



Department of
Food Science and Technology

Future Opportunities for Young Food Scientists?: **A Perspective**

Dr.-Ing. Azis Boing Sitanggang

Department of Food Science and Technology, IPB University, Indonesia
IU FoST Early Career Scientist (ECS)

“The young scholars of today will be the pool from which the scientific leaders of tomorrow emerge... .

The science system of the future in any country can only be as strong as its pool of young talent today”

Young Scientists

- **Young Scientists:** a postgraduate or early career researcher of any discipline actively pursuing a research career, usually without being fully established, yet / $30 \text{ y.o} \leq \text{scientists} \leq 40 \text{ y.o}$ / a person starting a scientific career / a doctoral student or a university teacher without a doctoral degree, or a person who has had a doctoral degree for a period not exceeding 10 years

Source:

Friesenhahn, I. and Beaudry, C. (2014) The Global State of Young Scientists – Project Report and Recommendations, Berlin: Akademie Verlag.

- Young Scientists (nowadays) are in trouble or so it seems!
“Young scientists today face a harsher, more competitive, stricter, more dispiriting workplace than their bosses and senior colleagues did at the same stages of their own careers. Things are simply not the same as they were back in the day. They are more difficult”.

Source:

Editorial, Nature, 538, p. 427 (2016)

Young Scientists

Learning professional skills –
budgeting, grant-writing,
managing personnel

Do not have support staffs as
their senior colleagues have
with unavoidable
responsibilities (delegation)

Stable job prospects are almost
non-existent)

Family issues – young children,
spouses having different
professional obligations

Early-stage
professional
issues

Societal
challenges

Less time than
ever to do
research or
ponder big ideas

Lower productivity:

- Lower degree of key performance indicators (KPIs)

FOODS of the Future?

THE BRILLIANT INVENTION OF NICOLAS APPERT



Source:

Appert N: L'art de conserver, pendant plusieurs années, toutes les substances animales et végétales. Paris: Chez Patris et Cie. Imprimeurs-Libraires; 1810.

The start of modern food processing ..

- Packed hermetically in glass container
- Cooked in boiling water to destroy bacteria
- No preservatives added
- Had a long shelf life without refrigeration

FOODS of the Future?

- 1809*—Nicolas Appert, French cuisine chef, is awarded by Napoleon Bonaparte for the development of a food preservation technique (in glass packaging).
- 1810*—Peter Durand adapts Appert's technique for metallic packaging.
- 1815*—First canned goods factories are installed in England and France, countries that began supplying their troops with the product (cans opened with rifle or ax).
- 1828*—Invention of the hydraulic press by Van Houten.
- 1831*—Diversification of Cadbury's activities (founded in 1824), which began processing cocoa and chocolate.
- 1838*—Foundation of Knorr.
- 1840*—Foundation of Mars.
- 1841*—Dissemination of the appertization technique, canned goods are no longer exclusive to the military.
- 1845*—Foundation of Lindt.
- 1847*—Extraction of cocoa butter and foundation of the first chocolate factory (Fry's Chocolate and Cocoa).

- 1849*—"Easy-open" cans emerge (displacement and transfer belt).
- 1852*—Raymond Chevalier Appert patents the autoclave technique.
- 1858*—Development of the first patented can opener, used in the American Civil War.
- 1864*—Conception of the pasteurization technique by Louis Pasteur.
- 1866*—Foundation of Nestlé.
- 1869*—Foundation of Campbell.
- 1875*—Development of the first milk chocolate bar (partnership between confectioner Daniel Peter and Henri Nestlé).
- 1876*—Foundation of Hershey's.
- 1877*—Foundation of Quaker.
- 1878*—Foundation of Swift.
- 1879*—Rodolphe Lindt develops the conching technique.
- 1886*—Foundation of Coca-Cola.
- 1891*—Emergence of the Hormel Company, proprietor of the brand SPAM (Spiced Ham).
- 1896*—Foundation of Kellogg's and registration of the patent for production of cereal flakes.

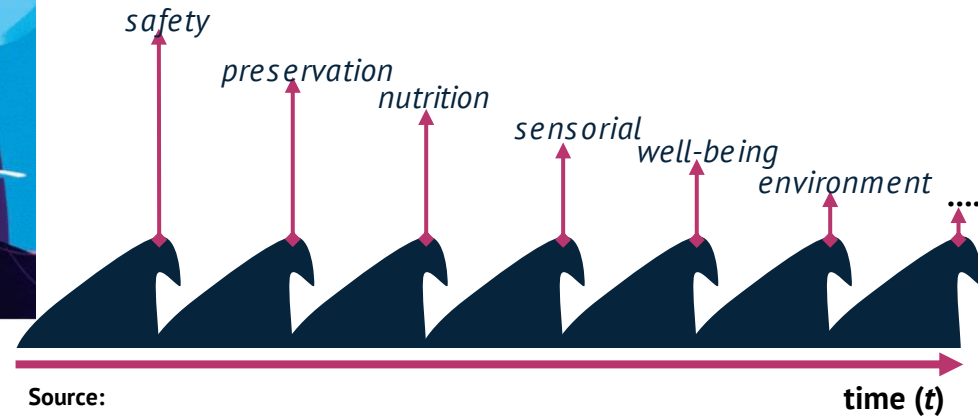
FOODS of the Future?



Source:

Foods of the future. SCIENCE. 366 (6471): 1306-1307 (2019)

- The challenges on food processing → sea waves across the time
- A new problem arise once we apparently solve the previous one.
- 'Apparently': *in fact*, the problems are never totally solved, but keep surviving as a revised challenge

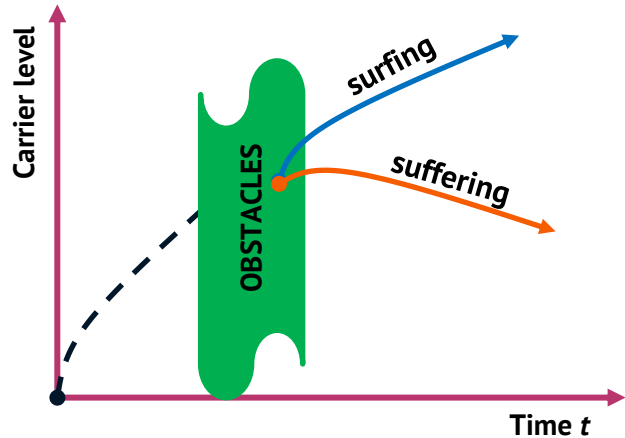


Source:

Current Opinion in Food Science 2020, 35:72–78

Young FOOD Scientists

- ❑ Young Scientists – Food Science Leaders of Tomorrow
- ❑ Young food scientists need to respond to the societal challenges of Food Science and sea-wave behavior of food processing challenges



The best early career scientists and scholars are better equipped than ever to foster more collaborative research and solutions for the global challenges that we are facing.



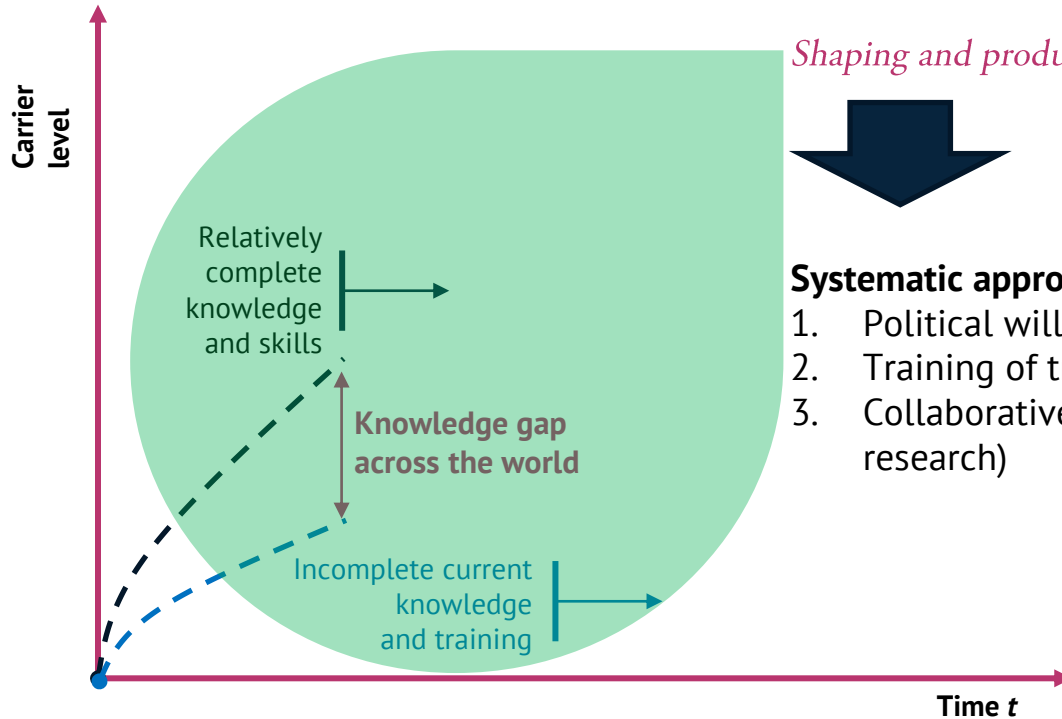
“Future opportunities for Young Food Scientists?”



Mindset leap:

We don't just seek the opportunities but also **CREATING** the opportunities

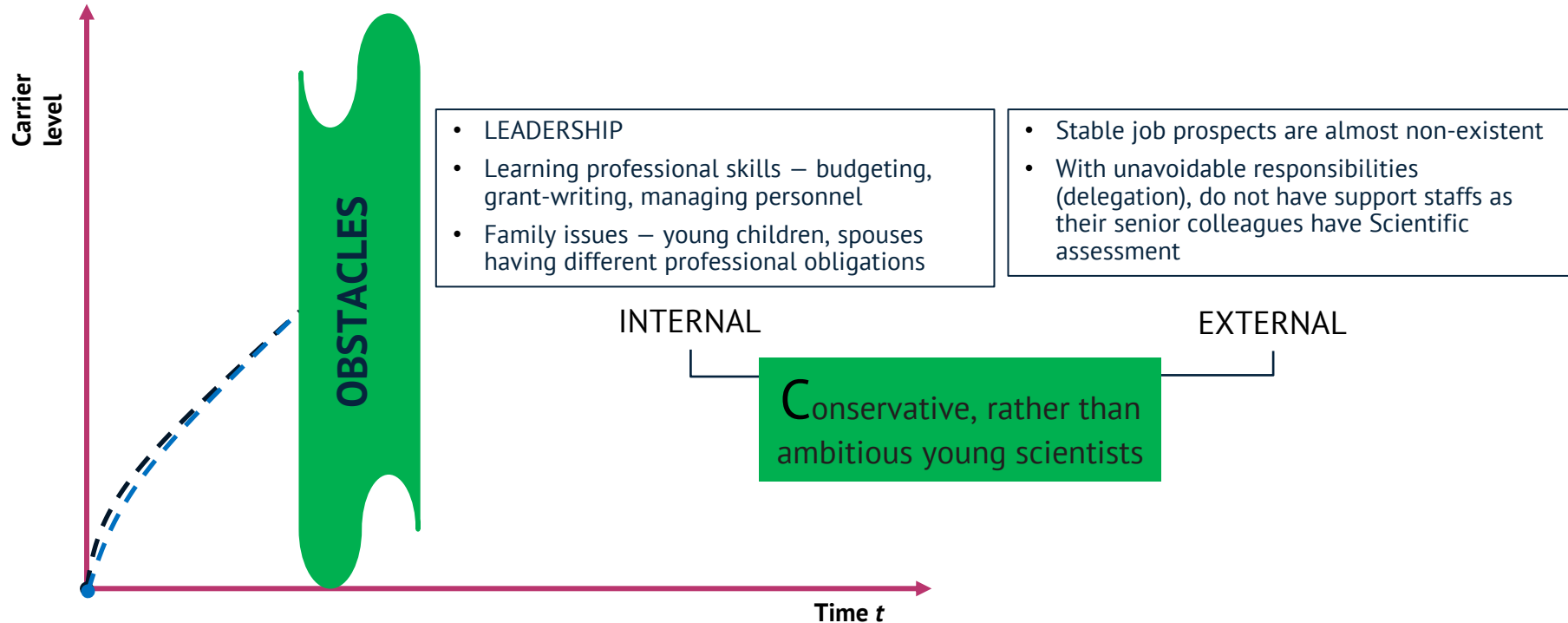
Young FOOD Scientists – SEEKING and CREATING OPPORTUNITIES



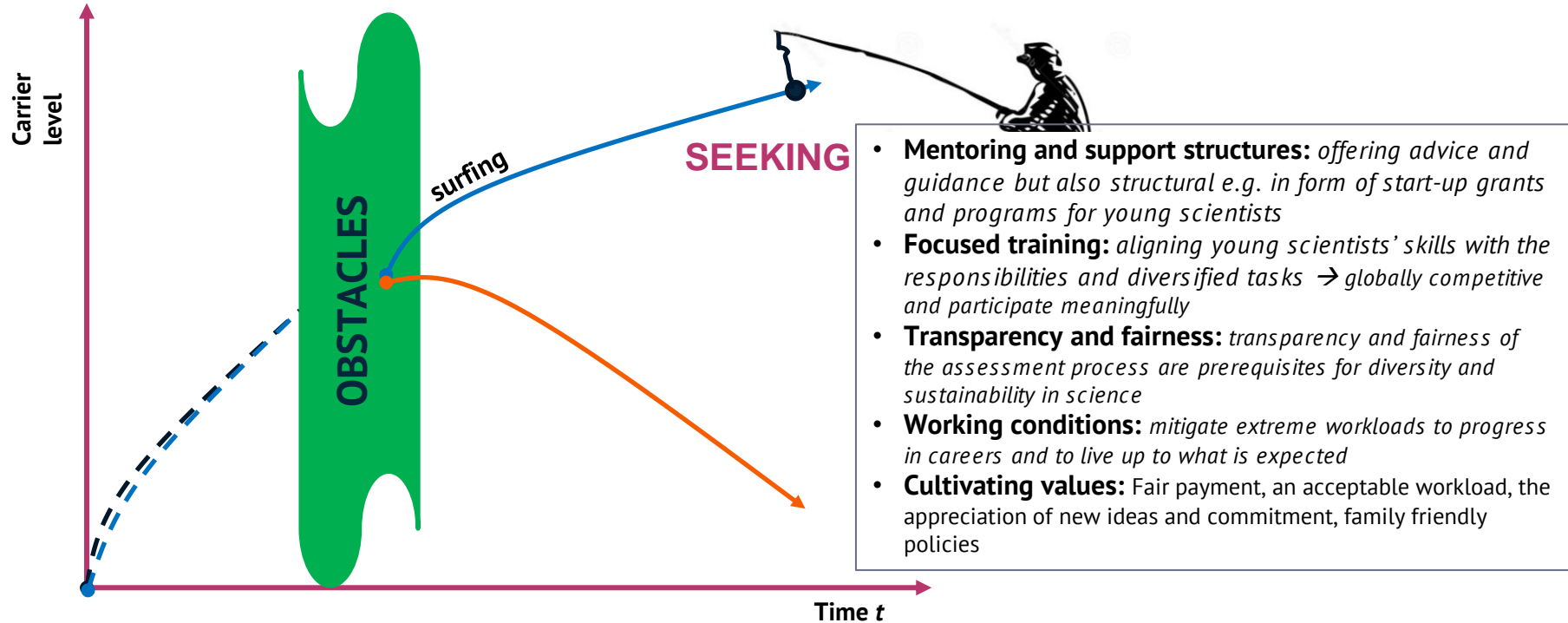
Systematic approach:

1. Political will → National education funding
2. Training of trainers
3. Collaborative education (joint program, joint research)

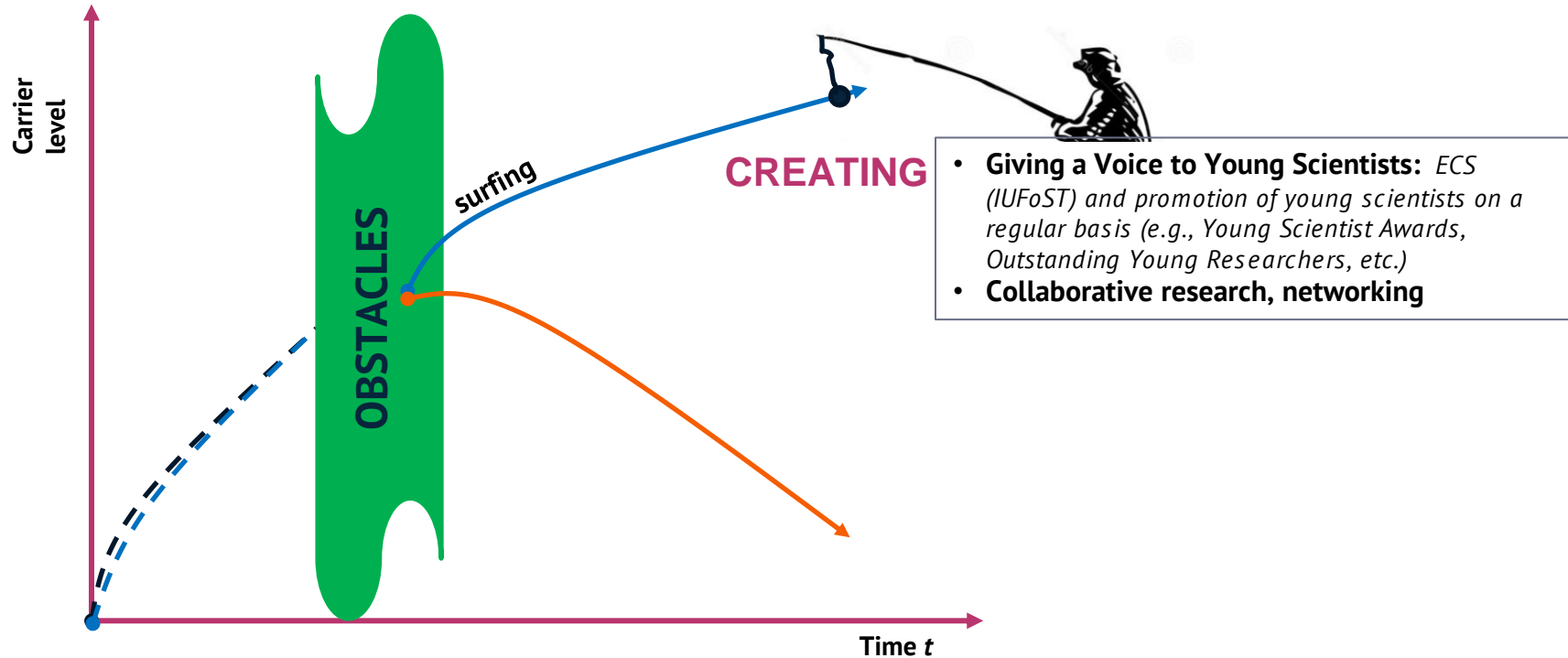
Young FOOD Scientists – SEEKING and CREATING OPPORTUNITIES



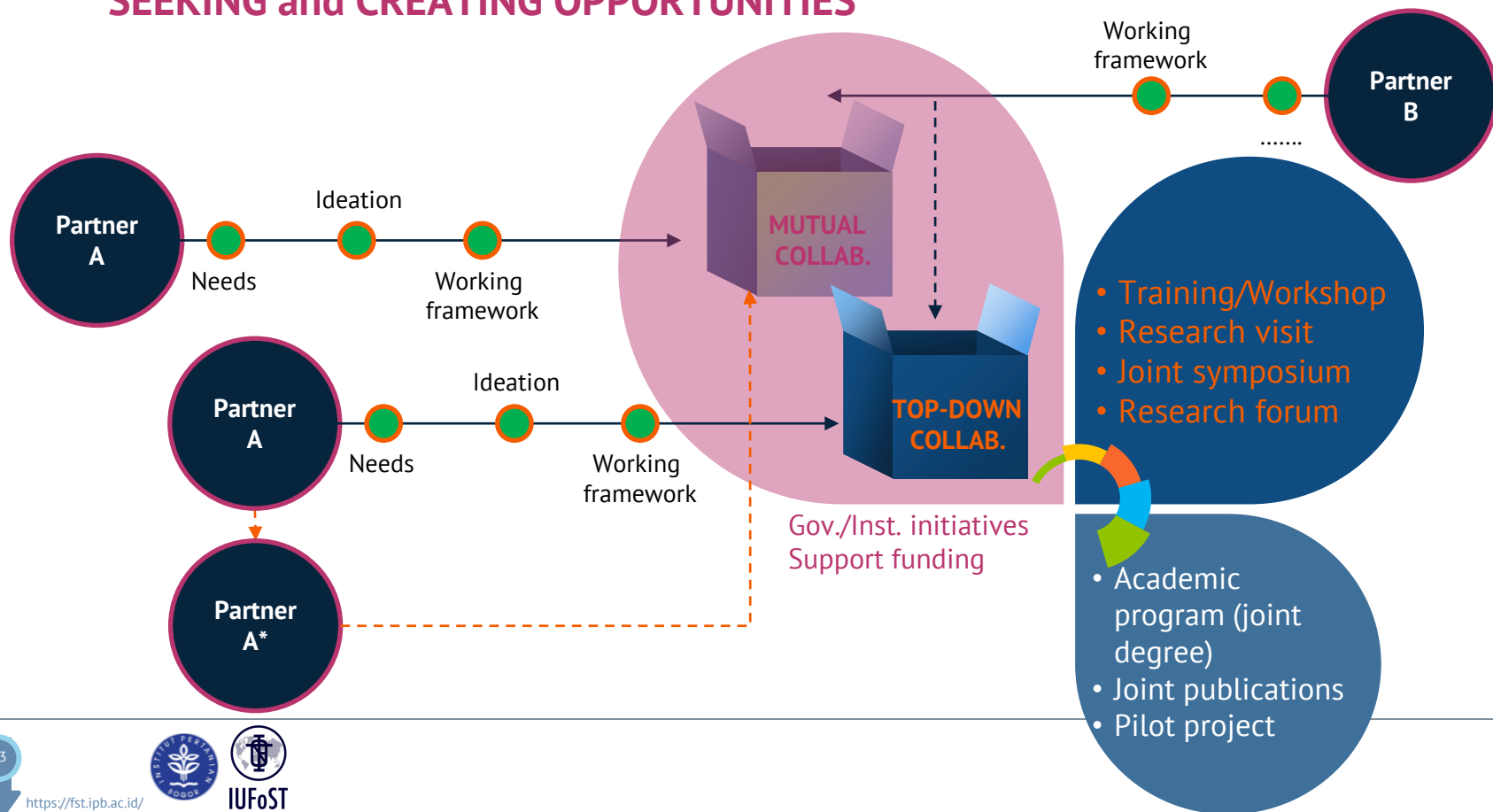
Young FOOD Scientists – SEEKING and CREATING OPPORTUNITIES



Young FOOD Scientists – SEEKING and CREATING OPPORTUNITIES



Collaboration amongst Young FOOD Scientists – SEEKING and CREATING OPPORTUNITIES





IUFoST



IPB University
— Bogor Indonesia —

Dr.-Ing. Azis Boing SITANGGANG

E-mail: boing.lipan@apps.ipb.ac.id