

Human-Human and Human-Nature Bonds: Keys to Self Reliance in Toyama's Resilience Strategy



WORLD BANK GROUP

City Partnership



TOYAMA

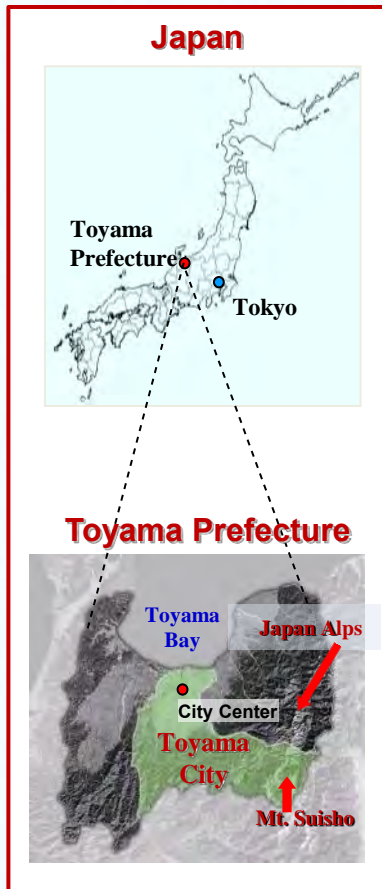
Rockefeller 100 Resilient Cities

Dr. Joseph Runzo-Inada

Chief Resilience Officer, City of Toyama



Location in Japan and Toyama Prefecture



Basic Facts

- ❖ Population: 422,000 people (40% of Toyama Prefecture)
- ❖ Area: 1,242 square km (30% of Toyama Prefecture)
- ❖ Topographical diversity: 44km (27miles) from sea level at Toyama Bay to 2,986m at Mt. Suisho
- ❖ 70% of the land is forested
- ❖ Abundant agricultural land
- ❖ Industries: pharmaceutical, high-tech, robotics, banking, machine tools, chemicals, electronic parts/ circuits
- ❖ Ranks first in Japan for home ownership at 77%
- ❖ Ranks first in Japan for percentage of women in the work force

Stages in Toyama's Resilience Modeling

July 2008 National Government of Japan designates Toyama an “Environmental Model City”

December 2011 National Government of Japan designates Toyama an “Environmental Future City”

2012 OECD recognizes Toyama as one of five cities with advanced “Compact City” policies

2014 Toyama is the only Japanese city selected for the UN Sustainable Energy for All program

December 2014 Toyama is the first Japanese city chosen for Rockefeller 100 Resilient Cities Initiative

May 2016 Toyama selected as the host city for the G7 Summit Environmental Ministers Meetings

July 2016 Toyama signs first non national entity MOU with the World Bank as one of the four Japanese cities chosen for a World Bank City Partnership



G7 Toyama Environment Ministers' Meeting

During the 2016 G7 Summit in Japan, Toyama hosted the G7 Environment Ministers' Meetings. Participating ministers: Japan, Italy, Canada, United States, Germany, France, United Kingdom, and EU.



The Toyama vision is to be a vibrant city of innovation and a tourism gateway, a model of resilience and environment-friendly living, where strong community bonds help citizens flourish, and the high quality of an active lifestyle for all its residents achieves a harmonious balance between traditional arts and modern technology and between economic prosperity and the inspiring natural surroundings of the pristine Northern Japan Alps.



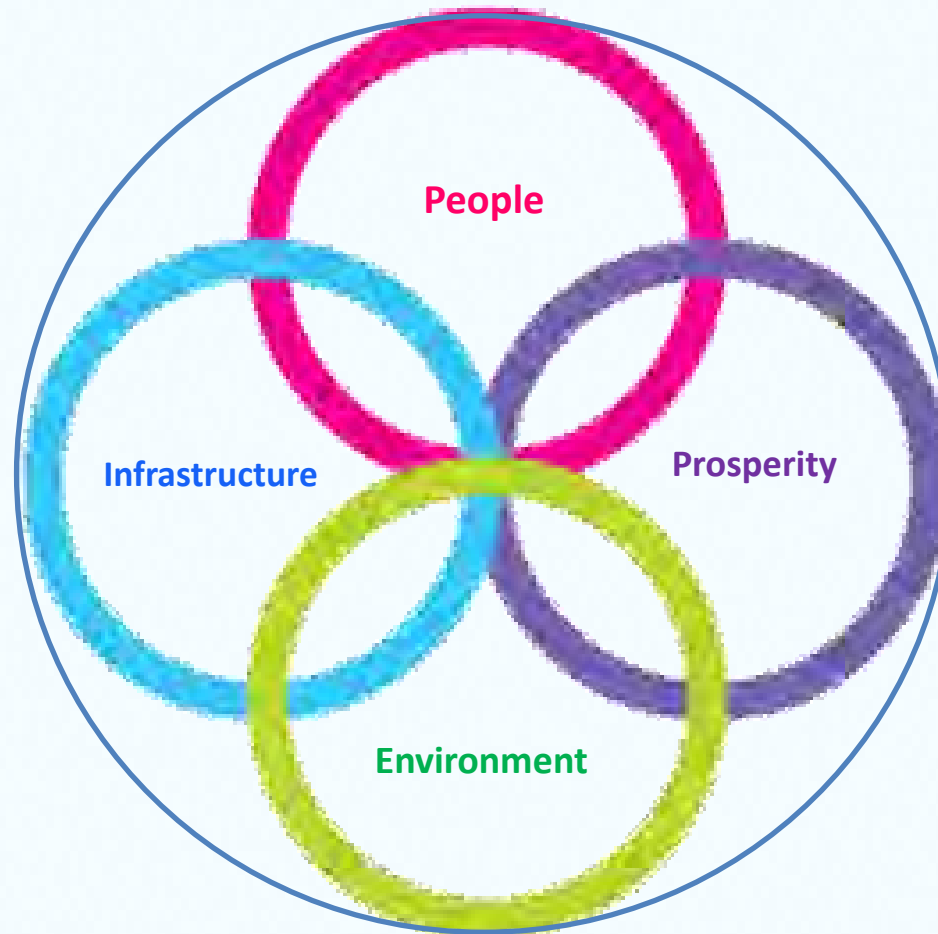
Toyama Vision 2050

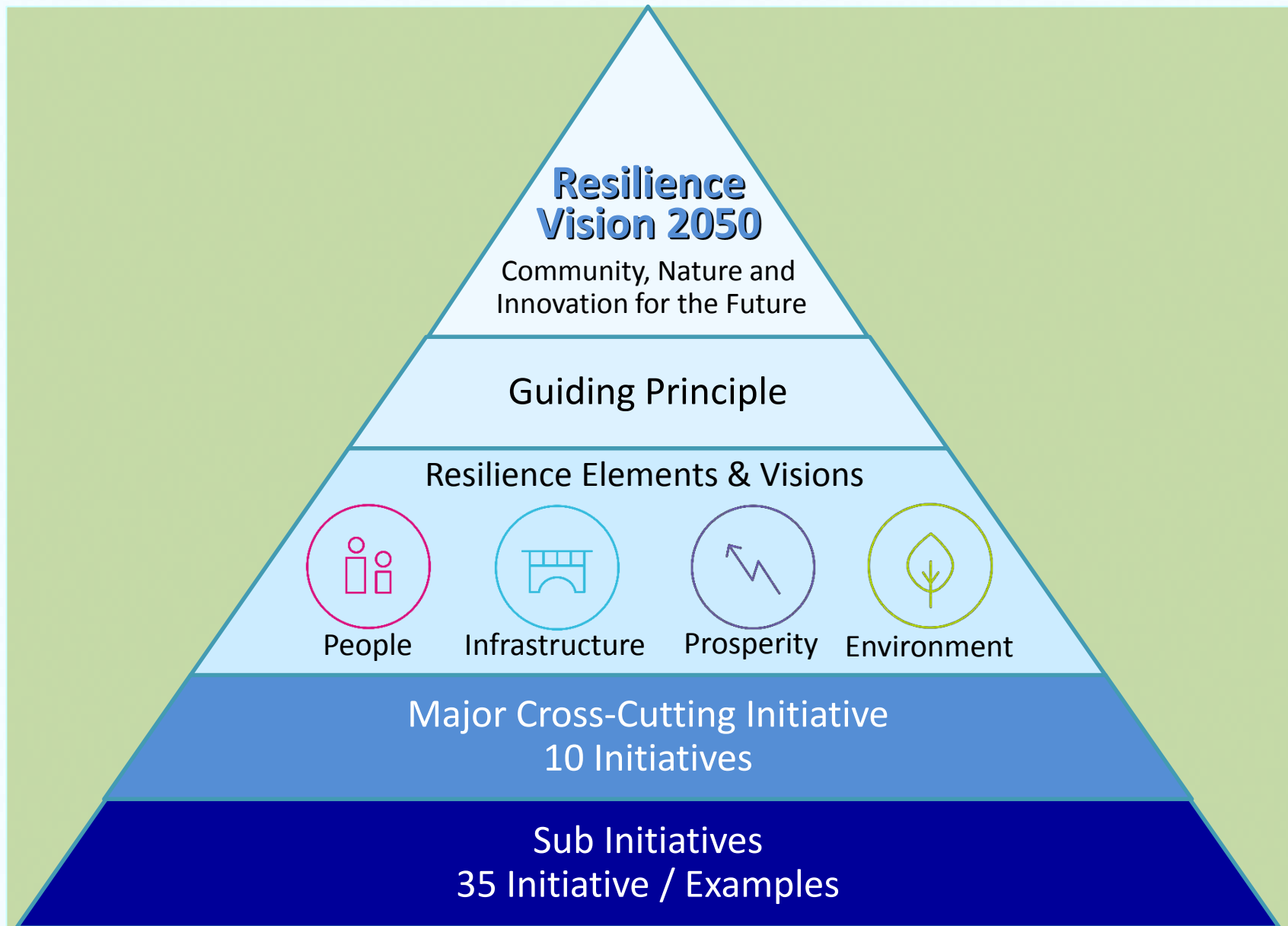
Live Toyama, Love Toyama:

Community, Nature and Innovation for the Future



TOYAMA





































The background image shows a vibrant green agricultural field with neat rows of leafy plants, likely basil, growing in a field. In the distance, a dense forest covers a hillside under a slightly overcast sky. A few houses are visible on the slope. A semi-transparent green box with white text is overlaid on the center of the image.

Resilient Environment

The Toyama Vision for the Environment is a harmonious balance between human health, animal health and the health of Toyama's bountiful nature. This comprises two aspects, each reflecting a different though complementary value and ethical stance: environmental management (human health) and environmental conservation (the health of nature and animals for their own sake). Working with international organizations like UNEP, NOWPAP, SEforALL, IUCN and IGES, Toyama will continue to vigorously support eco-friendly socio-economic practices, efficient waste management systems, green industries and long-range conservation plans.

10 Major Cross-Cutting Initiatives

	Initiatives	Elements			
1	Comprehensive Smart City Initiative				
2	Public Transportation				
3	Water / Waste / Energy / Management				
4	Disaster Preparation & Response				
5	Integration of City Center to Seacoast Area				
6	Rural Toyama & Agricultural Sustainability				
7	Business Investment				
8	Tourism				
9	Citizen Health, wellbeing & Participation				
10	Conservation & Environmental Education				

#3. Water / Waste / Energy Management

#6. Rural Toyama and Agricultural Sustainability

#9. Citizen Health, Wellbeing & Participation

#10. Conservation & Environmental Education

Goal

To provide robust, integrated clean solutions to Toyama's energy, water and waste management.

-- Our water, waste and energy management initiative will create an integrated approach to delivery water, energy and waste management services in Toyama. It will simultaneously support our future needs, address global environmental challenges, and stimulate economic diversification into new areas of the green circular economy.

Sub Initiatives

- 3.A Revise comprehensive Environment (Waste/Water/Energy Management) Plan
- 3.B Develop the city's waste to energy industry

3.A Revise comprehensive Environment (Waste/Water/Energy Management) Plan

Revise the plan which integrates ongoing actions on energy, water and waste management within a single plan. We will strengthen our approach by focusing on local production of renewable energy including micro hydroelectric facilities and solar power generation.

Resilience Value: This will help to ensure effective provision of critical infrastructure and services, particularly securing our future waste management, water supply and energy provisions. It will promote economic prosperity through the development of new industries and business sectors.

Micro hydroelectric power generation units intended for utilization on flowing water, like agricultural canals, which have only a modest gradient.

Josaikoen micro hydroelectric power plant



- Power generation: 9.9 kW
- Total annual electric power generation: 84,300 kWh

Higashimachi-Higashishinmachi Civic Hall micro hydroelectric power plant



- Power generation: 88 kW
- Total annual electric power generation: 689,200 kWh

We are developing a self-supporting farming village model which utilizes small scale hydroelectric installations along agricultural water canals. The electricity which is generated will power agricultural EVs, and the surplus power sold for income.

Micro Hydroelectric Station on a Canal



Bali Island Rice Fields in the Tabanan Region



Assets

Abundant water facilities
Network of canals

Problems

Access to electricity

Declining agriculture

Technological Solutions

Micro hydroelectric along agricultural canals

Advanced farming technologies



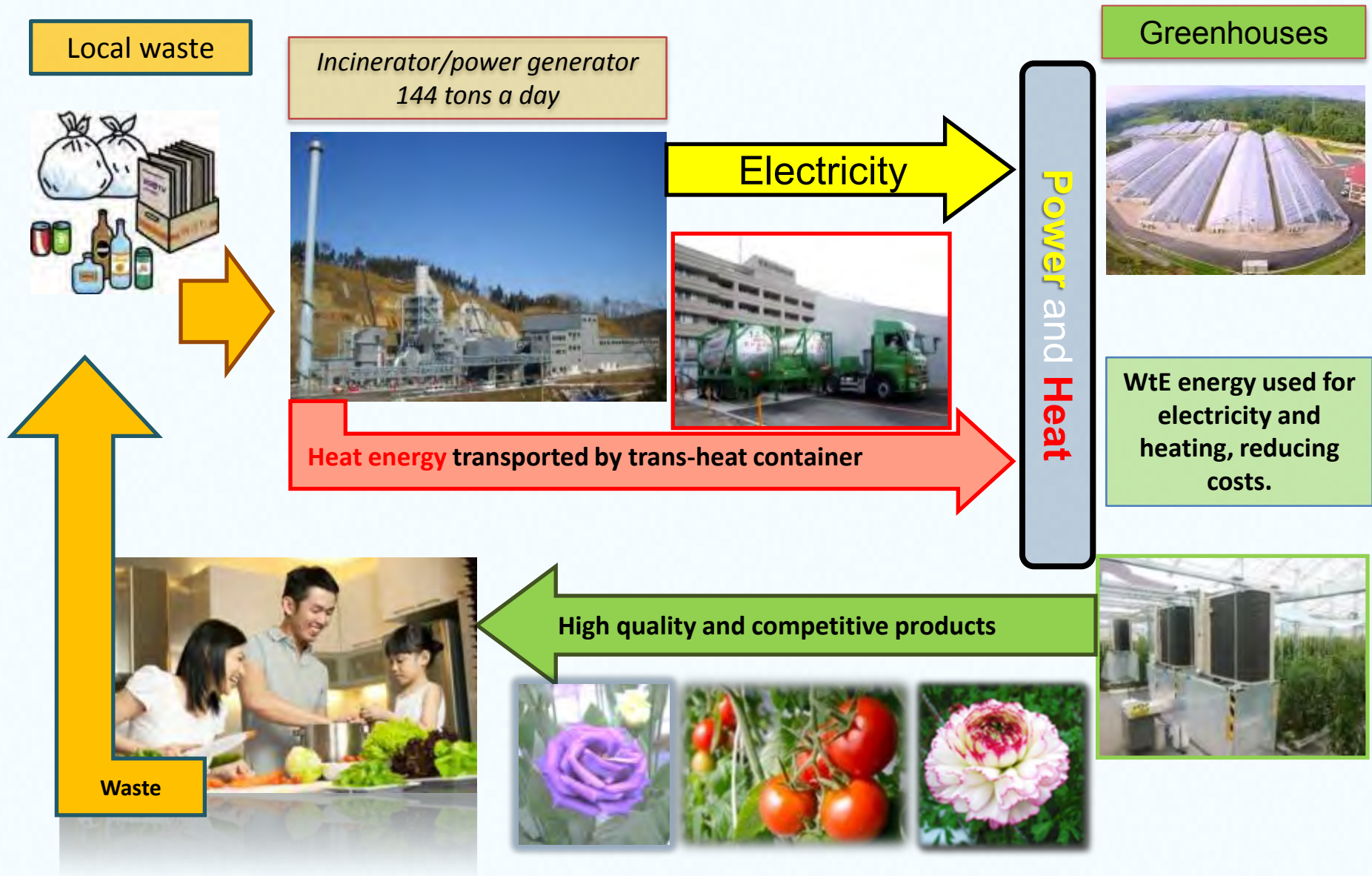
Mayor Mori signing a micro hydroelectric agreement in 2014 with the Tabanan region of Bali

3.B Develop the city's waste to energy industry

Develop the waste-to-energy (WtE) market, both within the city and externally, and promote recycling and WtE within the city. This will build on Toyama's current capacity including Eco-Town recycling industrial park, several private waste-to-energy plants, and the use of waste energy to cultivate agricultural crops.

Resilience Value: This will help to ensure effective provision of critical infrastructure and services, particularly securing our future waste management and energy provisions. It will promote economic prosperity through the development of new industries and business sectors.

Kankyo Seibi WtE Greenhouse Horticulture Project



With 70% of the municipal area woodlands, Toyama City is promoting the use of wood pellets which are manufactured from timber derived forest preservation thinning. These pellets are used as fuel for stoves and boilers.



Timber from forest thinning



Wood pellet manufacturing



Wood pellets



Pellet stoves

Goal

To protect and enhance the rural areas which are vital for our regional economy, our identity, and environmental quality.

-- Our rural sustainability initiatives will ensure Toyama's agricultural and traditional rural landscapes are maintained, supporting viable businesses and a good quality of life for rural residents.

Sub Initiatives

- 6.A Conserve our rural landscape and forests
- 6.B Promote high-value agricultural products
- 6.C Expand agricultural skills
- 6.D Introduce electric vehicles at rural city facilities

6.A Conserve our rural landscape and forests

Following the national reorganization program to consolidate Japan's rural and urban areas, Toyama's agricultural landscapes are a key feature of the city. We will celebrate and maintain the rural landscapes through establishment of a volunteer forest management project, conservation of the traditional rice terrace landscape, and we will promote regional forestry products as a characteristic of Toyama.

Resilience Value : This will contribute to Toyama's environmental protection and preserve the economic productivity of our forested area. It will promote community engagement in landscape protection and support citizen self realization.

Conservation of the Environment in Rural Communities



National Government Support : Direct payment for mountain areas (81 villages)

Toyama City Support : Terrace Maintenance

1. Citizen-linked support

Support activities related to maintenance and management of agricultural lands in cooperation with urban residents (22 villages)

2. Summer Flood Management

Subsidy for measures related to abandoned cultivation through management of paddy fields in the summer (Approx. 7.2 h)

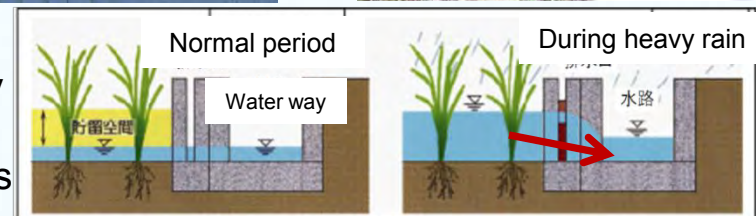
- River channel improvements take a long time so it is important to quickly develop “rainwater adjustment ponds” to control the inflow volume of rainwater into rivers.
- Various rainwater catchment methods are adopted to fit local conditions.



Storage at school rainwater ground gutters



Storage in paddy fields and agricultural canals



Underground rainwater storage facility



Aboveground storage facility

6.B Promote high-value agricultural products

With our farming communities, we will promote sustainable agriculture by identifying and promoting important medicinal and health benefit plants, supporting farmers to expand the planting area to increase productivity, and add new commercial value to medicinal plant products. We will promote sharing of farm machinery to reduce agricultural costs, and encourage the younger generation to develop low cost, high value agricultural businesses.

Resilience Value: Promotion of business efficiencies and diversification into high value agricultural products will improve economic resilience of the agriculture sector.

The National Economic Revitalization plan includes policies for developing agriculture as a ‘sixth industry’ where farmers increase the value of agricultural products by also processing and marketing them and engaging in agri-tourism.

1. Toyama facilitates re-cultivating abandoned farm land within the city limits for large scale farming of egoma perilla.
2. A Toyama company is developing a factory to produce 92 million egoma soft capsules annually designed to prevent oxidization of the fragile oil.



“Fish of the Field” Egoma Perilla

Because egoma perilla, a member of mint family used in traditional Chinese and Japanese medicine, is rich in omega-3 fatty acids, it is sometimes called the “fish of the fields”.

6.C Expand agricultural skills

We will expand agricultural skills and nurture new farmers by providing agricultural training to increase the employment opportunities in agriculture. We will provide opportunities for children from an early age to learn agricultural skills and the importance of this industry in protecting nature.

Resilience Value : Promotion of sustainable agriculture skills and education will attract new people into the industry, helping to maintain the economic robustness of this sector and preserve the environment.

Toyama City established the “**Rakuno Gakuen**” to support farmers and people who are not yet farmers but have interests in agriculture.

Learning Farming Skills

Farming challenge course

People who are interested in farming or considering complex farming can develop farming skill through practical activities.

Agricultural business course

Held once a year

Basic knowledge for starting an agricultural business

Farm training course

2 year training course

- Vegetables & Fruits
- Flowers & Rice

Home garden course

1 year course

Mainly about vegetable growing. The course is held in Sunday and Wednesday including a family lecture.

Challenges for Farmers

- Difficulties caused by ageing such as activity requiring working up high and cultivation of heavy vegetation
- No successor
- Increase of idle or abandoned land due to lack of manageability



Outcome: 704 graduates (as of the end of 2016)

The TOYAMA RAKUNO GAKUEN

RESILIENT



6.D Introduce electric vehicles at rural city facilities

Introduce electric vehicles for everyday use at rural city facilities particularly in areas where there are few gasoline stations. This will ensure the continuity of public service vehicles without the need for new gasoline stations, and also help to reduce the impact of vehicles on rural environments.

Resilience Value: Electric vehicles will provide reliable mobility in rural areas for city staff enabling their work in the area while also contributing to reduced CO2 emissions.

Resilience Strategy Release and EVs



Toyama's
Resilience
Strategy for 2050
released on July
13, 2017.

Nissan
Corporation
provides 30 EVs
for three years.

Photo left to right:
CRO Runzo-Inada,
100RC Associate
Director Sorkin,
Mayor Masashi
Mori



Goal

To ensure a good quality of life and self-realization for citizens of all ages, by enabling active participation in inclusive communities.

-- Our health, wellbeing and participation initiative includes actions to ensure a vibrant and inclusive city community, providing facilities to support every citizen's quality of life and self realization.

Sub Initiatives

- 9.A Upgrade community centers
- 9.B Implement intergenerational programs for community participation
- 9.C Implement intergenerational programs for local conservation
- 9.D Facilitate employment opportunities for elderly and disabled people
- 9.E Introduce initiatives to ensure working parents can continue to participate in the work place
- 9.F Promote cultural events
- 9.G Encourage an active lifestyle for the older generation

9.A Upgrade community centers

We will enhance the facilities at our community centers to provide expanded opportunities for lifelong education.

Resilience Value: This will strengthen opportunities to participate in community groups and to promote skills and learning for all age groups.

9.B Implement intergenerational programs for community participation

Introduce and promote initiatives that enable citizens to support others within their community. This will include services that match young families with citizens who can offer childcare, and vice versa, match people who can offer care to elderly people with dementia. We will also offer certifications for people who volunteer for the fire corps.

Resilience Value: This will improve social cohesion and strengthen community bonds. This enables everyone within the community to have a role in supporting each other from day to day, meaning they are better prepared to offer support during emergency situations.

9.C Implement intergenerational programs for local conservation

Introduce and promote environmental initiatives that embed an understanding of the natural environment and local history in the community. This will include tree planting programs for school children and development of community gardens in downtown parks for all age groups to cultivate together.

Resilience Value: This will encourage intergenerational communication and interaction which strengthens social cohesion while promoting an appreciation of the value of the natural environment.

Tree planting project with elementary school students “One Tree Per Child”

Based on the 2016 G7 Environment Ministers' meetings in Toyama, the city's elementary school students will plant trees to help them learn how forests absorb CO2 and prevent global warming. Planting trees and creating a rich natural environment on their own will help children become aware of themselves as part of the environmental community.

Project period: From 2017 to 2022

Location: Yamada Fureai Park

Target: Elementary school students
(about 4,000 people)

Method: Plant one plantlet with 4 or 5 children

Number of trees planted: About 1,000 (1.09 ha)

⇒ Reduce about 4 tons of CO2 per year



Community gardens are developed in previously abandoned squares in the city center. These gardens offer opportunities for the elderly to remain active, for intergenerational interactions and help bring nature into the city center, revitalizing the city center.



Before development

Initial Number of gardens: 3 areas

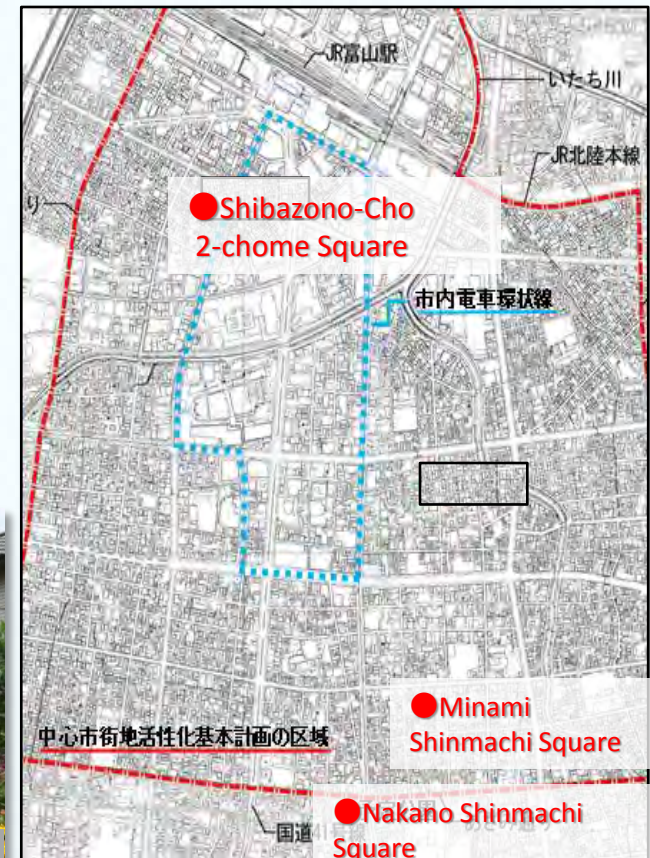
Size: 50 sq. meters per area



After development



After development



Location of Gardens

9.D Facilitate employment opportunities for elderly and disabled people

Create a human resources bank to facilitate employment of senior citizens and entrepreneurs in Toyama's businesses. Identify opportunities to develop employment opportunities for disabled people. This will encourage participation in the city economy.

Resilience Value: This will support access to the workplace for elderly and disabled people, allowing them to access sustainable livelihoods and participate in the economic life of the city. This will improve citizen well-being and reduce inequality.

9.E Introduce initiatives to ensure working parents can continue to participate in the workplace

Offer programs to support working parents through the provision of childcare facilities for sick or recovering children, and offer financial support for divorced individuals. Introduce workplace equality programs to enable working parents to continue in their professional development while fulfilling their family commitments.

Resilience Value: This will support workplace equality and families through sickness and major life events, improving well-being, strengthening familial bonds and enabling more citizens to enter the workforce.

9.F Promote cultural events

Promote cultural exhibitions, citizen art education and performances to enhance the city's active cultural and artistic life, promote social cohesion and celebrate Toyama's unique history and identity.

Resilience Value: This will enhance the quality of life and self-realization for citizens of all ages, and provide creative activities for all, revitalizing communities and promoting social cohesion.

9.G Encourage an active lifestyle for the older generation

Promote mobility and active lifestyles for the elderly by holding walking events where leaders convene group walks in the downtown. We will also aim to measure the movement of the older generation through the use of GPS devices, and use this data to upgrade the city's transport and health services.

Resilience Value: This will increase the mobility of the older generation in the city, increasing the health of citizens which can decrease medical costs, increase social integration and contribute to a lively downtown.

Goal

To preserve nature for future generations and conserve nature and accessibility to nature for citizen's self realization and resilience.

--We will conserve our natural environment as an essential part of Toyama citizens' sense of self and source of vitality, which promotes a positive outlook on life by honoring, protecting and increasing the accessibility of nature.

Sub Initiatives

- 10.A Host an international summit on the marine environment
- 10.B Promote "3R" project (Reduce Reuse Recycle)
- 10.C Increase environmental education at ECO Town

10.A Host an international summit on the marine environment

Well balanced development and protection of nature is essential for environmental protection and sustainable economic activity in our natural areas. The city will work with NGOs and IGOs such as UNEP, NOWPAP, ICLEI, JICA, and IGES. UNEP and NOWPAP are planning to hold a summit on the marine environment in cooperation with the National and local Governments, and the city in the summer of 2018.

Resilience Value: This will contribute to the conservation of biodiversity in the Toyama area and the preservation of natural supportive functions of our environment. This provides a buffer against environmental shocks and stresses and strengthens the resilient spirit of Toyama's citizens.

10.B Promote "3R" project (Reduce Reuse Recycle)

Developing a "3R Promotion School" for children to learn about the environment in order to raise interest in waste reduction and recycling from early childhood and school age.

Resilience Value: Contribute to citizens' awareness of conservation and environmental protection.

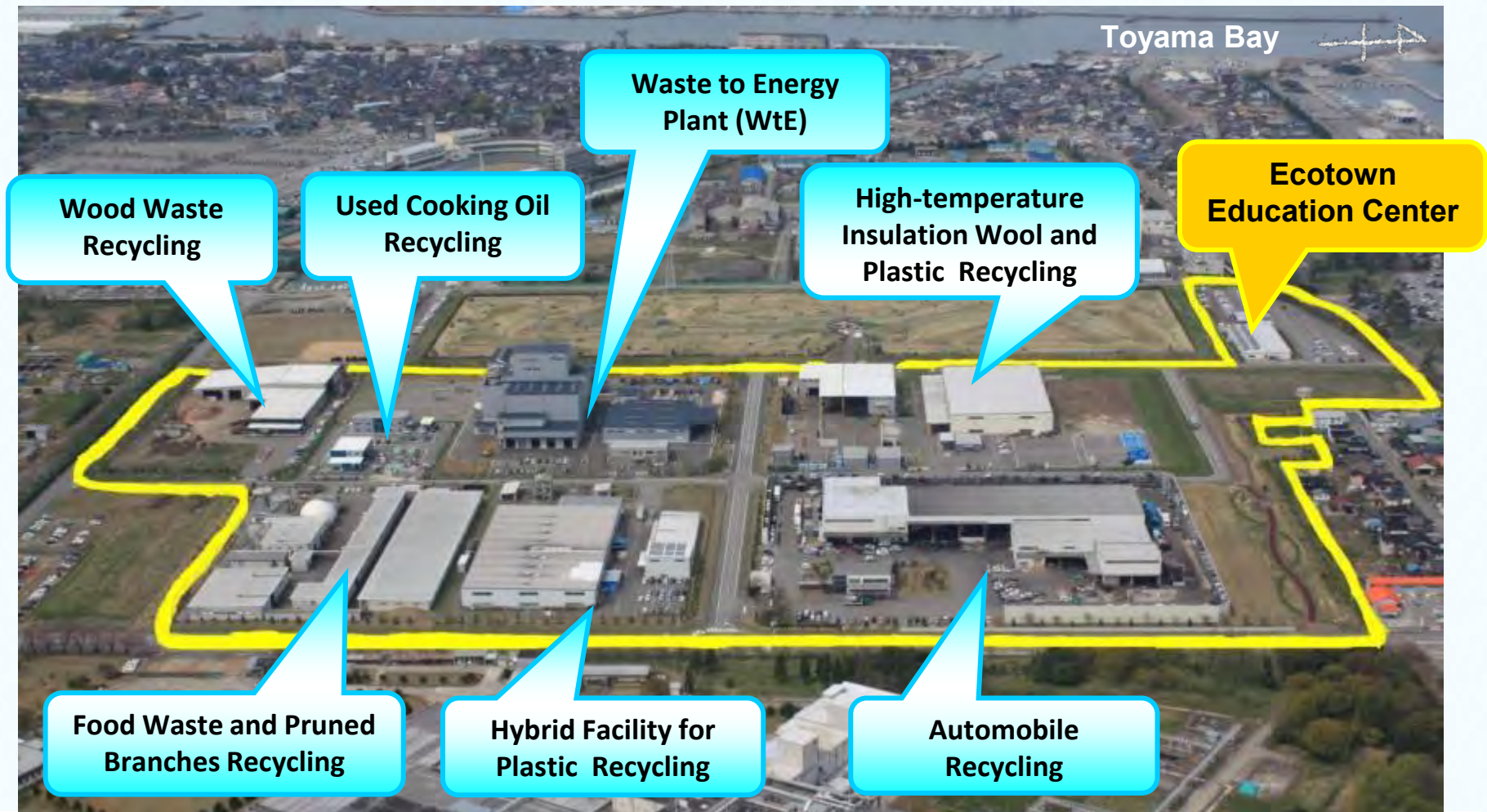
10.C Increase environmental education at ECO Town

Provide opportunities for holistic environmental education at EcoTown - Toyama's industrial park where "waste" is turned into usable products. An extensive waste recycling education center increases citizen awareness of the methods and importance of waste recycling. Encourage including other topics related to environment and conservation.

Resilience Value: Enhance citizens' understanding of modern environmental and conservation best practices.

Waste Recycling – Eco-town

With city incentives, seven companies now turn putative “waste” into usable products at the Eco-Town Industrial Park, started in 2002. An extensive waste recycling education center increases citizen awareness of the methods and importance of waste recycling.



I. Taking the Moral Point of View

1. Self Realization of Oneself and of Others
2. Relationship Morality
3. Human-Human bonds
4. Human-Nature Bonds

II. Seeing the City Organically

1. Urban and Rural Reciprocal Relationships
2. Environmental Management & Conservation

III. Self Reliance and a City's Resilient Heart