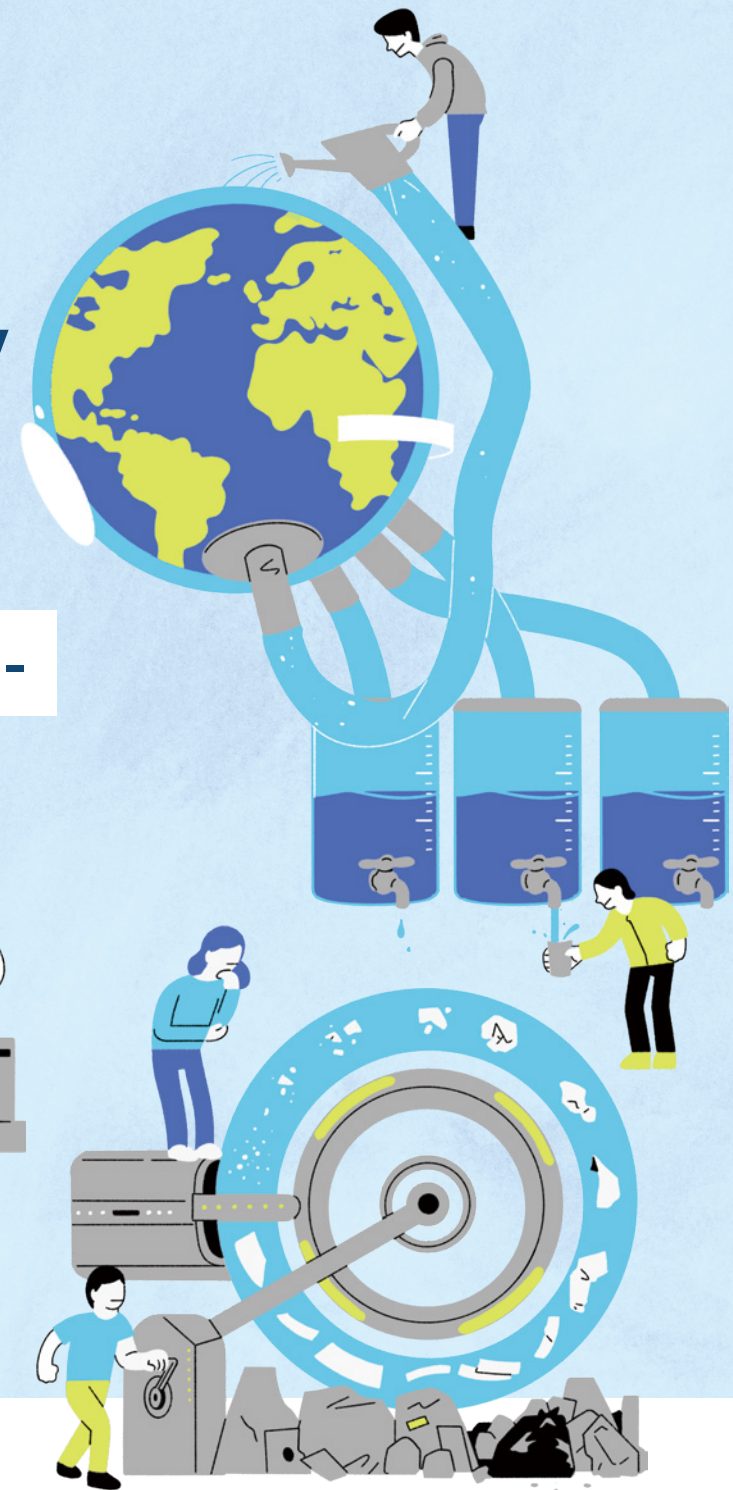


Realizing Ideal Society for 2050

- Water, Foods, and Resources -



CHANCE Secretariat

March 31, 2020

index

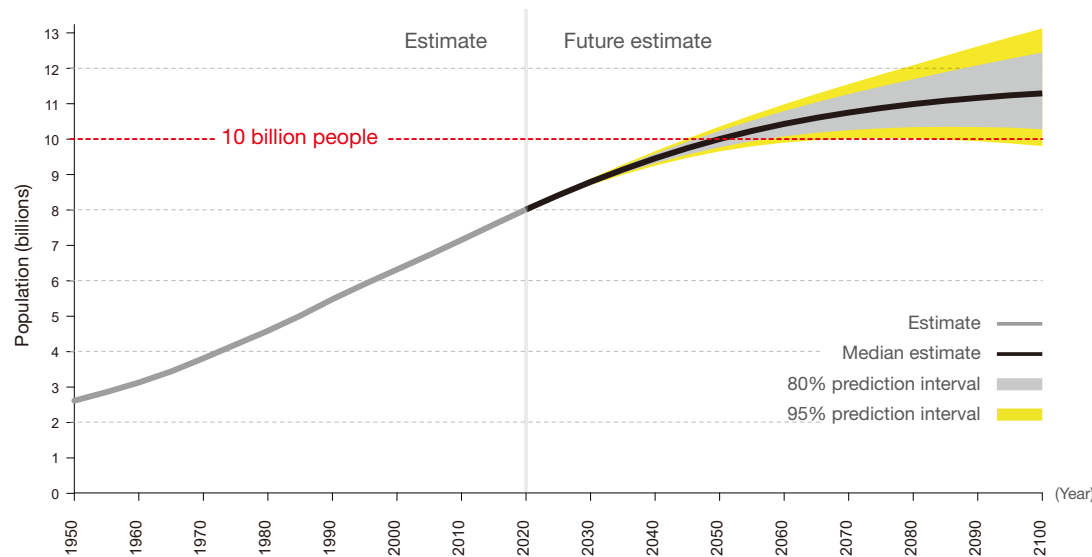
- 3,4** Summary
- 5** R&D and social implementation, and their challenges
- 6,7** What is the open platform for co-designing future society, CHANCE?
- 8** What will happen in Japan in 2050?
- 9** What will happen in the world in 2050?
- 10,11** We will face critical issues in water, food, and resources in 2050
- 12** Social issues have nexus to each other
- 13** How is the ideal future toward the society in 2050? (Discussion in a workshop)
- 14,15**  In order to respond to water demand
- 16**  What can we do?
- 17**  Mitigate uneven water distribution
- 18,19**  In order to overcome food shortage
- 20**  What can we do?
- 21**  Begin with visualization of food distribution
- 22,23**  In order to reduce wastes
- 24**  What can we do?
- 25**  Use resources based on the premise of circulation
- 26** What picture of 2050 do you draw?
- 27** What do water, food, and resources have in common?
- 28** Issues not discussed in depth during the workshop
- 29** We want to remove the frameworks and take action on social issues
- 30,31** Resources and issues of CHANCE
- 32** List of workshop participants (1)
- 33** List of workshop participants (2)
- 34** Colophon

Summary

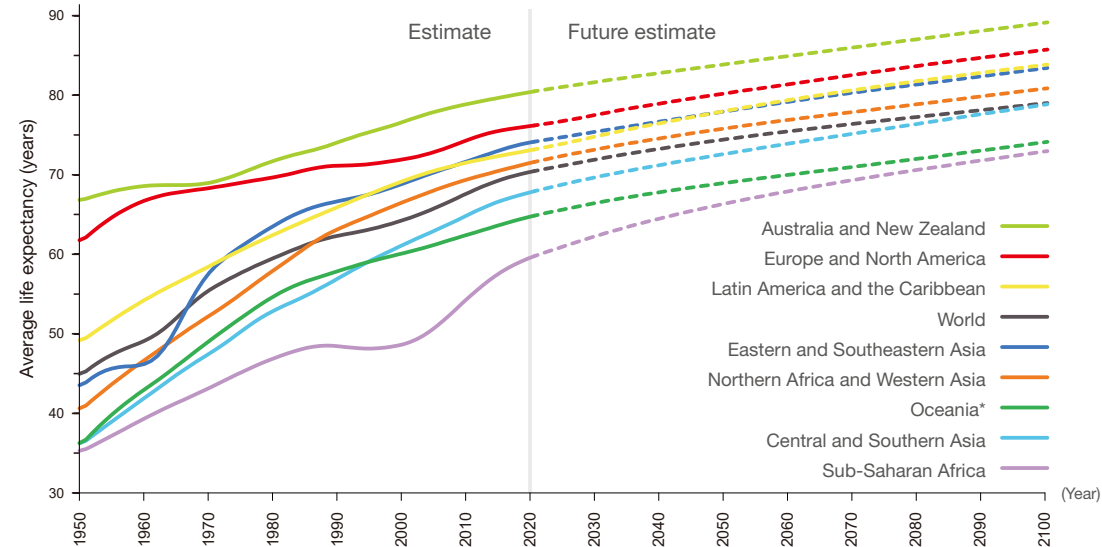
In 2050, the world will enter the era of a population 10 billion and a 100-year life and will lack material resources.

The global population is expected to reach 9.4 to 10.1 billion, and the average life expectancy in the world is 77.1 years in 2050. It means that about half the population will live more than 100 years in the era. This would be accompanied by shortages in the fundamental materials for human beings to survive, such as water, food, resources, and energy.

As persons who live in 2020, we established the framework for open discussions beyond boundaries and scenario building to realize the ideals, that is to say the open platform for co-designing future society, CHANCE, and exchanged views on uneven water distribution, food loss, and resource cycles in 2050.



Source: Prepared with reference to *World Population Prospects 2019*, Department of Economic and Social Affairs of the United Nations Secretariat



* Australia and New Zealand are not included in Oceania.

In 2050,
•3.9 billion people suffer from serious
water shortages.

p.10

•Food demand is
considerably increased.

p.10

•Mineral resources several times
the deposits are required.

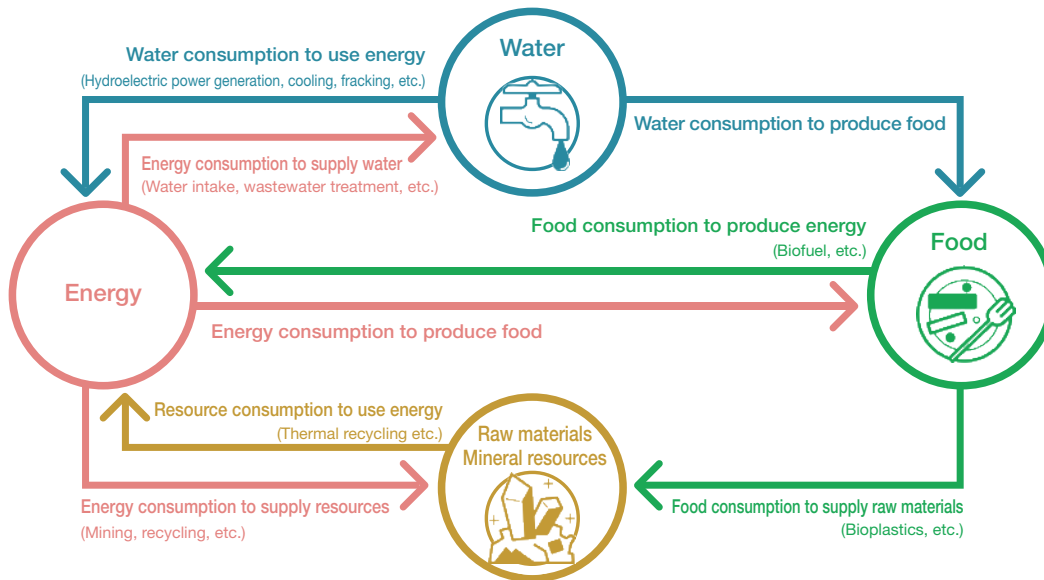
p.22

Summary

The resources of water, food, mineral resources, and energy are mutually linked, in other words, they are in a nexus relationship.

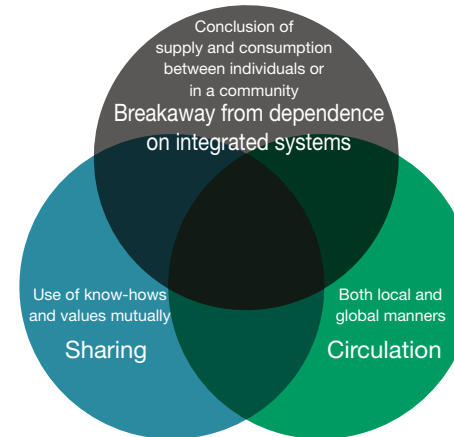
To resolve every issue, it is **necessary to consider the whole as a single system and avoid contradictions and conflicts.**

Through discussions, we found the factors common to the solutions to the issues on water, food, and mineral resources for 2050.



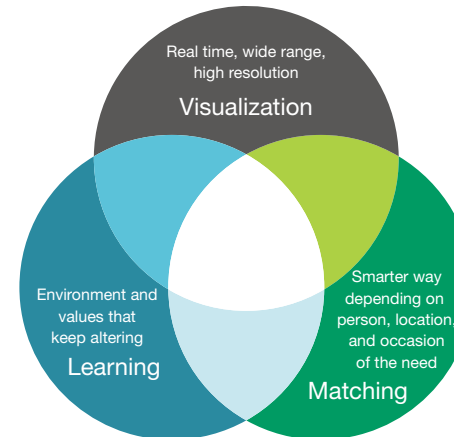
Source: Prepared with reference to the materials provided by Mitsubishi Research Institute, Inc.

<Values in common>



Though the great growth of industry in the past led to a wealthy society, it has caused problems and is making them increasingly serious now. These values are different from traditional ones and should be required to solve them.

<Means in common>



In order to solve the issues on material resources throughout the world, it is necessary to visualize and be aware of changing resources in a real time manner. An appropriate matching of people and resources is enabled only after the necessity is fulfilled. Besides, if more people learn the changes in the natural environment and values, the society and the lifestyle of individuals are also changed, and the solution to the issues will come closer.

What is effective in answering social issues is not only just thinking but also **taking concrete action with the use of the specialty of each person.**

How is the society that you want to create?

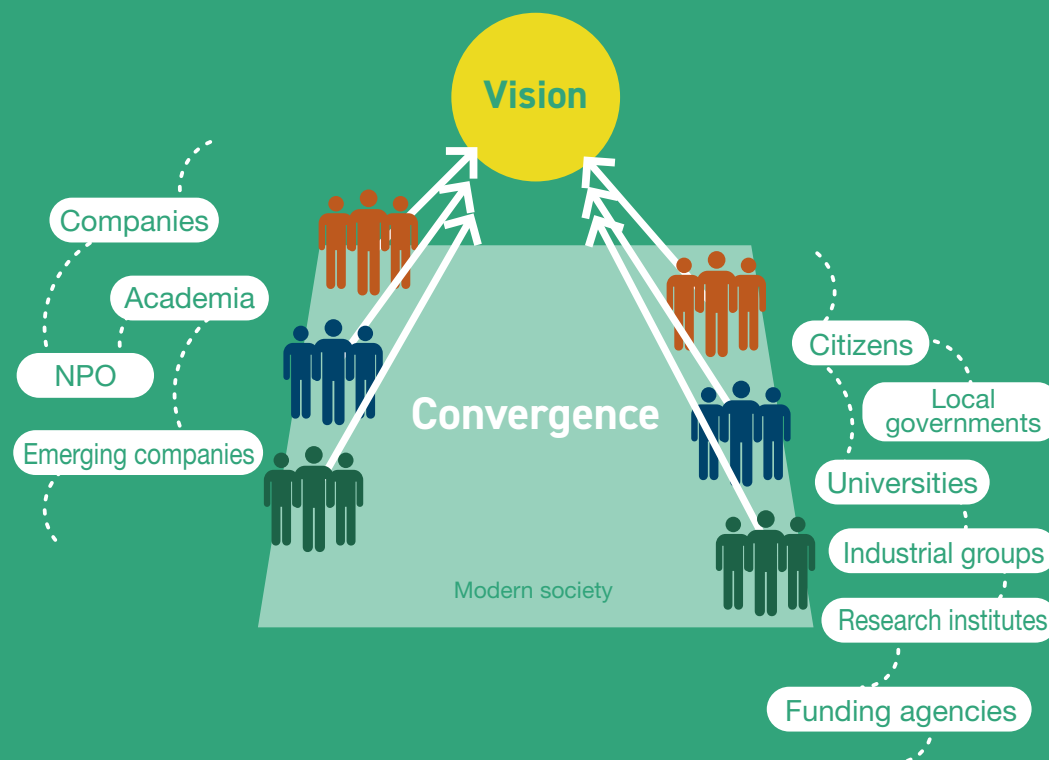
R&D and social implementation, and their challenges

Lively discussions to solve the social issues take place anywhere in any social categories, such as scientists, industry, policymakers, and citizens.

However, is the vision of an ideal society shared by society? Social issues cannot be solved only by science or only from the business aspect. It is required that they collaborate to develop solid action.

People in the science field or its strategy planning have difficulty in leading excellent technologies to a meaningful revolution in the world even if they could improve them more. In particular, we see the lack of their ability to concretely describe the future where the mission of solving social issues is already accomplished and to design and realize innovation for it.

On the other hand, though more companies engage in solving social issues, it seems in reality that their actions are taken only from a short-term viewpoint of several years because they are always supposed to produce substantial outcomes. Intrinsically, they should initiate definite actions based on a long-term perspective. Otherwise, it is difficult to reach a solution for complex social issues.



What is the open platform for co-designing future society, CHANCE?

As already described, the vision ranging from research and development to industrialization and social reform is essential to solving social issues. However, the circumstances interfere with performing activities based on a long-term vision in every social category. In order to break out of this existing condition, we thought **that the framework for open discussion beyond boundaries and scenario building to realize the ideal was necessary.**

As a consequence, the open platform for co-designing the future society, CHANCE (CHALLENGE-driven Convergence Engine), was born.

The thirteen organizations and the three individuals listed on the right collaborate with us, and each of them has a highly specialized network.

CHANCE adopts the form of a network of networks where they do not proceed toward the same goal as a single organization but each member brings their specialty together while maintaining their autonomy. This framework thus intends to generate a synergistic effect and to lead to the practice of concrete measures.

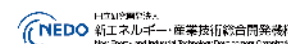
Collaborator organizations



国立研究開発法人
科学技術振興機構
Japan Science and Technology Agency



慶應義塾大学SFC研究所
X.SDG Lab.



経済産業省
新エネルギー・産業技術総合開発機構
New Energy and Industrial Technology Development Organization



Japan Bosai Platform



Future Center Alliance Japan



MRI 株式会社三菱総合研究所



理化学研究所

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Media Artist

Shoji Komai

Associate Professor at Nara Institute of
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Senior Engineer at Strategy Division,
Global Center for Social Innovation,
Hitachi, Ltd.; Representative of Social
Innovators Global Network (SIGN) for PLANET

What is the open platform for co-designing future society, CHANCE?

We are eager to contribute to achieving the Sustainable Development Goals (SDGs)^{*1} and realizing Society 5.0^{*2} through this activity.

The SDGs are a collection of 17 global goals to be achieved by 2030 and have the following five features:

- Universal: Action by all countries including developed countries
- Inclusive: “No one left behind” as fulfillment of the human security principle
- Participatory: Roles for all stakeholders
- Integration: Integrated economic, social, and environmental initiatives
- Transparency: Periodic follow-up

^{*1} Source: *Promoting SDGs that Create Regional Revitalization*, Cabinet Office, Cabinet Office, Government of Japan

Society 5.0 is a vision of human-centered society that balances economic advancement with the resolution of social problems by a system of high degree of convergence between cyberspace (virtual space) and physical space (real space).

SUSTAINABLE DEVELOPMENT GOALS



^{*1}



^{*2} Source: *Society 5.0*, Cabinet Office, Government of Japan

What will happen in Japan in 2050?

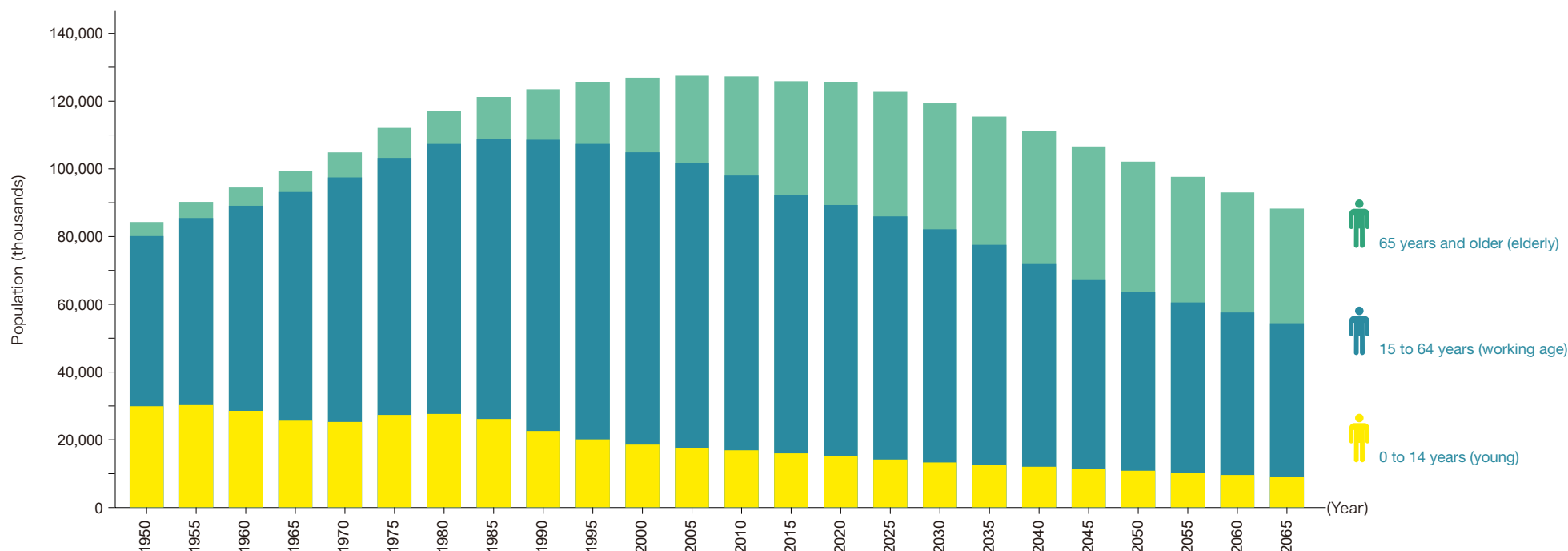
The declining birthrate and aging population are driven much faster in Japan. The working-age population decreases considerably.

In 2050, what will our world be like?

The birthrate is decreasing and the population is aging as of 2020 in Japan, and this trend is expected to accelerate continually. Data from the future population estimates of Japan show that in 30 years, in 2050,

the population in Japan will decrease to 101,920,000 and the working-age population from 15 to 65 years old will only accounts for 52% of the entire population. This is supposed to cause various problems and changes.

Transition and future estimates of aging population



Source: Prepared with reference to *Population Estimates*, Ministry of Internal Affairs and Communications for 1950 to 2015; and *Future Population Estimates in Japan (Estimates of 2017)*, National Institute of Population and Social Security Research

What will happen in the world in 2050?

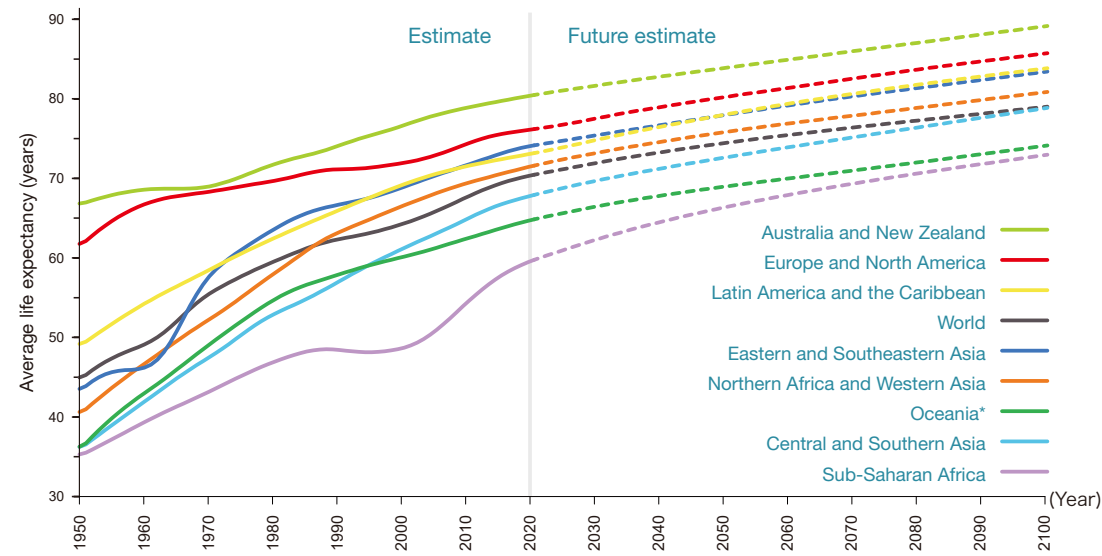
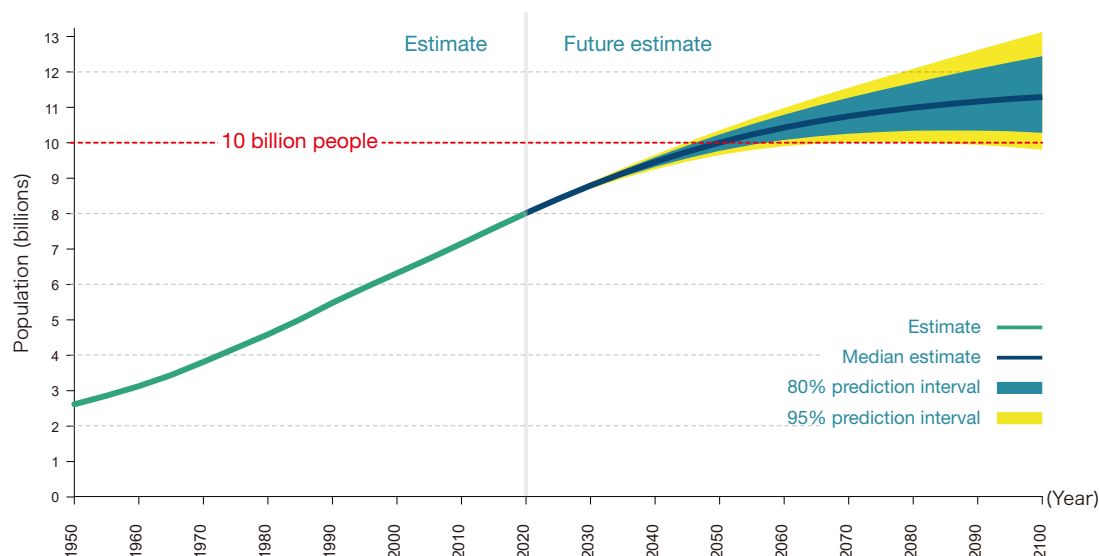
Ever-increasing world population

What is the global population in 2050 when the working-age population is remarkably shrunk in Japan? While the population in Japan is continuously decreasing, the world population keeps increasing. It gradually grows even after 2020, and it is expected to reach 9.4 to 10.1 billion in 2050.



The era of a population of 10 billion and a 100-year life comes to the world.

The world's average life expectancy is 72.6 years as of 2020, and it is expected to reach 77.1 years in 2050. It means that about half the population will live more than 100 years in the era. In other words, the era of a population of 10 billion and a 100-year life arrives in 2050.



Source: Prepared with reference to *World Population Prospects 2019*, Department of Economic and Social Affairs of the United Nations Secretariat

* Australia and New Zealand are not included in Oceania.

We will face critical issues in water, food, and resources in 2050

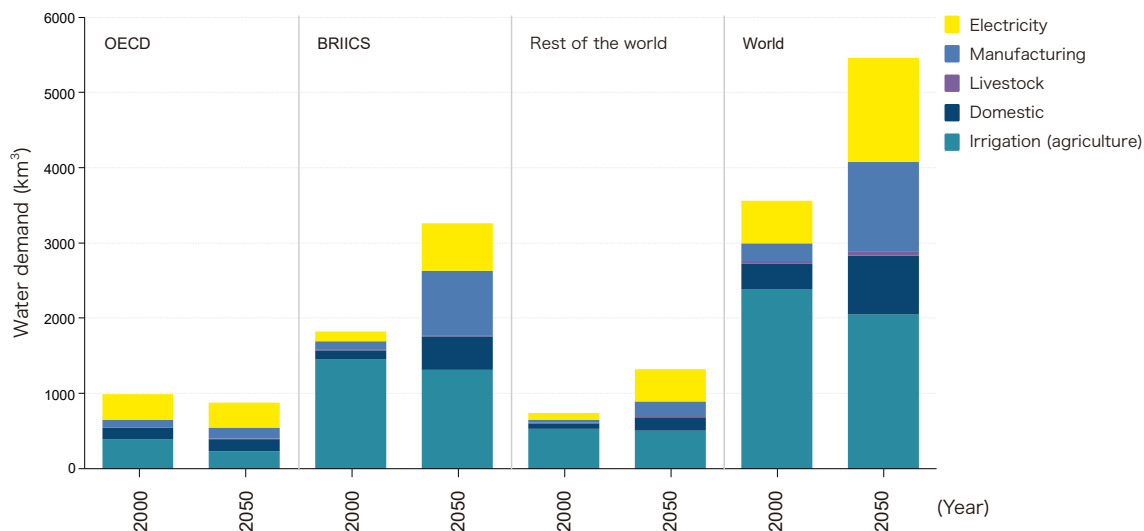
When the era of a population of 10 billion and a 100-year life comes in 2050, we have to face the question of how human beings will support 10 billion people.

In particular, the material resources that serve as the foundation of human life are limited. Now, these three material resources are particularly focused: water, food, and mineral resources.

Enlarging water demand

The water demand all over the world was about 3,600 km³ in 2000 and two-thirds was used for agriculture.

Between 2000 and 2050, the water demand is expected to grow mainly because of industrial use in manufacturing (+400%), electric power generation (+140%), and domestic use (+130%), which is the increase by 55% as a whole. It is also projected that 3.9 billion people (over 40% of the world's population) are likely to suffer from serious water stress by 2050.



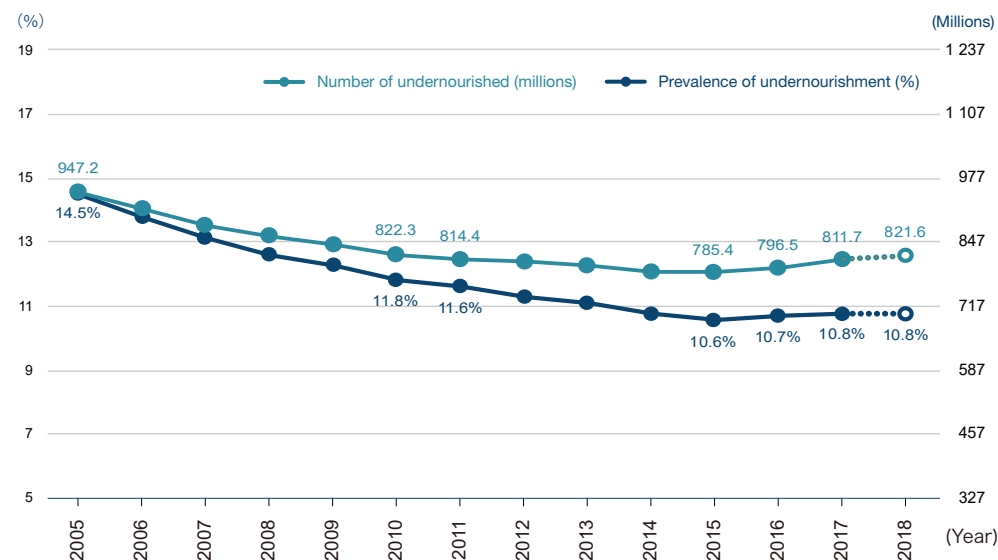
Source: Prepared with reference to *Environmental Outlook to 2050*, OECD

Worsening food shortage

Though the population experiencing poor nutrition once decreased, it has turned to a gradual increase in the most recent several years again. As of 2019, about 821 million people, which corresponded to more than one-ninth of the world's population, did not have sufficient food. If it goes on, the problem of food shortages is expected to become more serious as the global population rises.

Meanwhile, a study suggested that roughly one-third of food produced all over the world was abandoned.*

* According to *Global Food Losses and Food Waste* (2011), FAO (the Food and Agriculture Organization)



Source: Prepared with reference to *State of Food Security and Nutrition in the World 2019*, FAO

We will face critical issues in water, food, and resources in 2050

Increasing waste

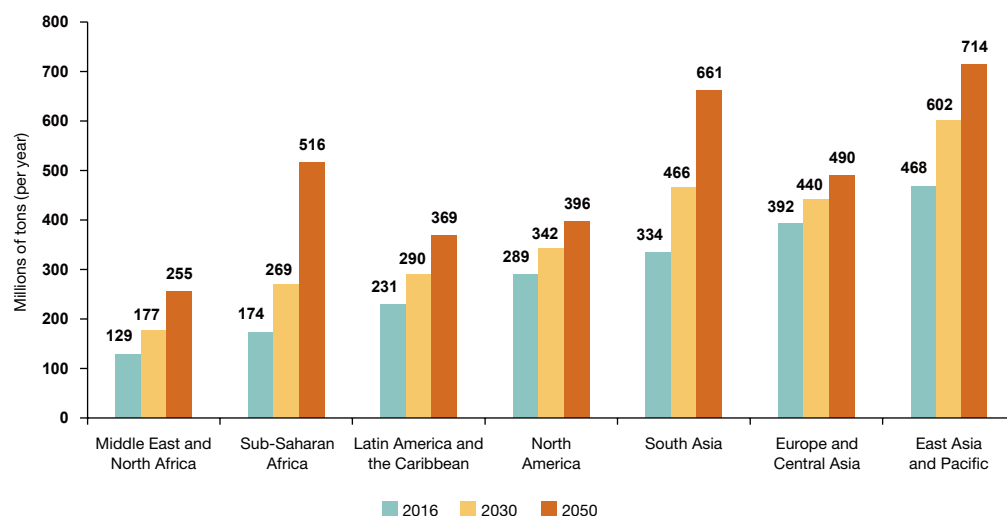
In the context of rapid urbanization and population growth, **global waste is expected to increase by 70% from the present level by 2050.**

In particular, plastic waste is regarded as a major issue. If they are not properly collected and disposed of, water paths and the ecosystem may be seriously affected in the coming several centuries.

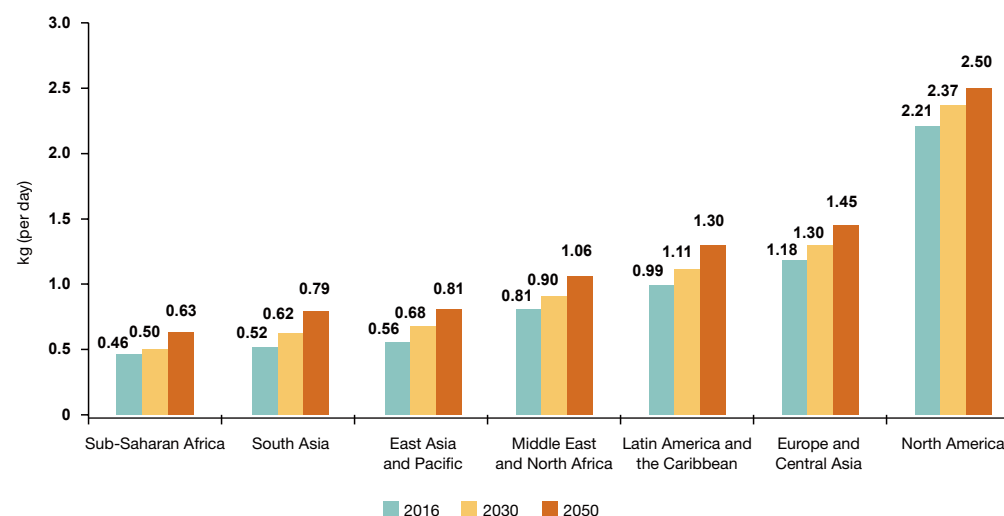
The East Asia and Pacific regions now account for almost one-quarter (23%) of total waste in the world. The amount of waste from the Sub-Saharan Africa region is projected to increase to about three times the current level by 2050 and that of South Asia is to about two times.

Projected waste generation by region

a. Total projected waste generation



b. Projected waste generation per capita

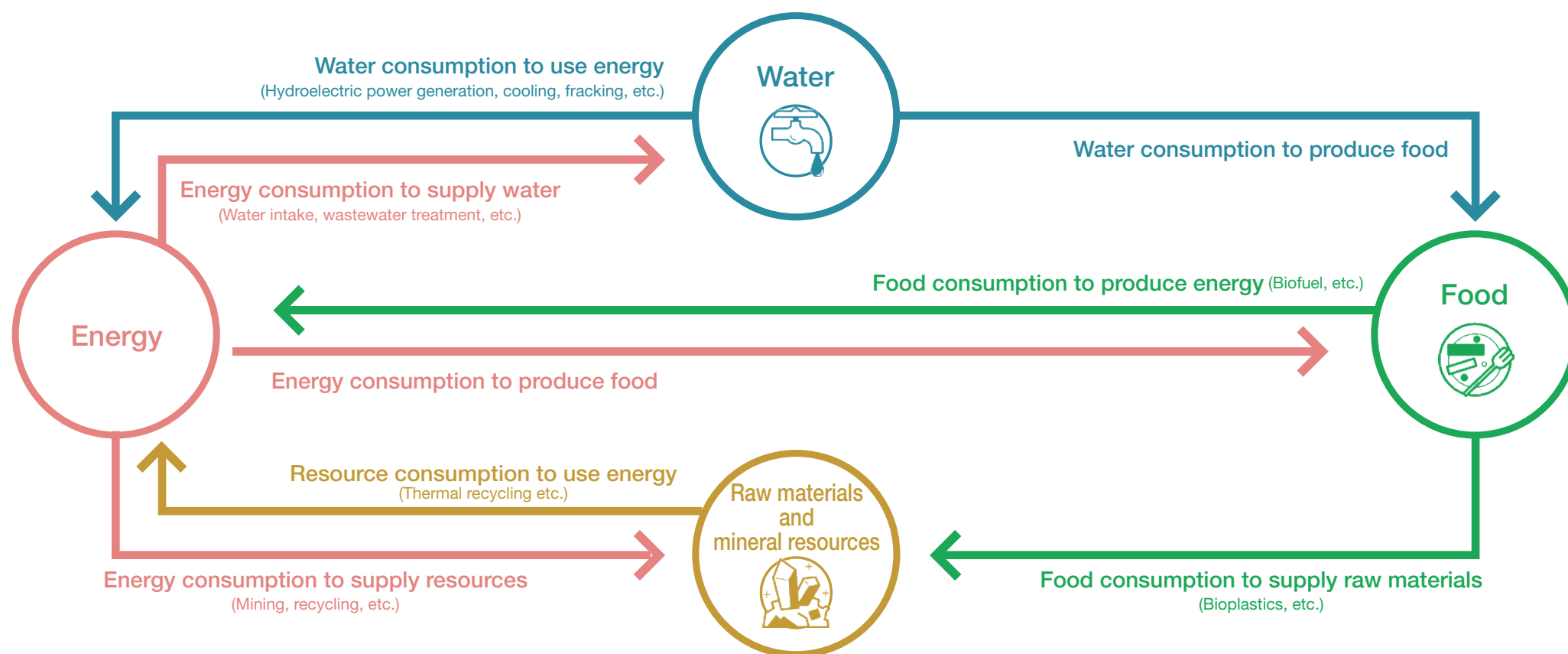


Source: Prepared with reference to *What a Waste 2.0 - A Global Snapshot of Solid Waste Management to 2050*, The World Bank

Social issues have nexus to each other

The resources of water, food, mineral resources, and energy are fundamental to the survival of human beings, and they are mutually linked, in other words, they are in a nexus relationship. To resolve every issue, it is necessary to consider the whole as a single system and avoid contradictions and conflicts.

Many social issues are also in a nexus relationship the same as resources. The SDG indicators therefore have nexus to each other.

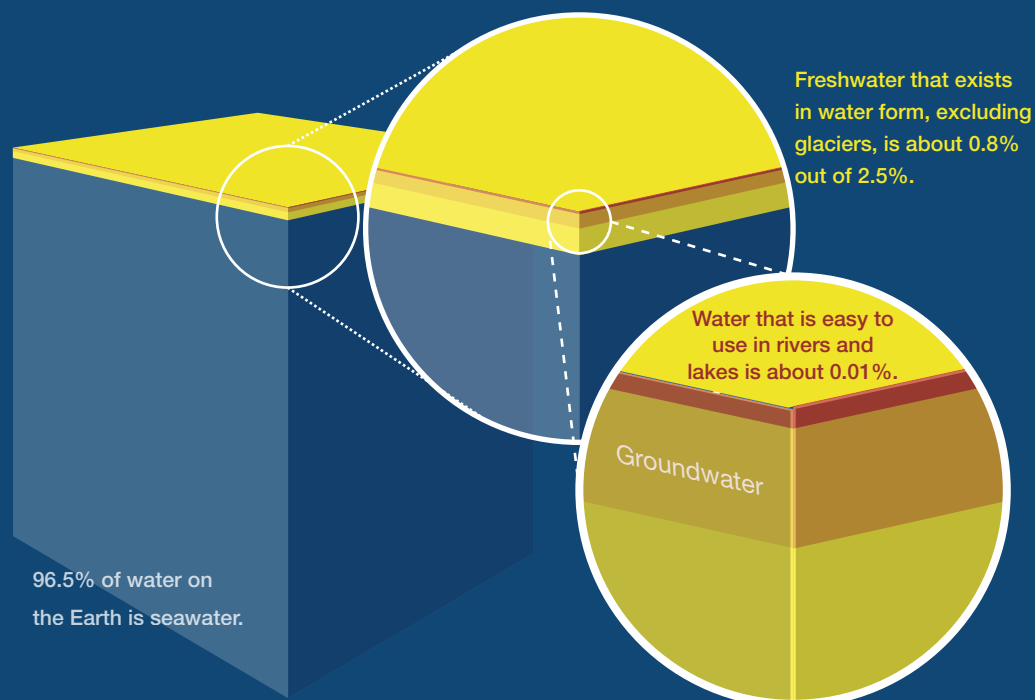




In order to respond to water demand

The quantity of water that people can use easily is extremely small.

While two-thirds of the Earth's surface is covered with water, the majority is sea water, and as little as 2.5% exists as fresh water. Most fresh water is either ice or glaciers, and about 0.8% of the total water of the Earth is found as groundwater and river stream water. Moreover, the greater part of it is groundwater, and the water that is present in the state easy for people to use, such as rivers and lakes, is only about 0.01% (100,000 km³) of all water. This tiny volume of water is used by the whole population of human beings at present.



Source: Prepared with reference to *World Water Resources at the Beginning of the Twenty-First Century*, UNESCO

In order to increase available water



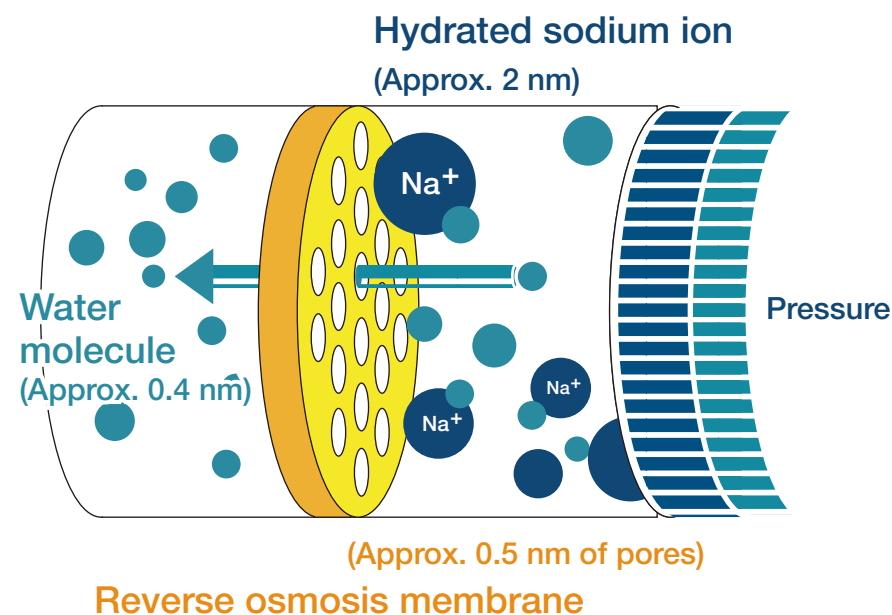
These activities have already started.

(Three case examples)

Case 1

World-leading R&D of reverse osmosis membrane for seawater desalination

They have developed water treatment membranes with nanocarbons as the technique to obtain clean fresh water from seawater at low cost. (Shinshu University)



Source: Prepared with reference to "Conversion of seawater to safe drinking water - to eliminate world water shortage," JSTnews August 2019 Issue

In order to increase available water



These activities have already started.

(Three case examples)

Case 2

World's first portable water purifier bottle equipped with heavy metal remover

They have developed the portable water purifier bottle NaTiO using sodium trititanate, the world's first heavy metal remover featured by prompt removal of diverse heavy metals. (Shinshu University and Toclas Corporation)



Portable water purifier bottle NaTiO

Source: Quoted from "Release of a new product jointly developed by Shinshu University and Toclas Corporation, Portable Water Purifier Bottle NaTiO, equipped the world's first material for removing heavy metals," Shinshu University

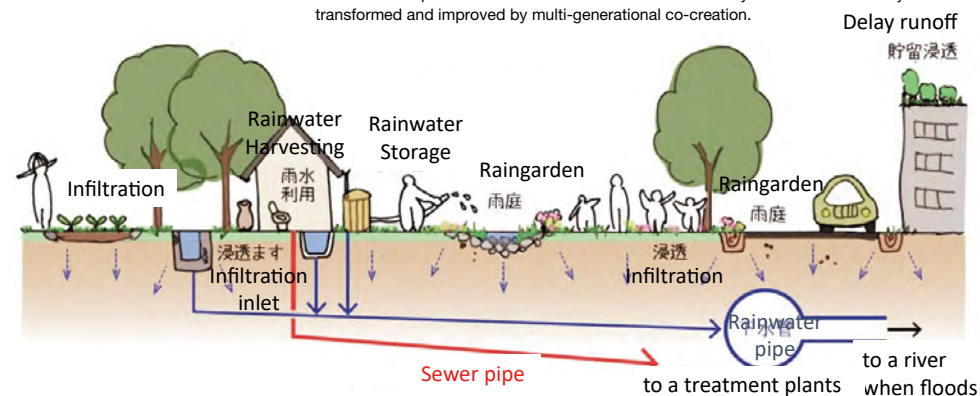
Case 3

De-centralized water management to store rainwater and make it penetrate into ground

They intend people to foster a sense of water management on the course of collecting and using rainwater while dealing with restoration of sound ecosystem in the watershed. The concept called the Amamizu (Rainwater) Society is formed, and concrete models are given. This distributed water system suggested is sustainable, redundant, and multi-purpose. (Kyushu University)

Amamizu(Rainwater) Society

We define "Rainwater Society" as a society that under the de - centralized water management system, multi - generational people cooperate to store, infiltrate, and harvest rainwater and increase green spaces at everywhere in a watershed region. Focusing on water which feature is multi - faceted, we envision Rainwater Society as a model of modern social problem - solution method. Rainwater Society should be continually transformed and improved by multi-generational co-creation.



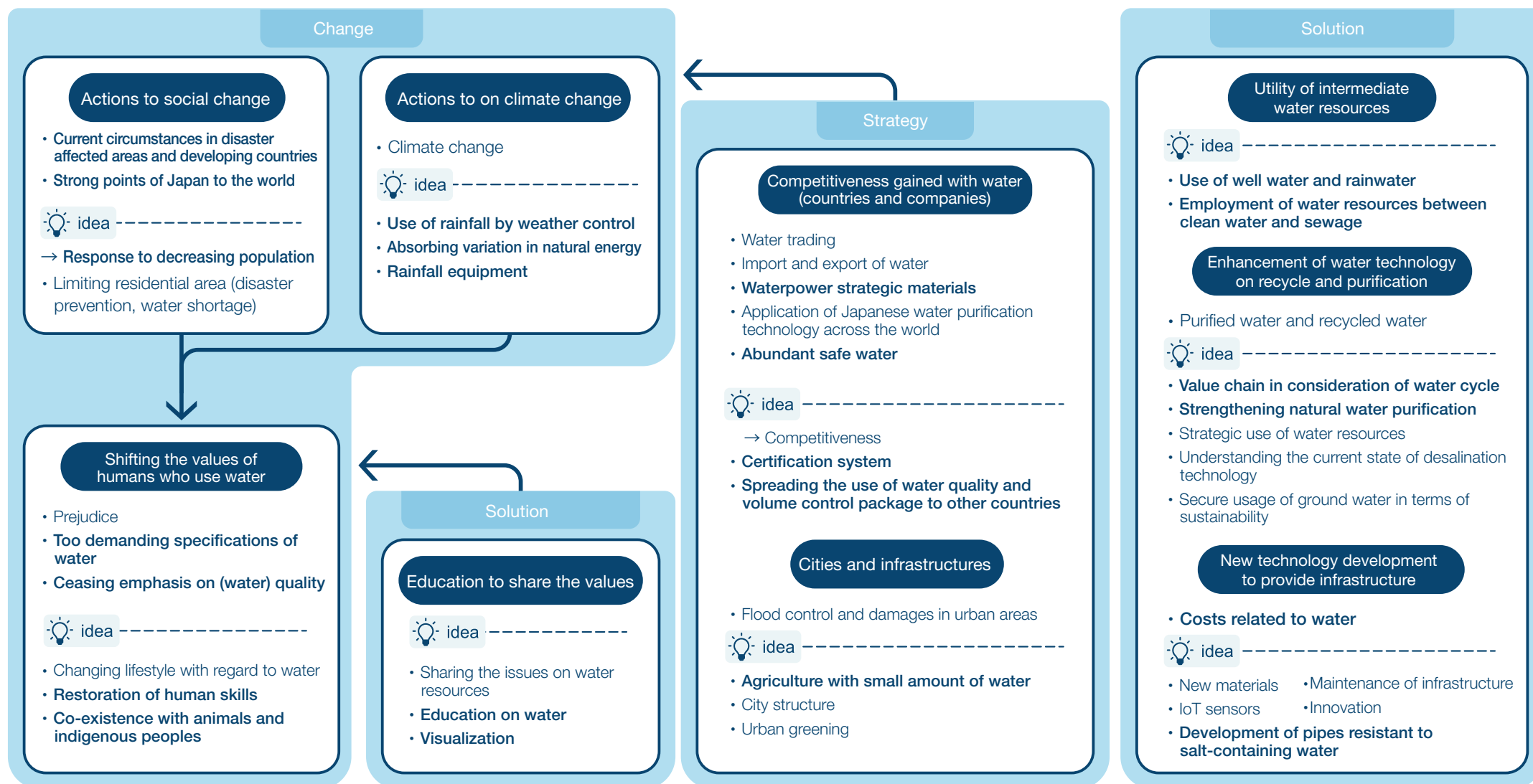
Source: Quoted from the research and development execution report of 2017 on the R&D Project, *Distributed Rainwater Management for a Sustainable Well-being Society*, Yukihiro Shimatani



What can we do?

The following was discussed in the workshop held on Friday, February 7, 2020.

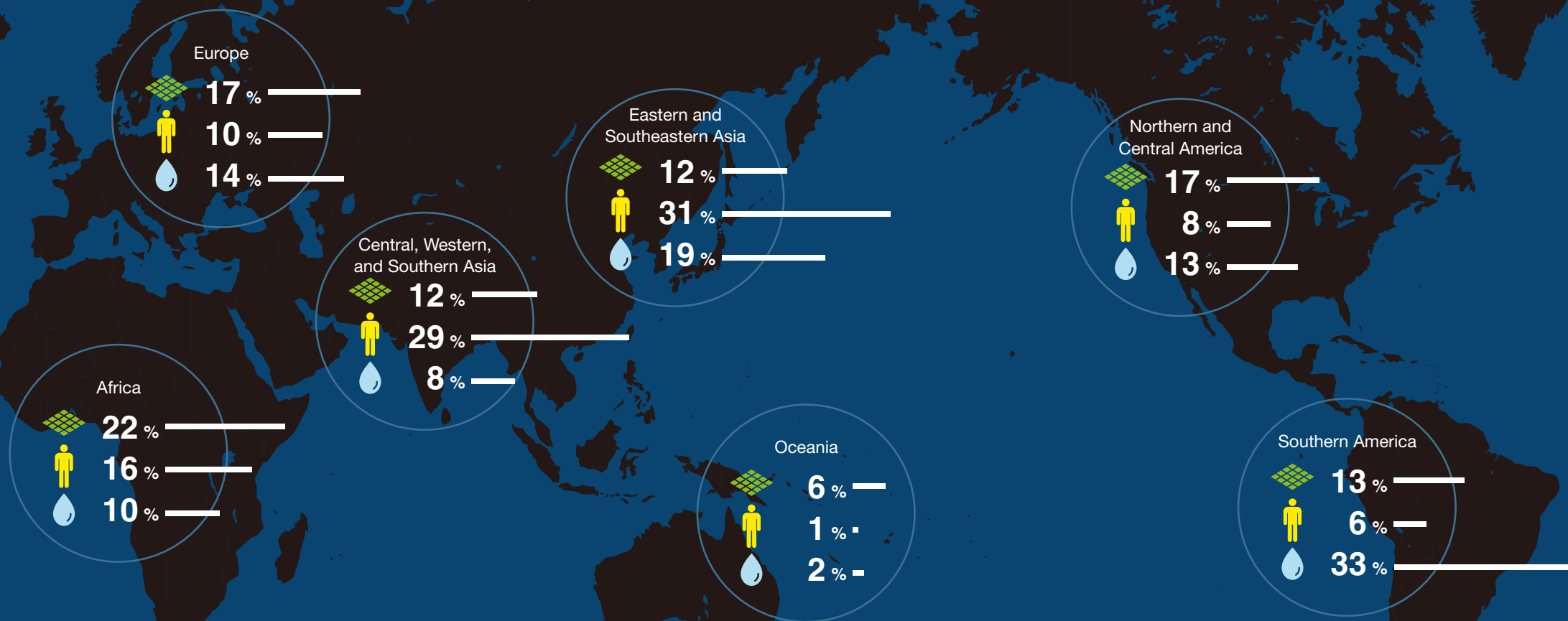
From a bird's-eye view to the entire discussion, the premise of the issues, i.e., uneven water distribution, is recognized.





Mitigate uneven water distribution

What we particularly think is important after the workshop and following discussions is the fact that the distribution of water resource is quite uneven between areas.



Comparison of water resource volume, population, and area by region around the world

Area
 Population
 Water resources

Source: Prepared based on the data as of April 2016 published in AQUASTAT, FAO

When the population and land data is compared in the figure, you would see how unevenly water resources exist. This uneven distribution of water in the world is a significant issue that should be addressed internationally and it is difficult to take effective countermeasures only from the science and technology aspect.

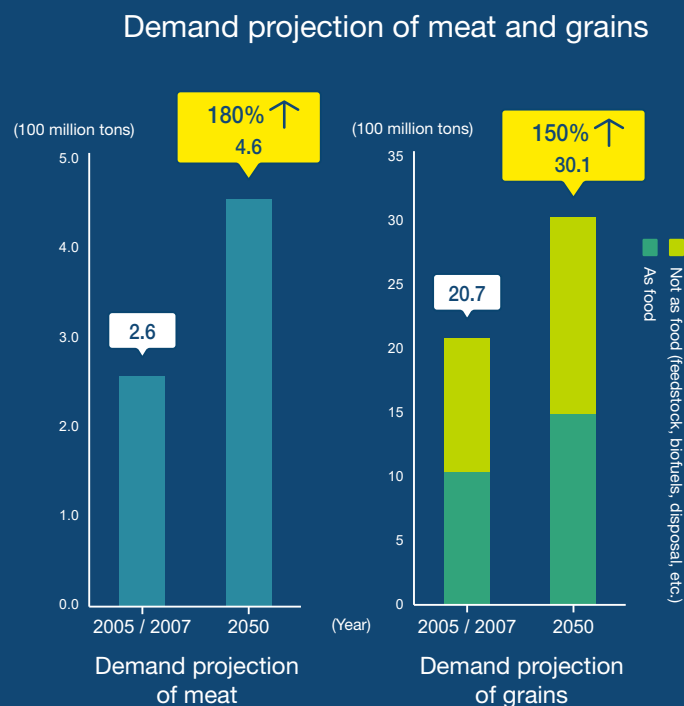


In order to overcome food shortage

In 2050, the demand of meat is remarkably increased.

The Protein Crisis is supposed to be a large problem in the world of the year 2050. The livestock industry requires a huge amount of feedstock because cows and pigs eat a lot of plants to grow. Therefore, the efficiency of production is regarded as lower than that of grains. In order to continue the supply of proteins with reduced environmental load all over the world, beans with rich proteins are produced, and the activities for entomophagy are encouraged. In addition, development of new technology on cultured meat to artificially produce edible meat is anticipated.

Another emerging activity is company cooperation to review the food industry itself that has been established until now and to address the issues of food loss, shortfalls in proteins, and environmental pollution that cannot be solved by a single company.



Source: Prepared with reference to *World agriculture towards 2030/2050*, FAO

In order to avoid food crises



These activities have already started.

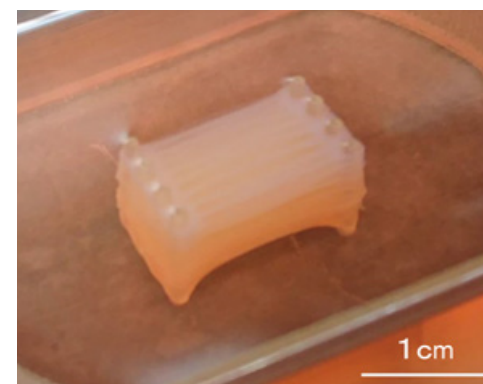
(Three case examples)

Case 1

Development of the production technology for next generation-meat using 3D tissue engineering techniques

The mainstream of conventional development of cultured meats tried to produce minced flesh and even the formation of cultured beefsteak has never been realized yet.

Having established the culture technique for bovine muscle fibers on a mass scale and the method to build cultured steak bites of larger than 1 cm in size, they aim to realize cultured beefsteak that society accepts. (Institute of Industrial Science, The University of Tokyo)



Source: Quoted from "The first step to the practical application of Cultured Beefsteak that has true texture of meat. World's first success of producing steak bites-like bovine muscle fibers," Institute of Industrial Science, The University of Tokyo

In order to avoid food crises



These activities have already started.

(Three case examples)

Case 2

Regenerative food system business of Industry-up Studio

The new industry co-creation studio, Industry-up Studio, which gives birth to open-innovation type value creation projects, was started in July 2019. One of their projects is the regenerative food system business. They systematically reveal the issues of the industry and target increasing the value of the whole industry with the cooperation of food system-related manufacturing and services, including scientists, producers, food manufacturers, distributors, retailers, and shops, by coping with minimization of negative impacts and creation of new values based on the idea of common good. (SUNDRED)



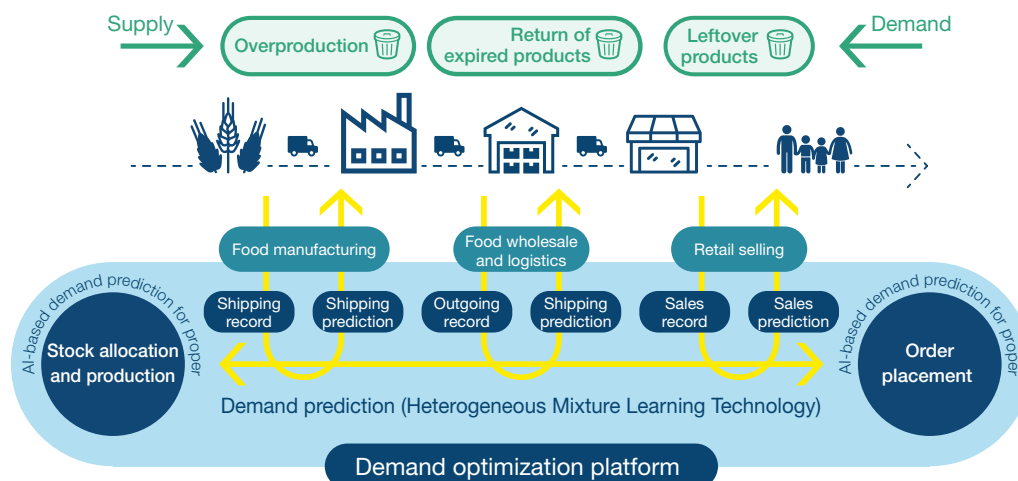
新産業共創スタジオ
INDUSTRY-UP STUDIO

Source: Quoted from *Regenerative food system business*, Industry-up Studio

Case 3

Shared optimization platform to eliminate food mismatch

They provide the Supply and Demand Optimization Platform based on AI (artificial intelligence) technology in order to share and use information of the entire value chain to get rid of mismatch between supply and demand. (NEC)

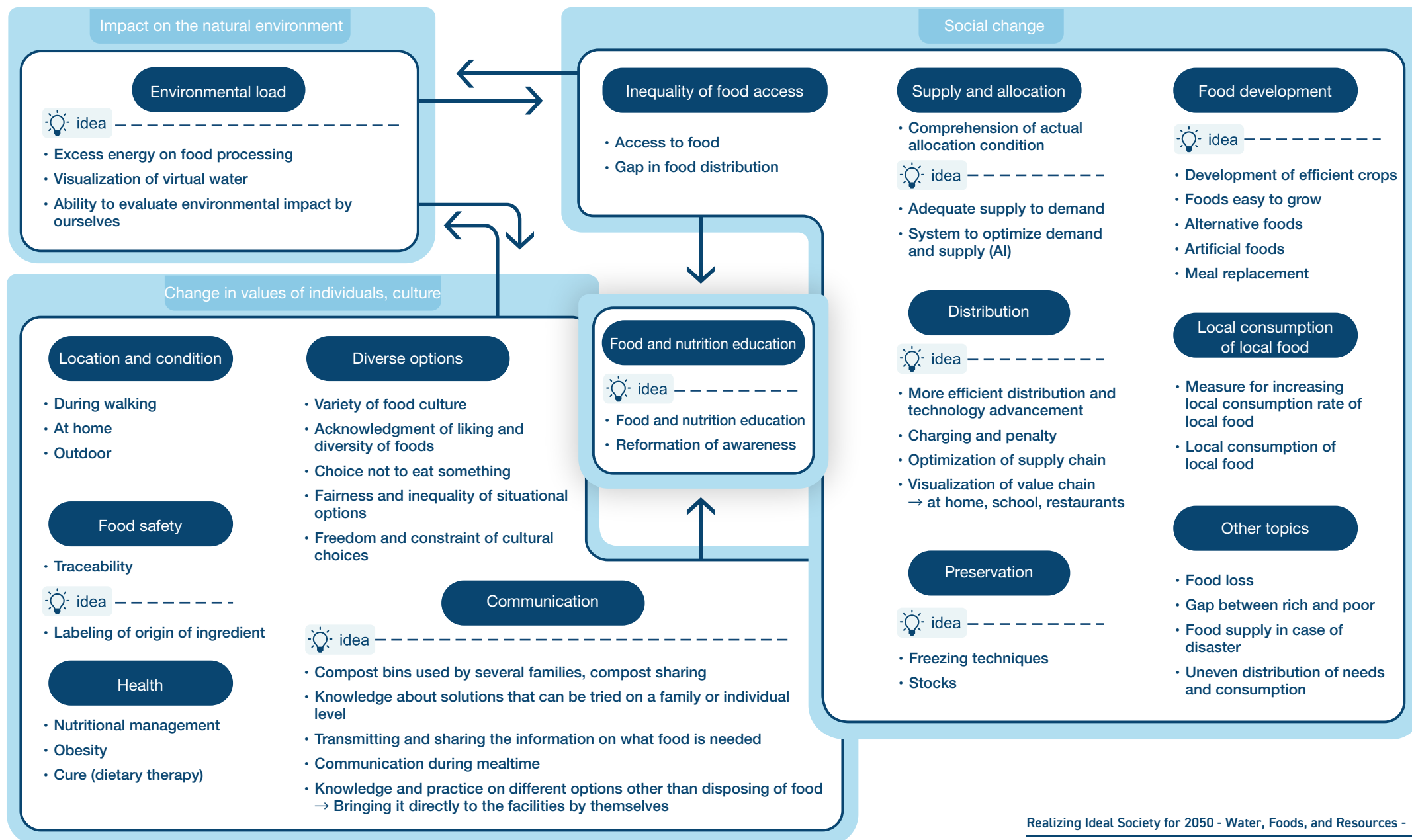


Source: Quoted from *Report on social value creation, Industry Eco-System, The key for the solutions, Value Chain Innovation*.
Reduction of food loss and waste will be an international mission, wisdom



What can we do?

The following was discussed in the workshop held on Friday, February 7, 2020, and finally converged to the point of visualization and reduction of food loss.





Begin with visualization of food distribution

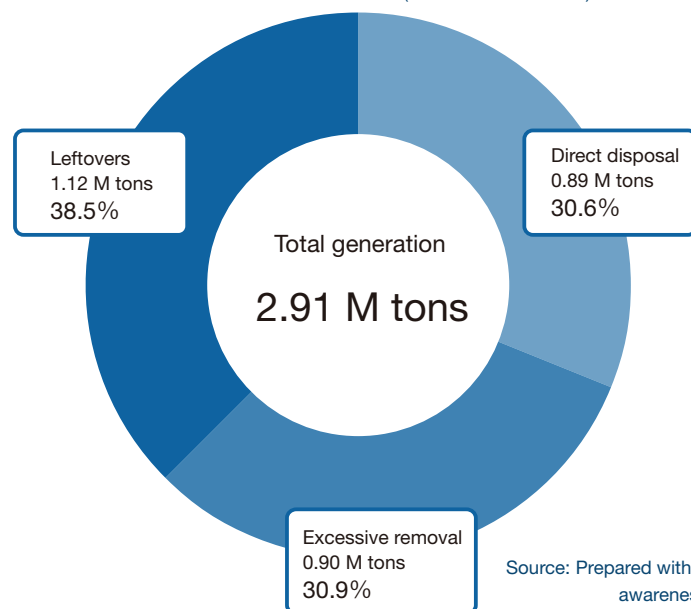
The urgent issue about food is to visualize and reduce food loss. In Japan, the Act on Promotion of Food Loss Reduction came into effect in 2019, and there is a trend to make it a national campaign. It was estimated that in Japan, we generated about 6.43 million tons of food loss, which was edible but disposed of.

Almost half of the food loss occurred at home. The three reasons are leftovers, excessive removal (even the part that should be eaten is

taken out), and direct disposal. This means that reducing food loss at home of each individual has a great impact. For overall reduction of food loss including the one generated by business operators, it is required to build a national system where the flow of food from production to transport, sales, and consumption is visualized and adequate foodstuffs are delivered to the place where they are needed.

Breakdown of household food loss

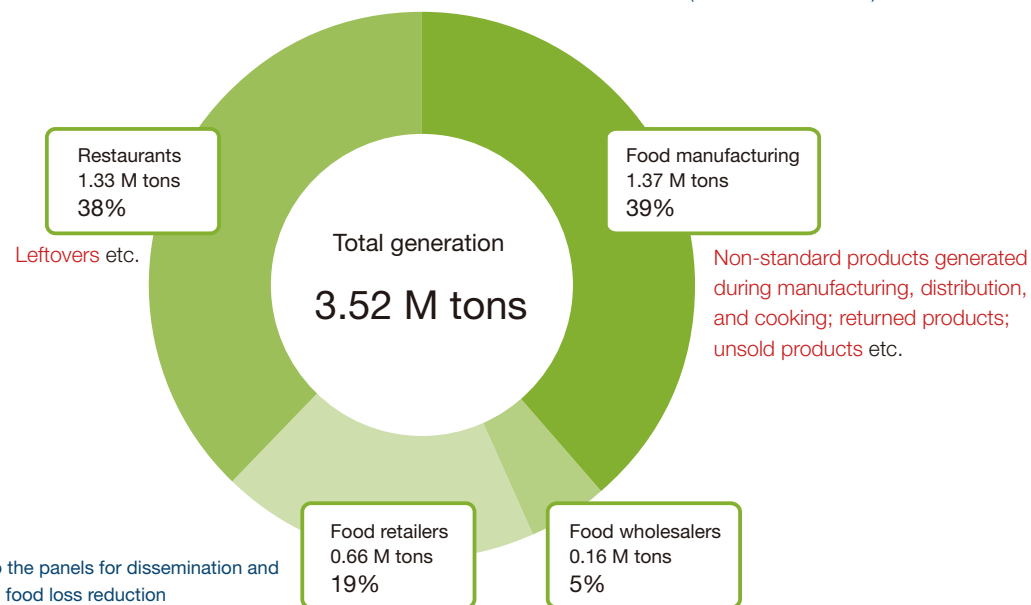
(Estimates of FY 2016)



Source: Prepared with reference to the panels for dissemination and awareness raising on food loss reduction by the Ministry of the Environment, Government of Japan

Breakdown of operational food loss (edible portion) per business type

(Estimates of FY 2016)





In order to reduce waste

Mineral resources several times the deposits are required.

It is reported that the existing amount of reserves of many kinds of metals will become insufficient for use, and the **demand of some metals is expected to be several times** greater than the amount of their respective deposits by 2050.

Present reserves almost run out in 2050.

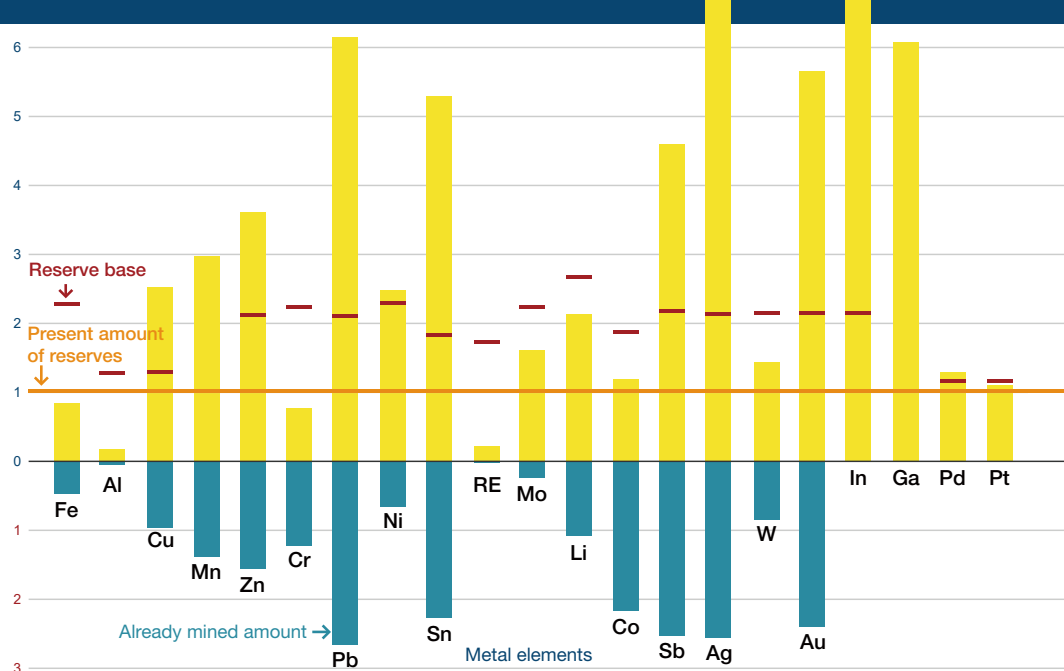
Iron (Fe), molybdenum (Mo), tungsten (W), cobalt (Co), platinum (Pt), palladium (Pd)

The amount of use exceeds twice the present reserves by 2050.

Nickel (Ni), manganese (Mn), lithium (Li), indium (In), gallium (Ga)

The amount of use exceeds the reserve base by 2050.

Copper (Cu), lead (Pb), zinc (Zn), gold (Au), silver (Ag), tin (Sn)



In order to reduce resources to dispose of



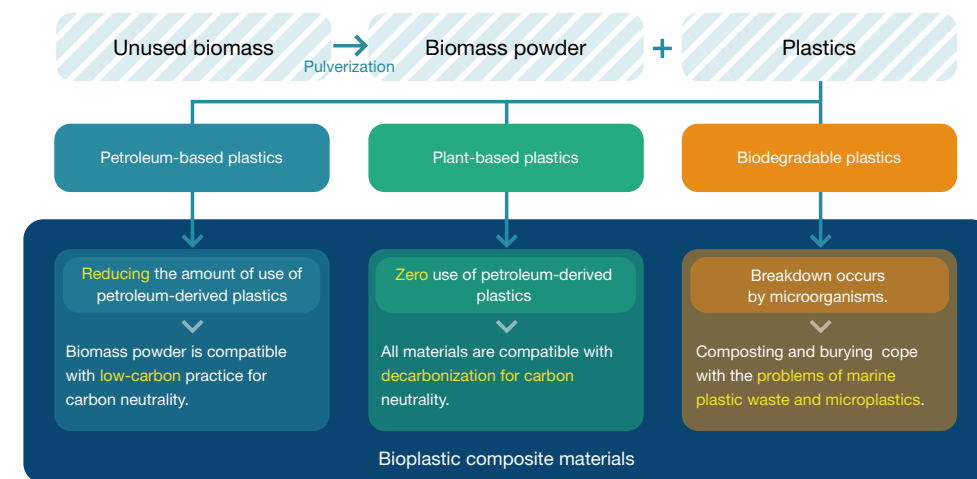
These activities have already started.

(Three case examples)

Case 1

Use of bioplastic composite materials for independence from petroleum resources

As a substitute for petroleum-based plastics, they develop bioplastic composite materials where biomass ingredients are used. Reduction of CO₂ emissions during incineration and prevention of long-lasting plastic wastes in soil and the sea are targeted. (i-Compology)



Source: Prepared with reference to the evaluation results of the STI for SDGs award FY 2019 organized by JST, Excellent Practice Award for i-Compology

Source: Prepared with reference to "Forecasting the Consumption of Metals up to 2050", Kohmei Harada, Masanori Shimada and Kiyoshi Ijima (Journal of the Japan Institute of Metals and Materials Volume 71, Issue 10 (2007) pp. 831-839)

In order to reduce resources to dispose of



These activities have already started.

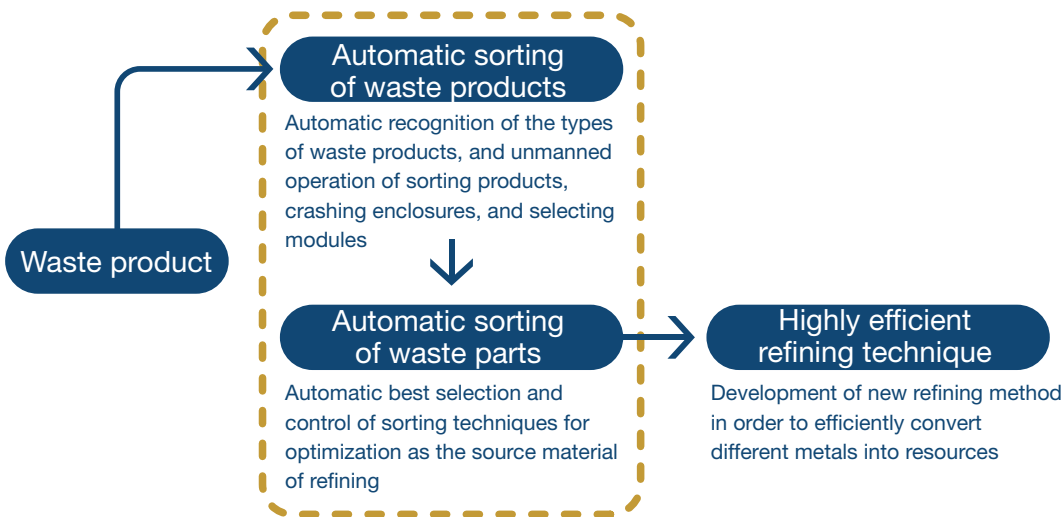
(Three case examples)

Case 2

Establishment of the Center for Developing Separation Technology (CEDEST) to convert waste products into resources

An Intensive Research Institute CEDEST was established within the AIST Tsukuba Center and a set of test devices of the automatic sorting system of metal resources contained in waste products was introduced. They promote development of innovative basic technology that allows low-cost, highly efficient recycling for effective use of metal resources, such as rare metals, contained in small electric home appliances and other waste products. (AIST, NEDO)

Technology developed at the intensive research institute, CEDEST



Source: Establishment of the Intensive Research Institute, Center for Developing Separation Technology (CEDEST), for effective use of urban mines, National Institute of Advanced Industrial Science and Technology (AIST)

Case 3

Detailed survey on composition of household refuse to aim at waste reduction through knowing the fact

They study domestic waste to aim at establishing product management systems that include proper recycling and disposal and model the material flows and consumer behavior. Household refuse of 400 to 500 families in Kyoto City were collected and examined closely by material and purpose to reduce waste. They make policy proposals for administrative bodies and give advice on waste reduction activities to manufacturing and distribution companies. (Kyoto University)

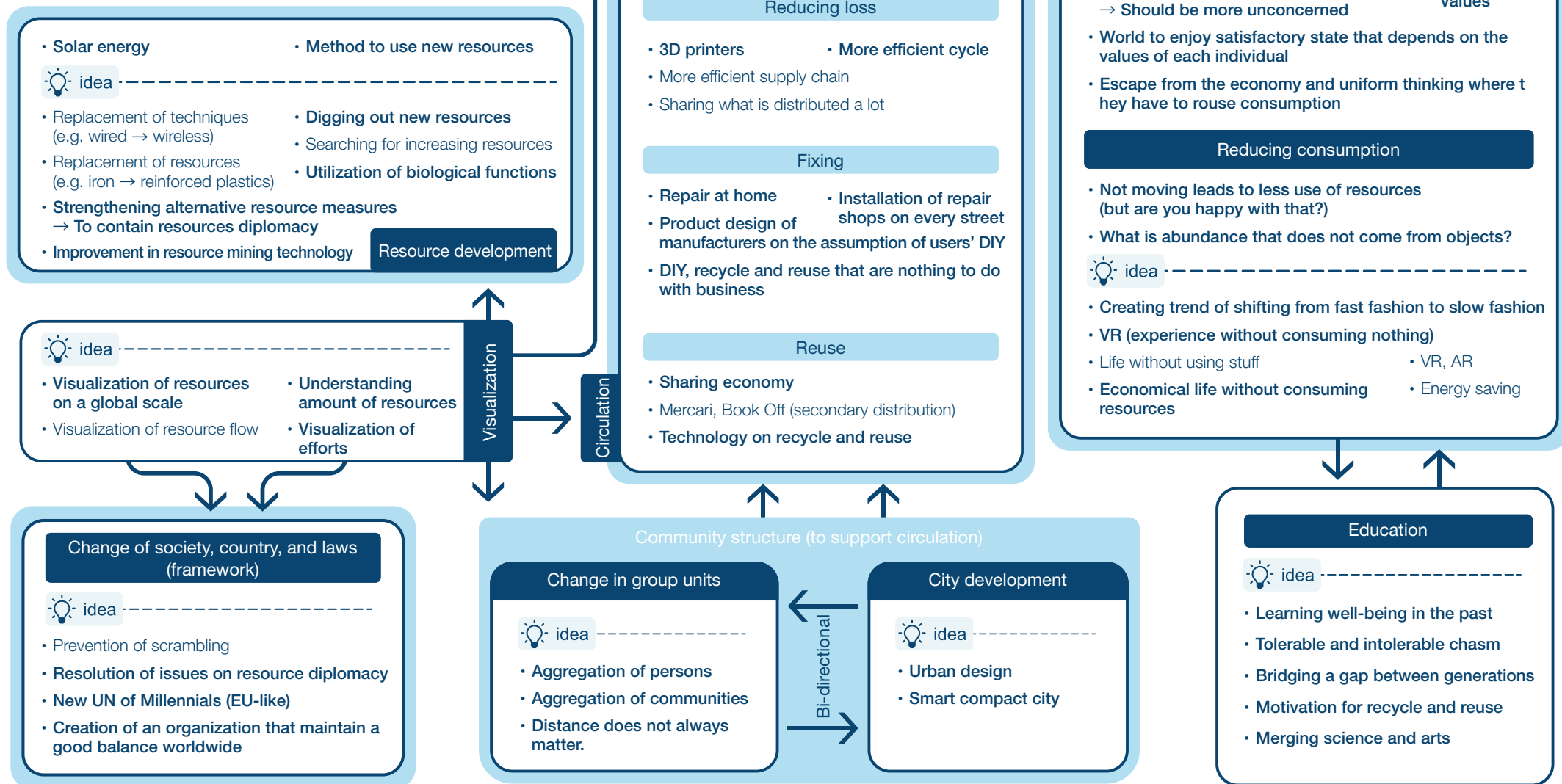


Source: Quoted from "Closely look at wastes and change the future - Consider the measures on wastes required in the era of the SDGs," Science Window



What can we do?

The following was discussed in the workshop held on Friday, February 7, 2020. The importance of the keyword, circulation, is noticed when viewing the outline.





Use resources based on the premise of circulation

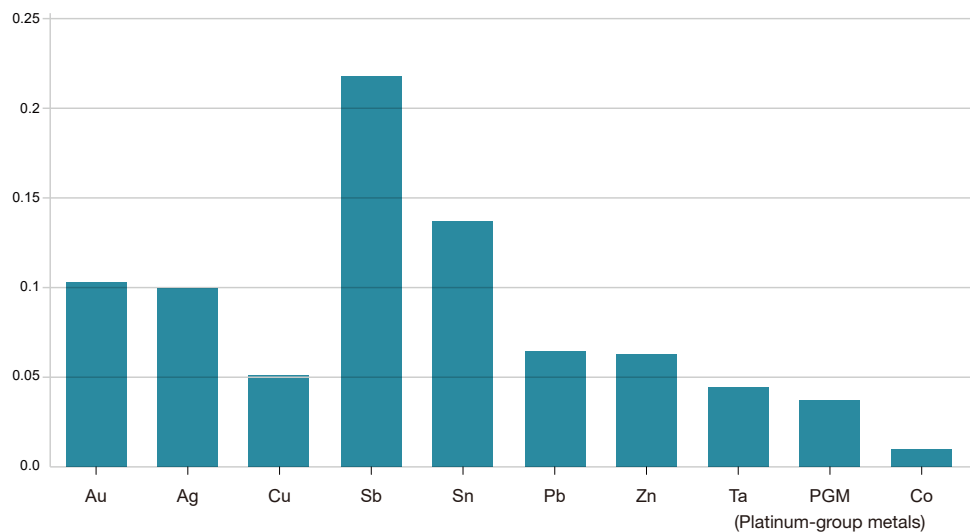
The workshop and following discussions made us find the keyword to solve metal resource issues, that is *circulation*. In particular, mineral resources are expected to face serious shortages in 2050. Possible countermeasures are saving, exploitation, and reuse. Since there are few mineral deposits in Japan,

reuse should be the focus. Specifically, we consider it effective that the urban mines of discarded industrial products are converted into resources again and recycled.

In fact, a certain amount of metals are left in the urban mines in Japan; the amounts of copper and lead correspond to around 5% of the

reserves of the entire world, and those of gold and silver correspond to around 10%. It is therefore possible to say that Japan is one of the richest countries in terms of resources if urban mines are counted.

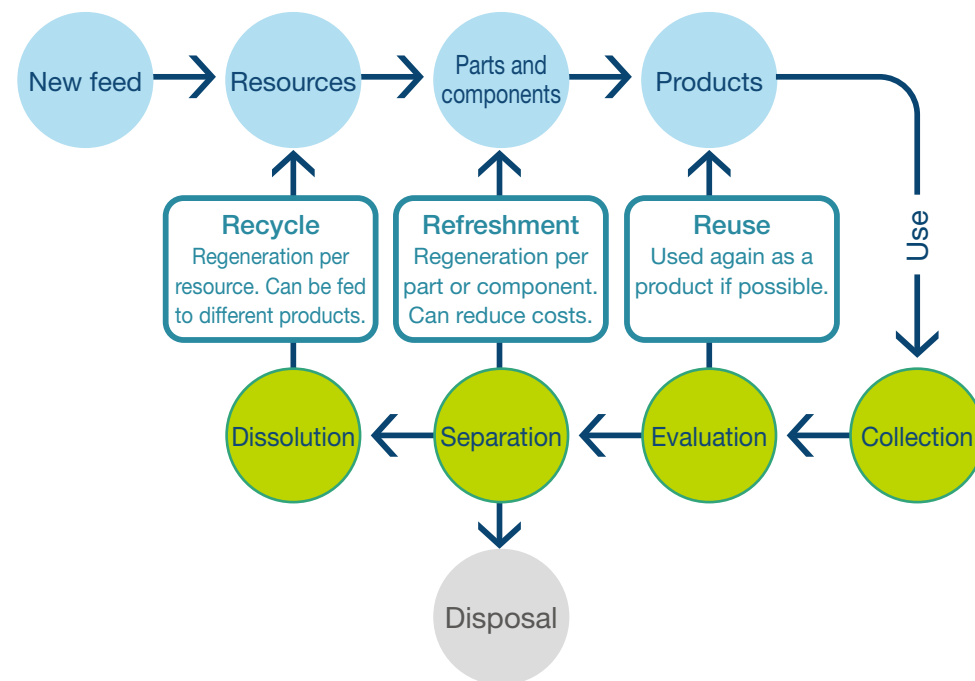
Accumulation in Japan/world's reserves



*Comparison with the data of 2017 on metal reserves in the world published by the United States Geological Survey (USGS)

Source: Prepared with reference to "Quantitative relationship between accumulation of urban mines in Japan and world's reserves in 2017," Sustainability Design Institute (SusDI)

Various recirculation cycle for the use of urban mines



Source: Prepared with reference to *For effective use of Urban Mines*, Mitsubishi Research Institute, Inc.

What picture of 2050 do you draw?

The following six future visions were produced through the workshop.



Mitigate uneven water distribution

Sharing the values to preserve sound water

- ◎ Water education at school and during occupational training
- ◎ Development of a video game and creation of PR videos (YouTube etc.)

Issues: Alignment with industry



Visualize food distribution and reduce loss.

Real-time matching of food

- ◎ The impact of food production on the environment is scored, and the supermarkets, producers and consumers are connected.
- ◎ Information platform linked with recipe websites

Issues: The system based on the idea of inherently good will not work. It might be better if each party can determine participation.



Make the idea of the resource cycle conventional wisdom.

Formation of sharing communities with the same values

- ◎ Wealthy life even under limited conditions
- ◎ Visualization and extension of successful case examples
- ◎ Application to similar cases
- ◎ Coordinators and persons who serve as a local hub are required.

Issues: Disconnection from the people outside of the community. Can we overcome the failures of sharing economy model cities in the past?

Actualization of water use trading

- ◎ Similar to CO₂ emission trading. The countries that consume a lot of water pay a fee to the world bank of water. The money is used as the funds to introduce artificial rainfall equipment to the areas of water shortages.

Stakeholders: United Nations, manufacturer of water supply equipment

Food teleportation

- ◎ Reuse of excess food. Decomposed to nutrients and cooked again.
- ◎ Every human has time of eating.
- ◎ Connection via space, building communities

Stakeholders: The entire supply chain, such as canned food manufacturers. Cookware manufacturers, restaurants, cooking schools

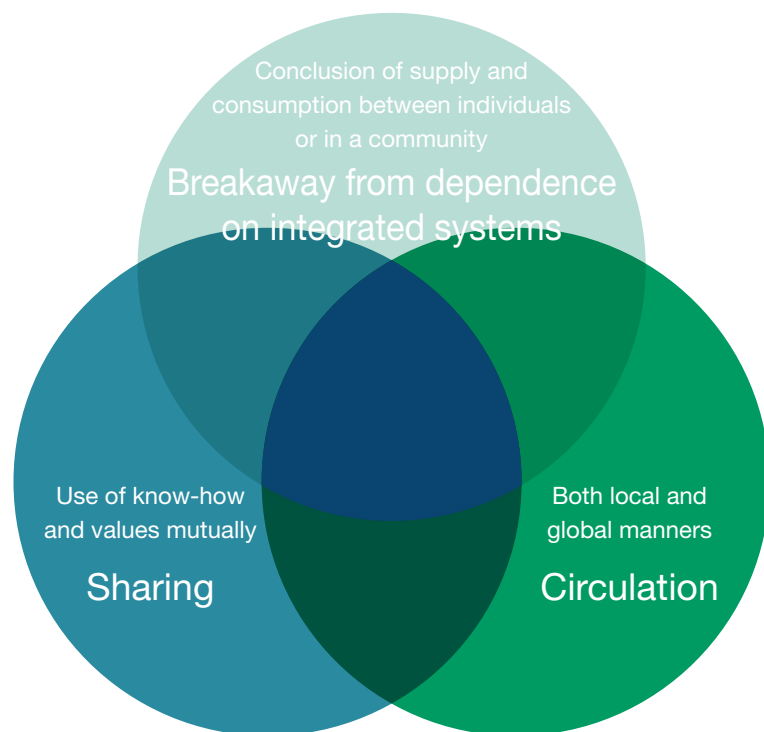
LESS is MORE

- ◎ Realization of a society of better-being with smaller resources
- ◎ Life chain management of resources + Digitalized materials = Ultimate recycle (almost zero waste)

Issues: Who lead the activity to achieve such a society?

What do water, food, and resources have in common?

Through the workshop, you see some of the factors common to the solutions to the issues on water, food, and mineral resources. From a certain standpoint, they are common particularly because these three are material resources.

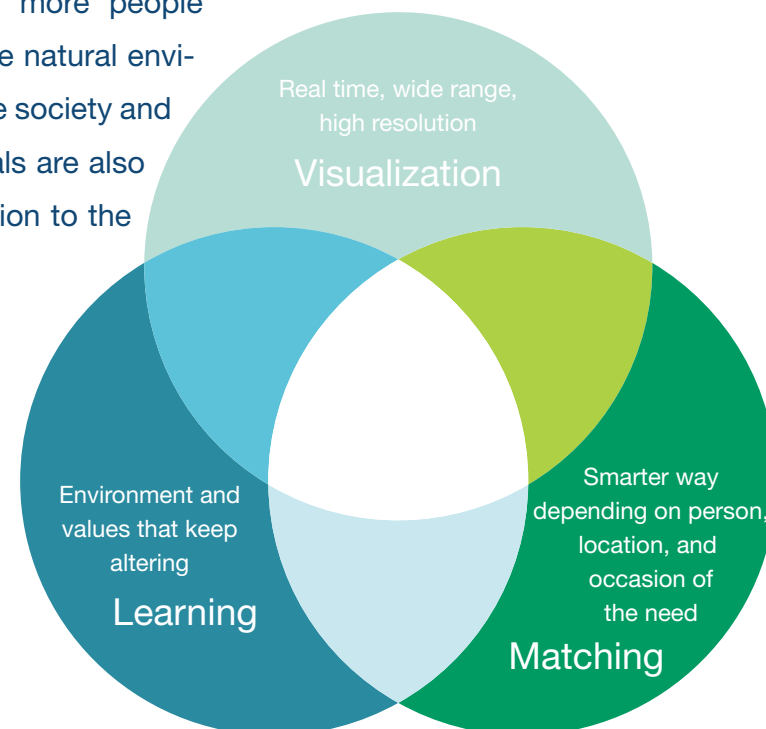


Values in common

Though the great growth of industry in the past led to a wealthy society, it has caused problems and is making them increasingly serious now. These values are different from traditional ones and should be required to solve them.

Means in common

In order to solve the issues on material resources throughout the world, it is necessary to visualize and be aware of the changing resources in real time. An appropriate matching of people and resources is enabled only after the necessity is fulfilled. Besides, if more people learn the changes in the natural environment and values, the society and the lifestyle of individuals are also changed, and the solution to the issues will come closer.



Issues not discussed in depth during the workshop

This workshop let us consider with many people how to make the world in 2050 sustainable. However, we never think that the debate and ideas so far has brought the optimum solution. It is natural that the inhabitants of the year of 2020 have extreme difficulty in imagining and discussing the values of 2050.

We also understand that there are many hurdles before realizing the ideas.

These topics had been listed before the workshop took place. You see there were a lot. And more subjects have been discussed in addition. However, we cannot believe that all issues were covered.



Issues on water in Japan

- Virtual water accompanied by importing food (We import as much virtual water as the domestic agricultural water of Japan.)
- Maintenance and rehabilitation of decrepit infrastructure under the condition of decreased population
- Flood control (Measures for abnormal weather etc.)

Countermeasure examples

- Highly efficient food supply
- Engineering development (Supply: Seawater desalination, fog collection; Consumption: Water-saving type devices; Recycle: Membrane separation, ozone treatment, etc.)
- Monitoring with AI and IoT, infrastructure maintenance by comprehensive management, etc.
- Use of green infrastructure (including so-called green dam)



Issues on food in Japan

- Great dependence on foreign countries (Calorie-based self-sufficiency rate is less than 40%.)
- Decreased, aged population of agricultural labor force
- Huge amount of food loss (6.5 million tons per year)

Countermeasure examples

- Suppress of demand (Life-style improvement, intake control by AI etc.)
- Minimization of food loss (Production and distribution control by AI and IoT, food banks, 3D food printers, etc.)
- More efficient food production, reduction of environmental burdens
- Smart agriculture (Sensing technology, use of AI and IoT)
- Biotechnology (Genetic engineering, genome editing)
- Agroecological agriculture (Use of potential of the ecosystem)
- Alternative food materials (Cultured meats, entomophagy, algal proteins) etc.



Issues on resources in Japan

- Almost 100% dependence on foreign countries for both base metals and rare metals
- Waste plastics are recycled at the rate of 84%. However, 56% of it account for thermal recycle (material recycling: 23%, chemical recycling: 4%). More than 40% of material-recycled plastics are exported overseas.

Countermeasure examples

- Promotion of resources cycle (Eco-conscious design, condition control with IoT, sharing, XaaS, etc.)
- Alternative materials (Abundant amount of resources, easy to recycle)
- New development of resources (Deep underground, ocean, outer space, etc.)
- Digitalization and sharing for quitting dependence on materials

Source: Quoted from 50th Anniversary Research, Mitsubishi Research Institute, Inc.

We want to go beyond the frameworks and take action on social issues

Nevertheless, we believe that our efforts in this workshop are worthwhile.

Our discussion and ideas might seem to be trivial or insufficient because they lack concreteness and viewpoints from experts and professionals in the actual fields of work. However, we really appreciate it if this document would be read by those who notice the absence of topics and concepts and have perspectives different from ours.

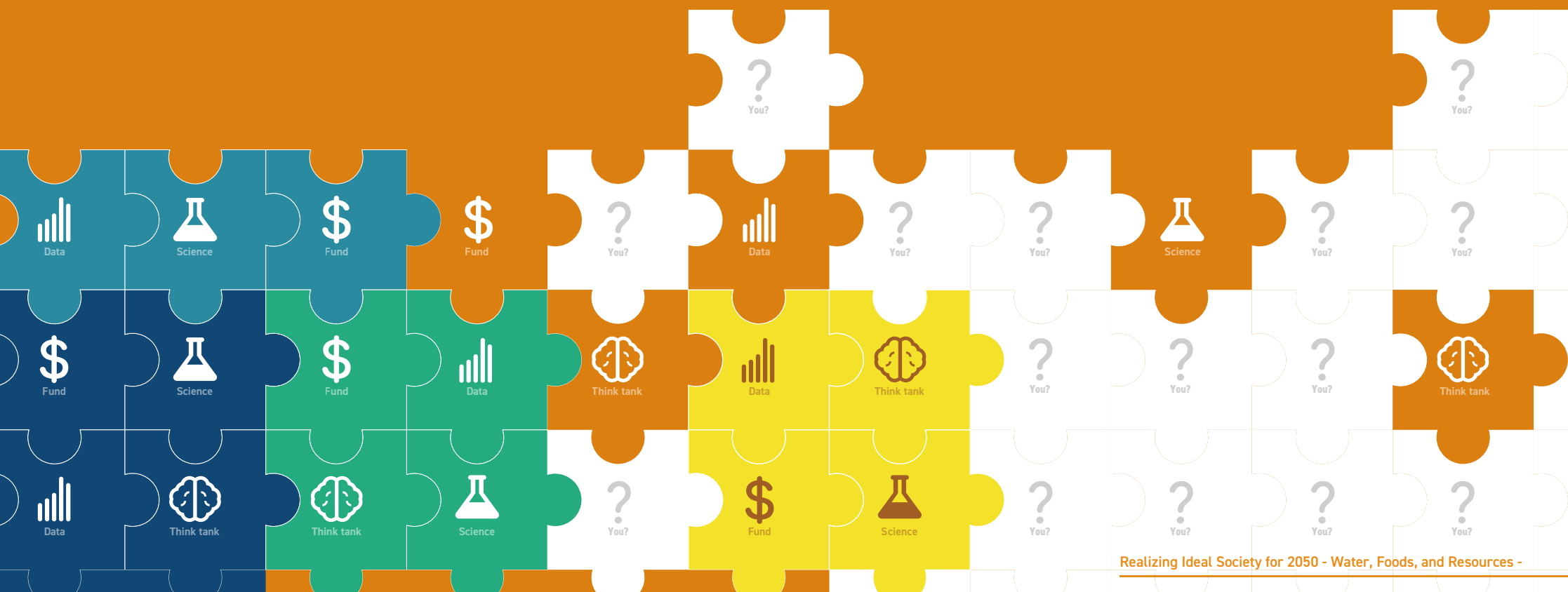
It is because of the necessity to combine many distinct areas of expertise for solving social issues in a complicated nexus.

We, CHANCE, do not seek an optimum solution within a framework but go beyond it, consider what we should do together with various stakeholders, and will take solid action on the social issues.

Resources and issues of CHANCE

The objective of CHANCE is to design the ideal future society by collecting knowledge from diverse players, and we are proceeding toward that goal. However, the domain of CHANCE does not spread evenly. For example, it is likely that the activities of individual entities, in other words, NPOs and citizen groups, and financial and political viewpoints are not covered by our limited ability.

On the other hand, we are proud of our notable resources that are helpful in clearing up social issues. More specifically, they refer to the think tanks and the connections to top-class scientists of each collaborator, the collected data and knowledge based on scientific evidence, the fund to push forward the research, and the business sector networks that involve major companies and entrepreneurs. If you are addressing a challenge that could be resolved with these resources, why don't we work together?



Resources and issues of CHANCE

What is effective in resolving social issues is not only just thinking but also taking concrete action with the use of the specialty of each person. CHANCE's valuable strength in science is to create new means even if it is not likely to lead to business.

Nothing is versatile, neither business nor science. We hope that at various places there occur activities beyond their respective frameworks, even including incidents outside of the Network of Networks of CHANCE.

The reason is that the activities for solving social issues not only expand the possibility of science but also bring good opportunities for businesspersons who want to do significant work. Let's stretch our conventional way of thinking to look across a wider area of the world as far as possible. What life do you desire for yourself in the future and the generation of your children to live? What do you have to do for it? Think and act for it.

How is the society that you want to create?

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Colophon



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