ORGANIZATION)

# 7 NEW MECHANISMS

**REGIONAL MARKET VALIDATION**

Market Validation

**THEMATIC INNOVATION**  
NATIONAL INNOVATION AGENCY

Product Development

**MIND**

Consultancy Support

**STANDARD TESTING**

Standard Testing

**MARKET EXPANSION**

Market Expansion

**WORKING CAPITAL INTEREST**

Working Capital

**CORPORATE CO-FUNDING**

Collaborative Funding / Joint Venture

**GRANT**



**NIA**  
สำนักงานนวัตกรรมแห่งชาติ

GROOM · GRANT · GROWTH · GLOBAL

**15<sup>TH</sup>** ANNIVERSARY  
NATIONAL INNOVATION AGENCY  
(PUBLIC ORGANIZATION)

# ACCELERATOR PROGRAMS

**SPACE-F**  
FEEDING THE WORLD  
THROUGH INNOVATION

SPACE-F Incubator  
& Accelerator  
Program

**CLIMATE  
TECH**

Climate Tech  
Accelerator  
Program

**HEALTH  
TECH**

Health Tech  
Accelerator  
Program

**AGROWTH**  
AGTECH ACCELERATOR

Agrowth Agtech  
Accelerator  
Program

**GROWTH**





**NIA**  
สำนักงานนวัตกรรมแห่งชาติ

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(PUBLIC ORGANIZATION)

# STARTUP THAILAND

# GLOBAL STARTUP HUB SERVICE

## » INVESTMENT ANGEL INVESTOR NETWORK IN ACTION

Project to enhance stronger investor network, developing investment skill (QBAC+course) and have a stage for startup pitching together with networking activities in each region.



## » MARKET STARTUP THAILAND MARKETPLACE

The new market channels to build brand awareness and encourage access of startups' products and services to customers in both B2B and B2C through Startup Thailand platform.



## » CONSULTATION CONSULTATION SERVICE ( 1-1 ONLINE )

The 2 level of consultation service: Basic information of doing business in Thailand and In-depth clinic to develop the potential of startup both early and growth stage who need advice from expertise. For topic this year is legal, intellectual property, market access, market strategy or meet with VCs.



## » NETWORK DOMESTIC AND INTERNATIONAL NETWORKING EVENT

Domestic and international activities that connect startups, investors, and supporters from both public and private agencies to create opportunities for startups to meet and expand business together.



## » STARTUP VISA SMART VISA

Thailand National Innovation Agency (NIA) collaborate with The Board of Investment Thailand (BOI) to develop a special visa to attract startups entrepreneurs who wish to enter into the Kingdom of Thailand to work in "13 S-Curve industries" or the country's targeted industries.



**SMART VISA**  
**400+** HOLDERS  
**50+** SET UP COMPANY

MORE INFO



<https://smart-visa.boi.go.th/smart/>

**GLOBAL**



# AGRICULTURAL TRANSFORMATION



**1** AUTOMATED  
AGRICULTURE



**2** MONETIZATION  
OF AGRICULTURE



**3** DEMOCRATIZE  
MARKET



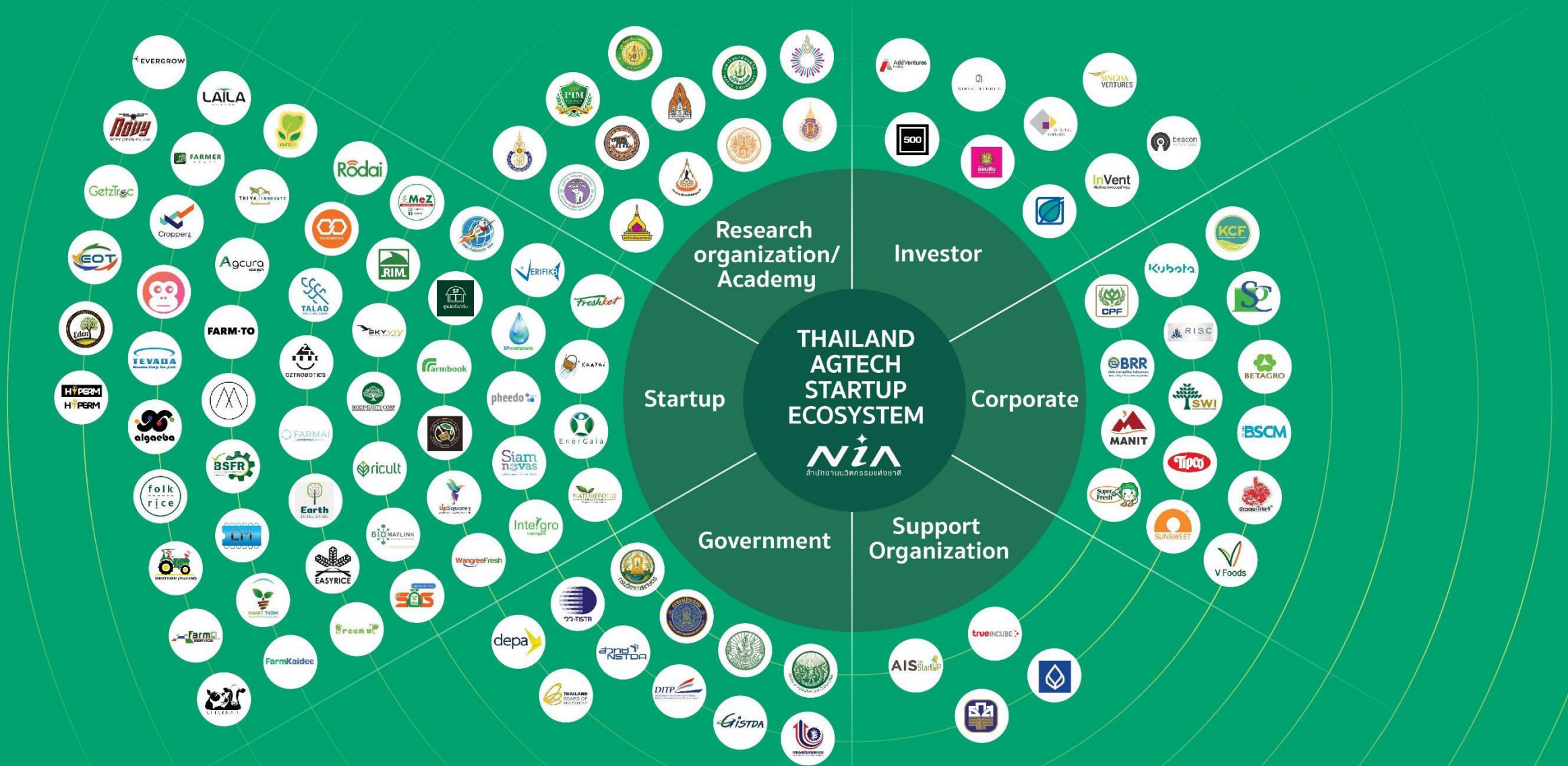
**4** LEAN  
AGRICULTURE



**5** AGTECH  
LEADER



# AgTech Startup Ecosystem







# Maejo Agriculture Innovation District Development & Implementation Plan



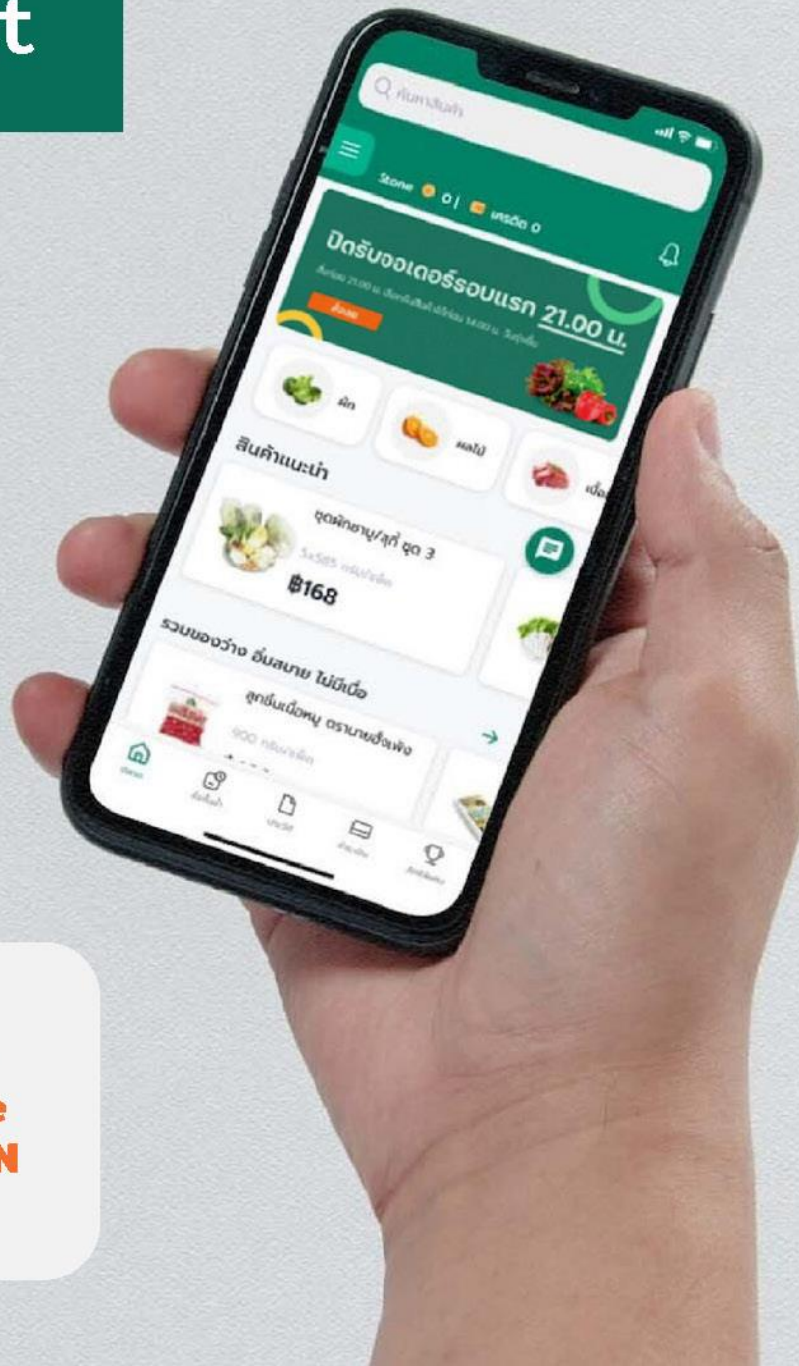


# Series B Investment



**freshket**

securing a US\$23.5 million Series B funding round led by **OR**, with participation from **Openspace Ventures, Betagro Holding, ORZON** and **Volta Circle**.



Freshket, a tech-enabled food supply chain platform, was founded in 2017 with an aim to provide consumers and food businesses with a wide variety of agricultural produce and the freshest ingredients, always sourced from local farmers and suppliers.



# Transformation in Future Food



**Climate  
Change**

**Resource  
Scarcity**

**Consumption  
Behavior**





# SPACE F

THE 1<sup>ST</sup> GLOBAL FOODTECH  
INCUBATOR AND ACCELERATOR PROGRAM  
OF THAILAND

## CO-FOUNDERS & PARTNERS



## 44 LOCAL AND INTERNATIONAL ALUMNI



### Key Metrics

<b>44</b>	<b>13</b>	<b>10</b>	<b>&gt; 35%</b>	<b>&gt; 70%</b>
Startups Supported	Countries of Origin	Countries where Products Sold	Success rate in getting funded	Got market testing opportunity / business collaboration from SPACE-F network
<b>94%</b>	<b>75%</b>	<b>67%</b>	<b>\$40M</b>	
Survival Rate	Presence in Thailand	Percentage to Win Awards	Funds Raised	





# Meet our community





















**5** Years

**80+** Startups

**17** Countries

**\$75M+** Funding

# Achievements

Startup	Description	POC / Co-R&D / Commercial Partnership	Global Accelerator / Soft-landing	Fundraising (Investment, Grant, etc.)
	<p>A nutritionally dense, plant-based protein flour, bread, and pasta</p>	  		 
	<p>Cowless milk with precision fermentation technology</p>		 	 
	<p>Egg Alternative from Rice Bran Protein</p>		 	 





The Leaf Protein Co.

► Treatment and extraction of leaf protein from cabbage and spinach to produce functional protein ingredients.



Pet products with seaweed



► Incorporation of Seadling product "PhycoBio" into chicken-based pet treat through outside coating and direct mixing.

Development of plant-based tuna spread by combining Lypid's fat encapsulation solution with Thai Union's plant-based tuna products





# THAILAND FUTURE FOOD FOR SUSTAINABILITY

3 December 2024

Ballroom 1 (2<sup>nd</sup> floor)  
Sheraton Grande Sukhumvit Bangkok





# THAILAND FUTURE FOOD FOR SUSTAINABILITY

## Session 3:

# Building an Ecosystem for Future Food Research and Translation in Thailand

*Asst. Prof. Akkharawit Kanjana-Opas, Ph.D.  
Program Management Unit for Competitiveness (PMUC)*

Brought to you by:





# Building an Ecosystem for Future Food Research and Translation in Thailand

Akkharawit Kanjana-Opas

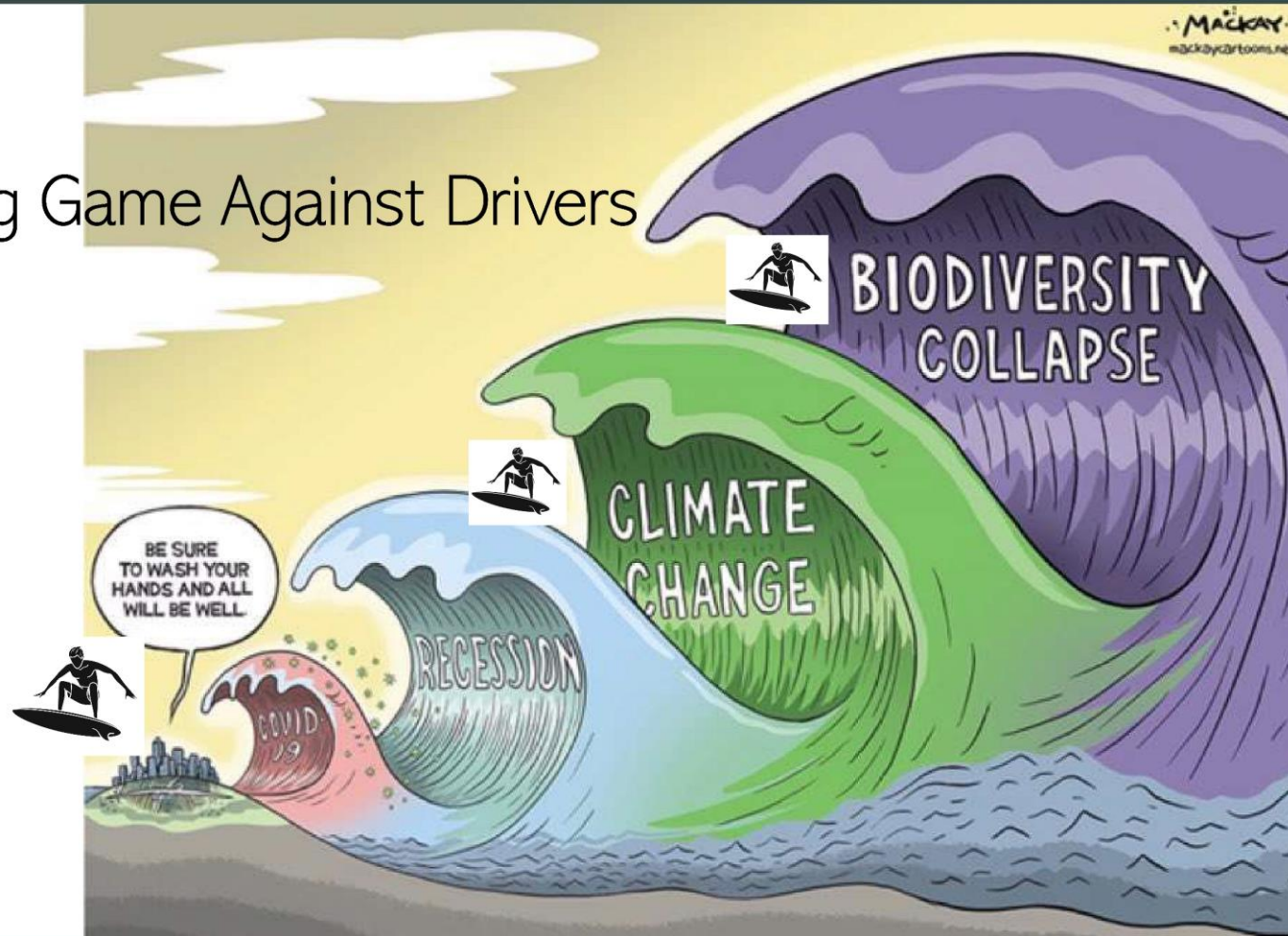
Program Management Unit for Competitiveness (PMUC)

Office of National Higher Education Science Research and Innovation Policy Council  
(NXPO)

akkharawit.kan@nxpo.or.th



# Racing Game Against Drivers



# Mega Trends

- **Demography**
  - Population in Africa will increase 109% by 2050 (20% in Asia, Latin America and North America, -4% in Europe)
- **Ageing society**
  - Slow economic growth, resource diverted to social & health spending
  - Change in lifestyle and consumption patterns
    - Products & services innovation
  - New technologies, e.g. Robotics, Neurosciences

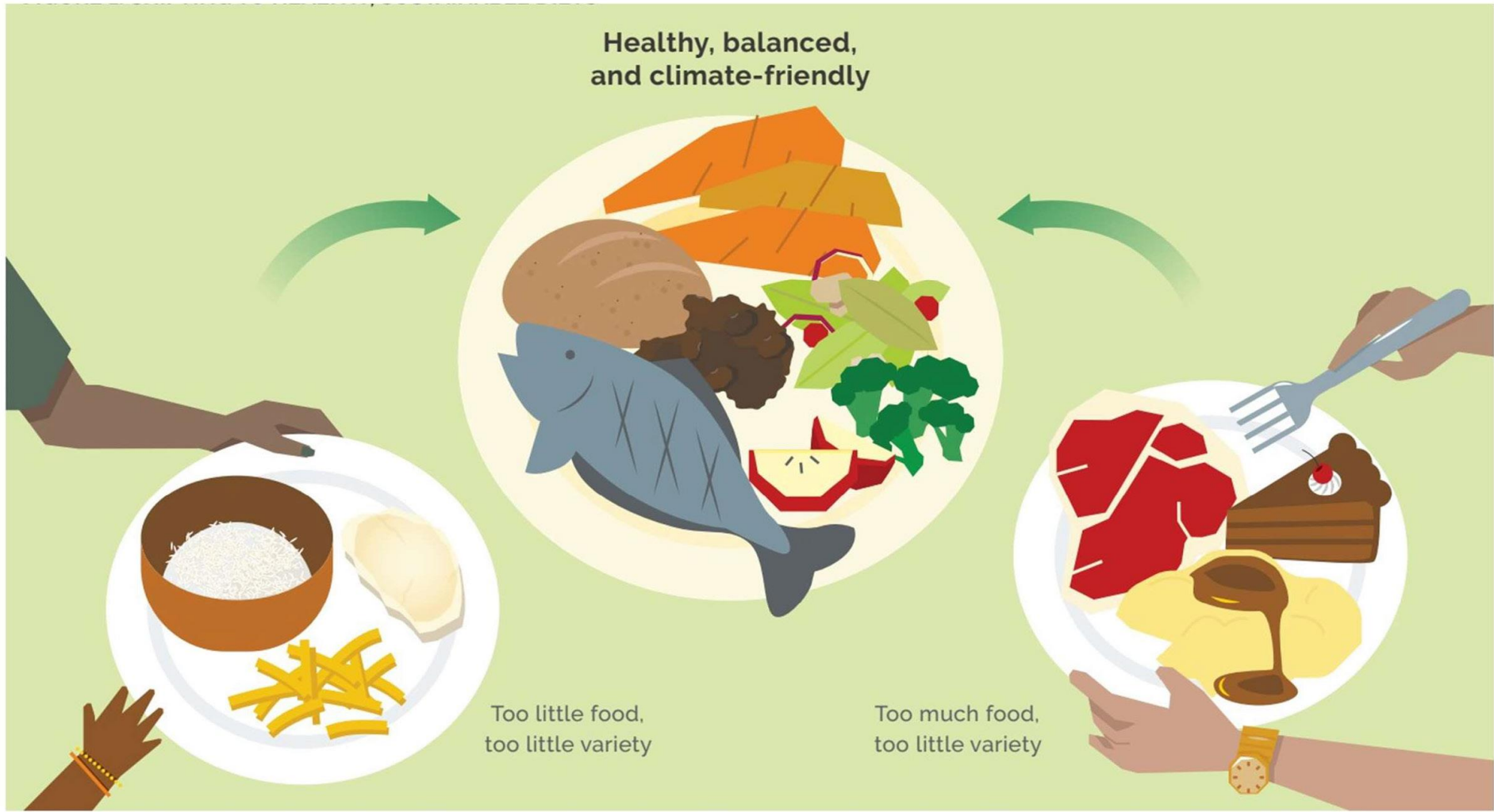






## **Mega Trends**

- **Food demand increase >60% to feed 9.7 billion people by 2050**
  - Innovation is the main driver of productivity growth
  - New technologies will play important role in agricultural & climate change
- **Sustainability**
- **New Sources of Protein**
  - Plant Based, Insect, Culturable Meat
  - Aquaculture (Fish and Seafoods) particularly in South and East Asia



Source: CGIAR Research Program on Climate Change, Agriculture and Food Security, 2019





## Future Trends

1. Sustainability
2. Technology
3. Personalization
4. Food Security
5. Consumer Experience
6. Health and Wellness
7. Global Influences



# Circular Economy Practices to Reduce Waste



## Food Waste Reduction

Implementation of practices to reduce food waste throughout the supply chain  
Repurposing of food waste into new products or energy generation



## Recycling and Composting

Increased emphasis on recycling and composting to minimize waste sent to landfills  
Innovative recycling technologies to transform food packaging and waste into valuable resources





# Regenerative Agriculture for Soil Health and Carbon Sequestration

## Soil Regeneration Techniques

Adoption of regenerative agricultural practices to improve soil health and fertility  
Use of cover crops, crop rotation, and reduced tillage to restore soil ecosystems

## Carbon Sequestration in Agriculture

Utilization of agricultural techniques to capture and store carbon in the soil  
Carbon farming methods such as agroforestry and conservation agriculture



# AI and Robotics in Food Production and Processing



## Automated Food Production

Use of robotics for planting, harvesting, and processing of crops  
Enhanced efficiency, productivity, and precision in agricultural operations



Photo credit: <https://coinmarketcap.com/community/articles/6562fe80ff277f3423ef1219/>



## AI-Enabled Quality Control and Food Safety

Implementation of artificial intelligence to monitor and control food quality and safety  
Detection of contaminants, spoilage, and quality defects in real-time



Photo credit: <https://www.jiva.ag/blog/how-artificial-intelligence-can-be-used-in-agriculture>





# Fusion Cuisines and Cross-Cultural Food Innovations



## Culinary Blending and Creativity

- Exploration of new flavors and combinations through fusion cuisines
- Integration of diverse culinary traditions and techniques



## Cultural Exchange and Food Tourism

- Growing interest in cultural experiences through food
- Food tourism to explore diverse cuisines and culinary traditions



## Adapting Traditional Foods for Modern Diets and Preferences

### Modernization of Traditional Recipes

- Modification of traditional dishes to align with modern dietary preferences
- Development of healthier and more sustainable versions of traditional foods

### Preservation of Culinary Heritage

- Efforts to preserve traditional food cultures and culinary techniques
- Recognition of cultural food practices as intangible heritage



# From Global to Thailand

---

01

Culinary Heritage and Innovation

02

Leveraging Agricultural Strengths

03

Exploring Alternative Proteins

04

Enhancing Food Processing and Technology

05

Capitalizing on Wellness and Functional Foods

06

Sustainable Tourism and Gastronomy

07

Positioning Thailand as a Regional Food Hub

08

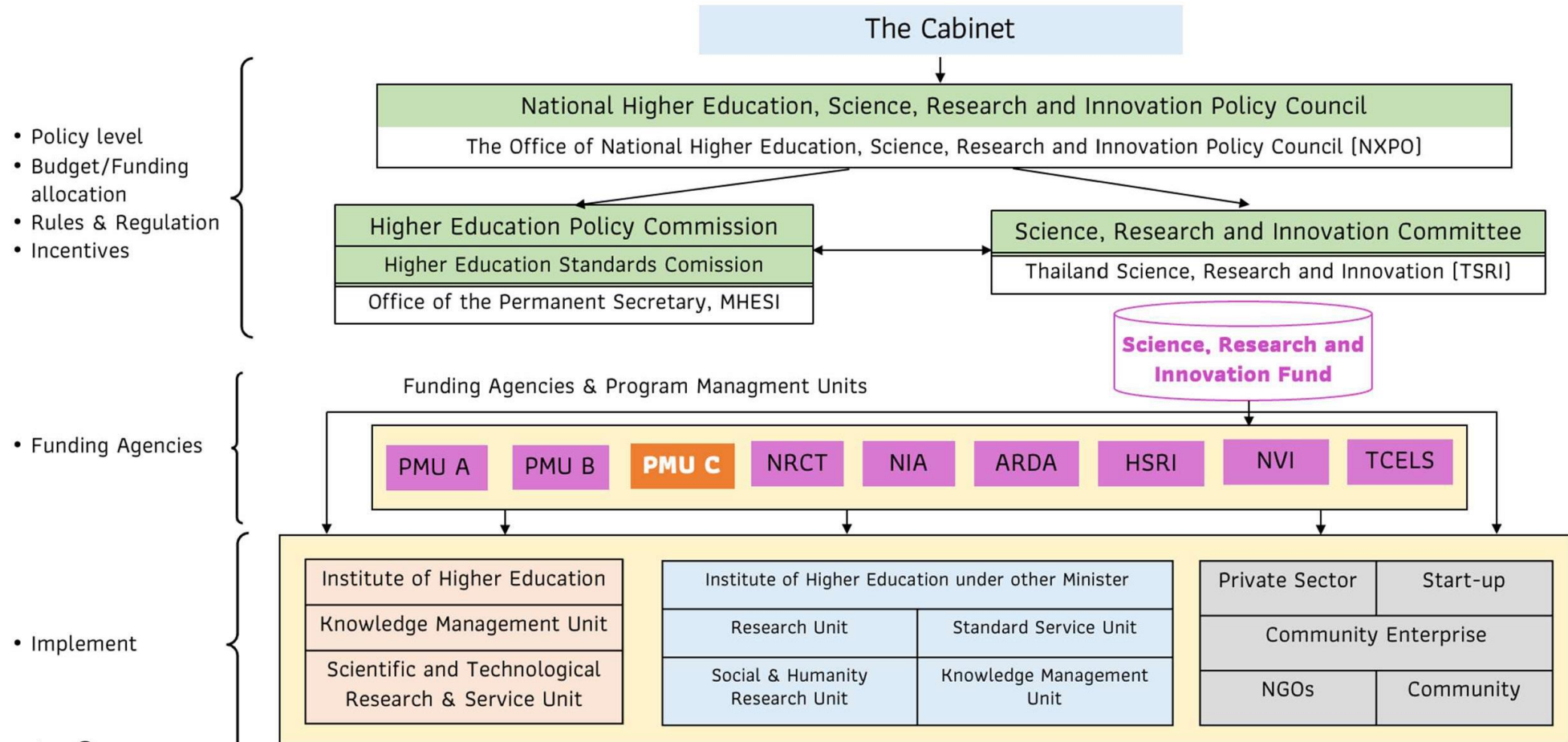
Establishing Supportive Regulatory Environment



## Program Management Unit for Competitiveness: PMUC

PMUC has a mission to administer research fund to enhance the nation's competitiveness by fostering collaboration between the public and private sectors in Thailand and from abroad and advancing research outputs to market.





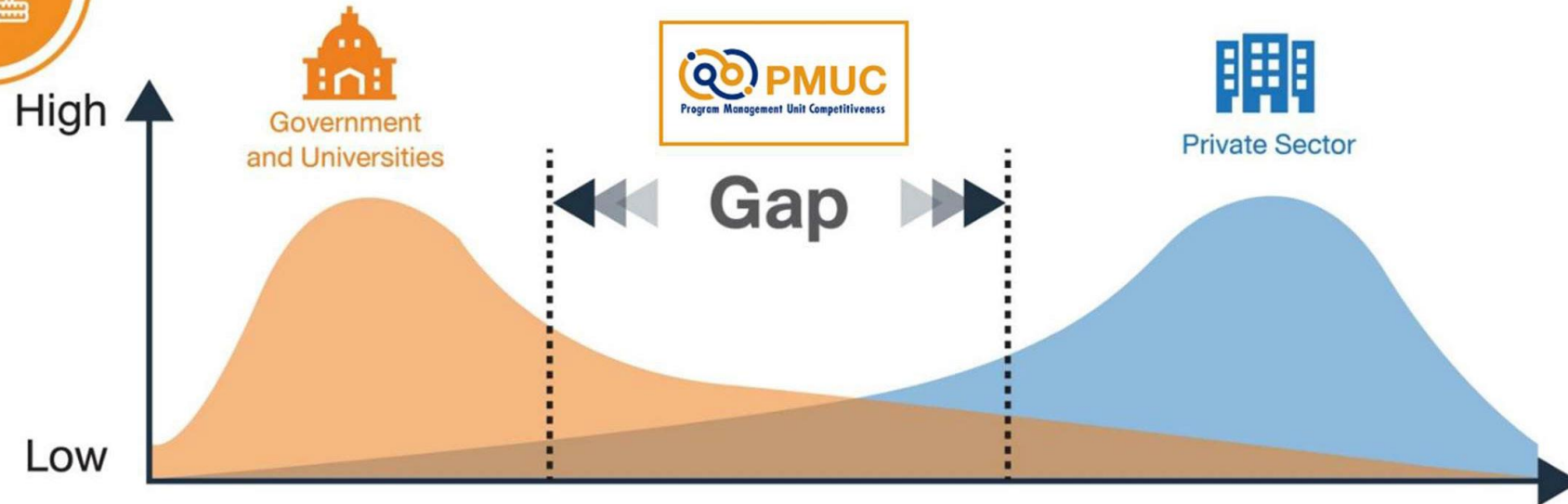
- Policy level
- Budget/Funding allocation
- Rules & Regulation
- Incentives

- Funding Agencies

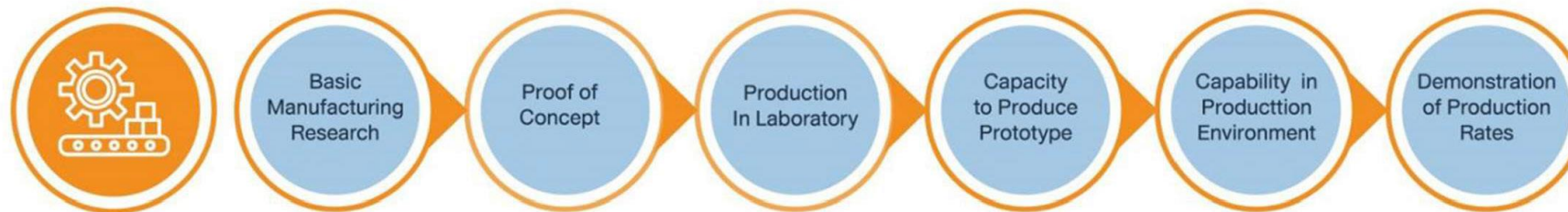
- Implement



## FUNDING / INVESTMENT



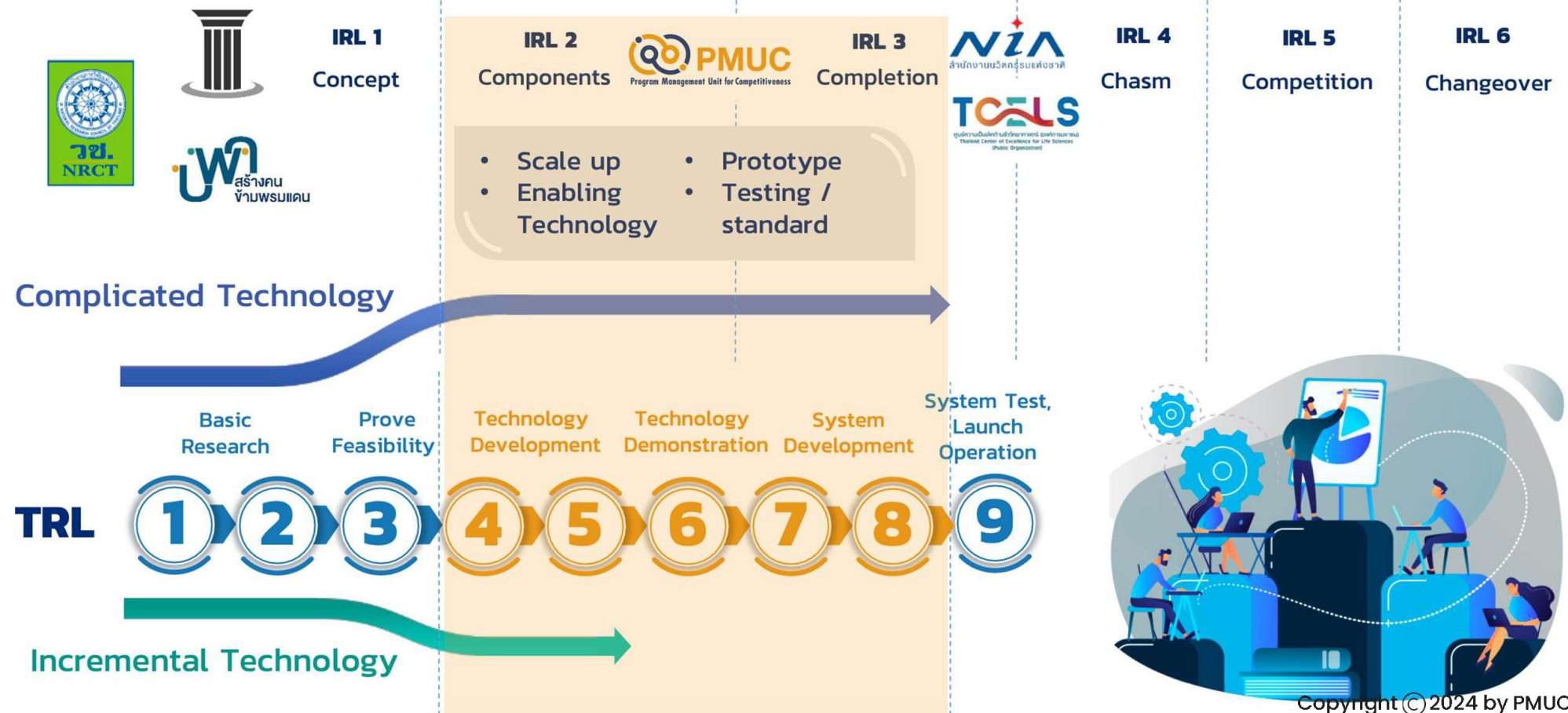
## MANUFACTURING-INNOVATION PROCESS





### Technological Development

### Market Evolution



# Program Management Unit for Competitiveness (PMU C)



## Focused Industrial Sectors

- 01 Functional ingredient, High Valued Agricultural Products & Health Foods
- 02 Health & Medicine
- 03 Bioenergy, Biochemical & Biomaterials
- 04 Tourism & Creative Economy
- 05 Digital Platform
- 06 Circular Economy of Thailand
- 07 Future Mobility, Robotics & Automation
- 08 Logistics

## Industrial Enabling Programmes

- 01 Deep tech accelerators
- 02 National Quality Infrastructure
- 03 IDEs
- 04 Global Partnership





## **Functional Ingredients and High Valued Agricultural Products and Health Foods**

**PMU-C aims to develop knowledge and innovation to create value to agricultural and food products.**

The Agriculture and Food Program supports the development of novel products and processes for the agriculture and food industry and the advancement of technologies from laboratory to industry with the goal to introduce innovative products to both domestic and international markets.

The scope includes the development of functional ingredients, natural extracts, healthy food products, cold chain systems, and machineries for the agriculture and food industry. Capacity building of business operators, researchers and technologists as well as the development of dynamic innovation ecosystem are also emphasized to enable an innovation-driven economy.



### **Examples of research topics**

- Production of health and functional food products meeting the market demand by employing advanced technologies
- Development of biological processes for the production of food ingredients and natural products, upcycling of agricultural and agro-industrial wastes, and circular agricultural and food production
- Development of equipment and machines to support farmers and food processing SMEs

### **Highlights**

- Development of high-value products from porcine placenta functional ingredients
- Evaluation of consumption safety and effects of functional drink containing tuna oil on working memory, emotional stresses, and aging process in perimenopausal and menopausal women
- Pilot plant for standardized herbal extract phase 2



(ต่อ)



# Infrastructure : 11 เครื่องขยาย Scaling –up pilot plant 2563–2565

**ภาคเหนือ**

- ❑ มหาวิทยาลัยเชียงใหม่
  - ✓ หน่วยขยายกำลังการผลิตอาหารฟังก์ชันแปรรูประดับภูมิภาค
  - ✓ หน่วยขยายการผลิต functional ingredients
  - Line ผลิตอาหารเสริมบรรจุแคปซูล
- ❑ มหาวิทยาลัยแม่ฟ้าหลวง
  - ✓ ศูนย์ขยายกำลังการผลิต functional ingredients สำหรับผลิตเครื่องสำอาง
  - เครื่องระเหยแบบสุญญากาศพร้อมอุปกรณ์ 20 ลิตร
- ❑ มหาวิทยาลัยนเรศวร
  - ✓ ศูนย์ขยายกำลังการผลิตและผลิต functional ingredients สำหรับอาหาร เครื่องสำอาง และผลิตภัณฑ์สุขภาพครบวงจร
  - เครื่องสกัดและระเหยตัวทำละลายแบบต่อเนื่อง

**ภาคตะวันออกเฉียงเหนือ**

- ❑ มหาวิทยาลัยขอนแก่น
  - ✓ ศูนย์ขยายกำลังการผลิต functional ingredients
  - สายการผลิตและทำเข้มน้ำมันพืชรและเครื่องดื่ม
- ❑ มหาวิทยาลัยเทคโนโลยีสุรนารี
  - ✓ หน่วยขยายการผลิต functional ingredients จากพืช
  - Microfluidizer

**ภาคกลาง**

- ❑ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี
  - ✓ ศูนย์ขยายสเกลการผลิต functional ingredients
  - Supercritical CO<sub>2</sub> Extraction 24 ลิตร
- ❑ มหาวิทยาลัยเกษตรศาสตร์
  - ✓ ศูนย์สาธิตและขยายการผลิตอาหารฟังก์ชันแปรรูปเพื่ออุตสาหกรรม
  - ✓ ศูนย์ขยายการผลิตและสกัดสารให้กลิ่นรสจากธรรมชาติ
  - ✓ หน่วยขยายสเกลการผลิตทางเทคโนโลยีชีวภาพและจุลินทรีย์สำหรับอาหาร
  - Microwave Extractor Set, Industrial chromatography
- ❑ สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง
  - ✓ หน่วยรับรองมาตรฐานเครื่องจักร Freeze-dryer เพื่ออุตสาหกรรม
  - High Pressure Processing

**ภาคใต้**

- ❑ มหาวิทยาลัยสงขลานครินทร์
  - ✓ หน่วยสาธิตและขยายการผลิตอาหารฟังก์ชันระดับภูมิภาค
  - ✓ หน่วยขยายสเกลการผลิต functional ingredients จากวัตถุดิบท้องถิ่นสำหรับอาหารฟังก์ชัน และอาหารเสริม
  - Line ผลิตอาหารด้วย extruder
- ❑ สำนักงานพัฒนาวิทยาศาสตร์และเทคโนโลยีแห่งชาติ (สวทช.)
  - ✓ หน่วยวิเคราะห์ทดสอบและสร้างความเข้มแข็งอุตสาหกรรมสารให้กลิ่นรส
  - ✓ หน่วยขยายกำลังการผลิตทางชีววิทยาสังเคราะห์ (synthetic biology)
  - Fermenter, Nanofiltration



# INNOVATIVE FOOD FABRICATION PILOT PLANT

โรงงานต้นแบบนวัตกรรมอาหารครบวงจร




ตัวอย่างเครื่องมือสกัดสมุนไพร





# Global Partnership Program

## Goal

To increase competitiveness by R&D to commercialization globally.



## Mechanisms

- Collaborate with global partners as a country strategic tool.
- Facilitate collaboration between the public and private sectors in Thailand and abroad.
- Encourage joint investment from firms of all sizes.

## FOCUSED PARTNERSHIPS 2024

From our strategic roadmap, the funding will be allocated to these following types of partnerships.



### Technology partnership

- Tech transfer/utilisation
- Technology search
- Opportunity studies
- Selection & Planning
- Legal Aspect/Funding
- Standard



### Market dev. partnership

- Growing current market
- Moving into new market segment
- Expanding into new geographical market



### Others

- Creative economy
- Investment
- Entrepreneur & talented development



# Global Partnership Program:

## Key stakeholders

Key stakeholders to enhance Thai's enterprises competitiveness for the global partnership funding.



- 01 Thai researcher from universities or research institutions
- 02 Thai enterprises
- 03 International researcher
- 04 International enterprises

# Global network 2020–2023



## 10 European & America countries

- US
- Canada
- UK
- Germany
- Spain
- Switzerland
- Austria
- Belgium
- France
- Sweden

## 9 Asia Countries

- Japan
- China
- South Korea
- Malaysia
- Singapore
- Philippines
- Cambodia
- Israel
- New Zealand

## 8 Industries

- Food, Agricultural & Biotechnology
- Pharmaceutical, Health & Medicine
- Automation, Materials & Robotics
- Circular Economy
- Digital Platform
- Energy
- Creative economy
- Others e.g. entrepreneurial skill dev.

## 61 International collaborations

- E.g. Fraunhofer, Germany
- Tokyo University of Technology, Japan
- Korea Advanced Institute of Science & Technology (KAIST), Korea
- Royal Academy of Engineering (RAEng), UK
- Centre for the Development of Industrial Technology (CDTI), Spain
- Biobase Europe Pilot Plant, Belgium
- University of Toronto, Green Technology Inc., Canada



# THAILAND FUTURE FOOD FOR SUSTAINABILITY

## Session 3:

# Building an Ecosystem for Future Food Research and Translation in Thailand



*Ms. Warisara Phungtonglor*  
Director, Investment Promotion Division 1  
Thailand Board of Investment



*Mr. Lertchai Lertvut*  
Deputy Secretary - General  
Food and Drug Administration



*Chaiyatorn Limapornvanich, Ph.D.*  
Director of Innovation Strategy  
National Innovation Agency



**Moderator**  
*Asst. Prof. Akkharawit Kanjana-Opas, Ph.D.*

Brought to you by:







# THAILAND FUTURE FOOD FOR SUSTAINABILITY

3 December 2024

Ballroom 1 (2<sup>nd</sup> floor)  
Sheraton Grande Sukhumvit Bangkok

