Basic Concept of Kuroshio-cho's Second Disaster Management Plan for Nankai Earthquakes and Tsunami

January 31, 2013 Kuroshio-cho

Introduction:

Since the Hakuho Earthquake in ancient times, our hometown of Kuroshio-cho has been hit by massive Nankai earthquakes every 100 to 150 years. We are inevitably forced to live with such large-scale natural disasters.

Against such a backdrop, in 2012 the Cabinet Office and Kochi Prefectural government released a report containing estimates of seismic intensity distribution and tsunami heights induced in the event of a massive earthquake in the Nankai Trough.

According to the report, an earthquake with a maximum seismic intensity of 7 could hit the region and the maximum height of the resultant tsunami could be as high as 34 m, which is the most severe in Japan. Though Kuroshio-cho has carefully reviewed the disaster management plan and preparedness projects since the Off the Pacific Coast of Tohoku Earthquake, which occurred in March 2011, the town needed to face this harsh reality and perform further review.

Needless to say, the fundamental mission of Kuroshio-cho is to protect residents' lives under any circumstances. We continue to make efforts to enrich our community and pass on our *furusato* (hometown), which we inherited from our ancestors, to the next generation. This fundamental policy will never change.

In order to do so, we resolutely face Nankai earthquakes and promote community building for the future in accordance with an earthquake disaster management plan that makes us Japan's best municipality in terms of coping with earthquakes and tsunami.

■ Philosophy of and Vision for Disaster Prevention

On March 31, 2012, the Japanese government released a report containing estimates of seismic intensity distribution and tsunami heights in the event of a massive earthquake in the Nankai Trough. This was such a devastating piece of news that many Kuroshio-cho residents began to feel helpless, saying that there was no way to escape from tsunami. A sense of crisis spread in the town suggesting that many people would give up attempting to escape from tsunami.

But nothing comes from giving up.

Instead, we should learn about the history of our town and of our ancestors' efforts to rebuild our hometown from the tremendous damage repeatedly caused by Nankai earthquakes. Our ancestors never gave up. At the same time, thinking about their struggles, we must have a firm understanding of the mechanisms of earthquakes and tsunami based on today's scientific knowledge. What is most important is to complete implementation of countermeasures against Nankai earthquakes so that there are no victims, which is a responsibility for us living in the present.

Do not give up. Evacuate quickly to a safer place when you experience tremors.

Kuroshio-cho's Nankai earthquake disaster management plan is to be developed based on the basic principle that no residents will give up attempting to escape from tsunami.
In order to realize this principle, we have defined the following guidelines to promote the plan.

○ 15 guidelines for realizing "no victims" in the town, which could be hit by tsunami with a maximum height of 34 m

(Education and enlightenment on disaster prevention)

1. In the Off the Pacific Coast of Tohoku Earthquake, tsunami took the most lives. The lesson is to evacuate quickly to a safer place when you feel tremors. Education, enlightenment, and training activities will be thoroughly implemented to ensure each person does his/her best to evacuate.

(Concept and development of evacuation sites)

2. In developing evacuation shelters, areas not inundated based on the prediction of tsunami inundation induced in the event of a massive earthquake in the Nankai Trough, which was published by Kochi Prefecture on December 10, 2012, are developed as evacuation shelters with Safety Level A. Evacuation sites at an altitude of 20 m or higher in the predicted inundation area are designated as Safety Level B and developed as temporary evacuation shelters. Under the long-term plan, however, all evacuation shelters shall be Safety Level A.

(Evacuation by car)

3. In principle, we assume that residents evacuate on foot. In order to ensure evacuation of all residents, however, we should not dismiss the possibility of evacuation by car and also promote related measures on that assumption. We promote the development of main evacuation routes which can be used safely, particularly in areas where evacuation to higher ground is difficult.

(Core public facilities)

4. We anticipate that we may not be able to receive sufficient support from outside the town immediately after a massive Nankai Trough earthquake occurs. In order to make the utmost efforts to protect residents' lives in such a situation, it is important to ensure proper functioning of the chain of administrative command. Accordingly, core public facilities (the main town government building, Kuroshio Fire Station, and Kuroshio-cho Health Center) will be built outside the Level 2 tsunami inundation area.

(Nursery and school facilities)

5. Safety Level A evacuation shelters are developed for nursery and school facilities in the short-term plan. We plan to make conducting scheduled evacuation drills obligatory. Under the mid- and long-term plan, we aim to develop nursery and school facilities outside the Level 2 tsunami inundation areas as soon as possible.

(Construction of safe residential areas)

6. For housing for which it is difficult to secure safety from Level 2 tsunami, the long-term plan has been determined as much as possible in consideration of residents' opinions to construct new residential areas on higher ground or the hilly and mountainous area outside the inundation area in a phased manner. As there are many buildings containing town-provided housing which do not meet the earthquake resistance standard, we plan to relocate them to higher ground during an early stage.

(Development of a seawall and levee)

7. We strongly urge the national and prefectural governments to develop a coastal seawall and levee for the river flowing in the tsunami runup area, which can prevent Level 1 tsunami and delay inundation by Level 2 tsunami by the maximum possible extent.

(Information distribution system)

8. We appeal to the national government to enhance the accuracy of its earthquake/tsunami detection system. At the same time, we aim to enhance the information distribution system, which is capable of issuing early notifications before a disaster and is resilient to disasters.

(Preparations for risk management)

9. We anticipate that we may not be able to receive sufficient support from outside of the town immediately after a massive Nankai Trough earthquake occurs. Therefore, we aim to prepare for risk management that enables us to support ourselves on our own for a week, as well as to strengthen our ability to accept disaster volunteers so that we can utilize outside support to enhance operations.

(Measures for isolated rural communities)

10. As a countermeasure against the isolation of communities in the hilly and mountainous areas, we are developing a communication environment for times of disaster (e.g., satellite cell phones) and promoting distributed deployment of stock supplies. In addition, we aim to promote cooperation with construction organizations in the town to ensure quick opening of community roads.

(Introduction of new disaster prevention technologies)

11. We do not ignore any information on evacuation methods, including disaster prevention facilities and functions using new technologies (e.g., underground shelters), and we investigate measures with various options for evacuation to the maximum possible extent.

(Strengthening of functions of voluntary disaster prevention organizations)

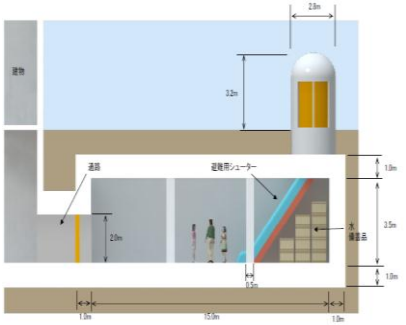
12. What we can depend on most in the event of a disaster are our families and people in the neighborhood. We encourage voluntary disaster prevention organizations to practice "*tonarigumi* (neighborhood association) for the disaster prevention movement" in order to develop a community where communication among residents in daily life is valued.

(Town employee assignment system to each district for disaster countermeasures)

13. Disaster countermeasures are the most prioritized issue for general administration among all tasks of all town government employees. Therefore, each town employee is positioned to serve as a special staff member in charge of disaster prevention in his or her assigned area. Employees are assigned to 14 districts governed by volunteer fire corps to promote practical fine-tuned measures in cooperation with local residents.

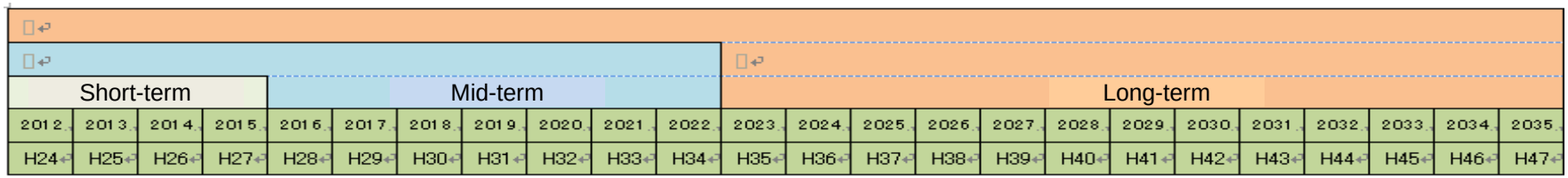
(Measures for earthquake tremors)

14. Approx. 96% of Kuroshio-cho is assumed to be hit by an earthquake with a seismic intensity of 6 upper or higher. Approximately 48% of the housing in the town is earthquake-resistant. Irrespective of whether the area is a tsunami inundation area or not, town-wide earthquake resistant measures are promoted.



(Target Year)

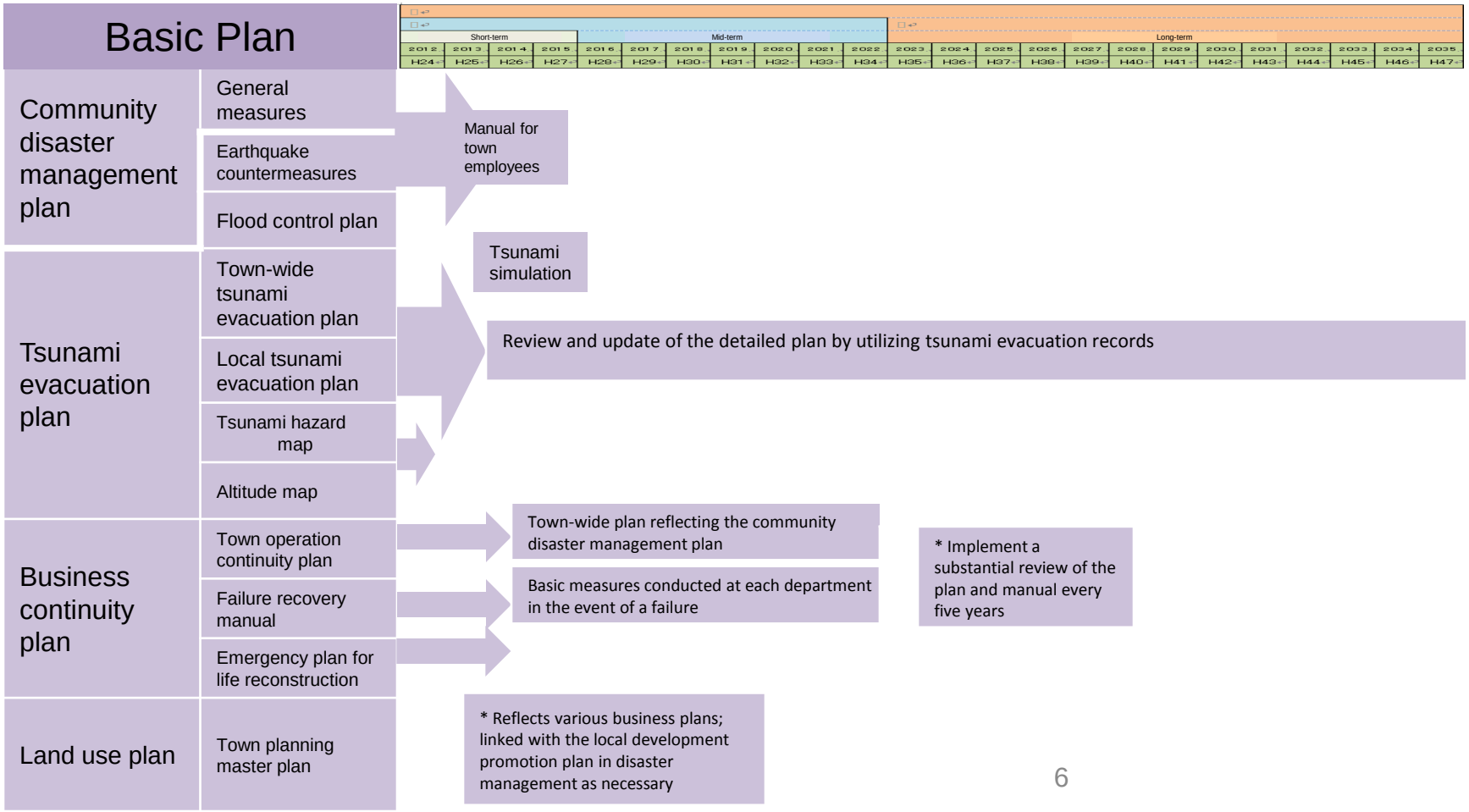
15. The Nankai earthquake disaster management plan is an action plan leading to specific measures and projects. Based on the basic concept of Kuroshio-cho's Second Disaster Management Plan for Nankai Earthquakes and Tsunami, "short-term" refers to 2012–2015, "mid-term" to 2012–2022, and "long-term" to 2012–2035. The target year of the plan specified herein is 2035 (24 years).



■Development of a 1,000-year Sustainable Community

The concept of the First Kuroshio-cho Comprehensive Promotion Plan is the development of a 1,000-year sustainable town.
We are, however, unable to accomplish such a goal without thorough preparation for massive earthquakes in the Nankai Trough.

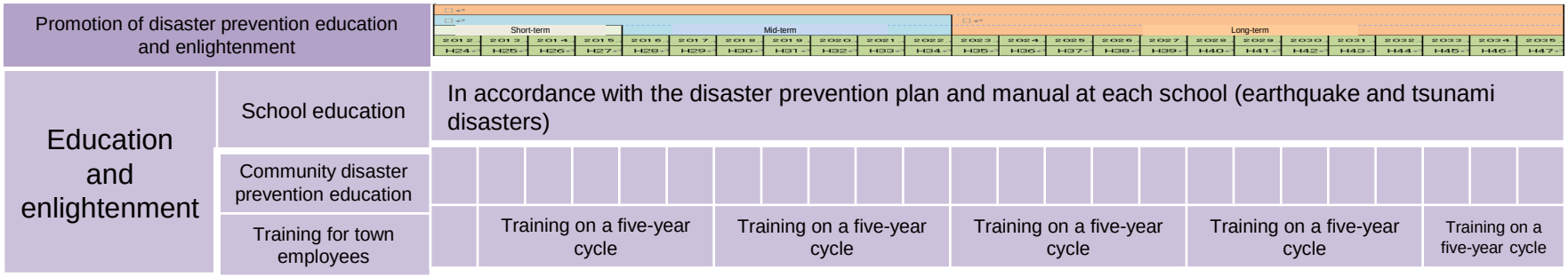
Knowing that we have a long and hard way to go, we set target years for achieving the following policies before the next Nankai earthquake hits, and we are addressing the issues with concerted efforts featuring public-private sector cooperation.



Enhancement of residents' evacuation awareness (No giving up)

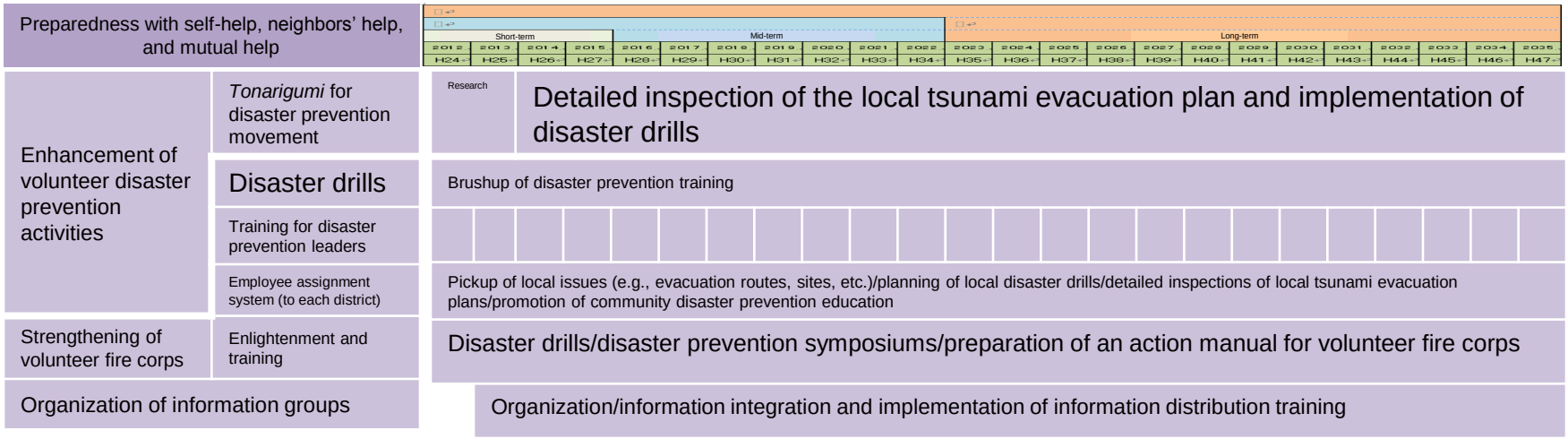
- In the Off the Pacific Coast of Tohoku Earthquake, tsunami took the most lives. The lesson is to evacuate quickly to a safer place when you feel tremors. Education, enlightenment, and training activities will be thoroughly implemented to ensure each person does his/her best to evacuate.

In addition, strengthening town employees' risk management competency is an issue directly related to the fundamental administrative mission—to protect residents' lives and assets. We implement training to strengthen risk management competency in all town government departments.



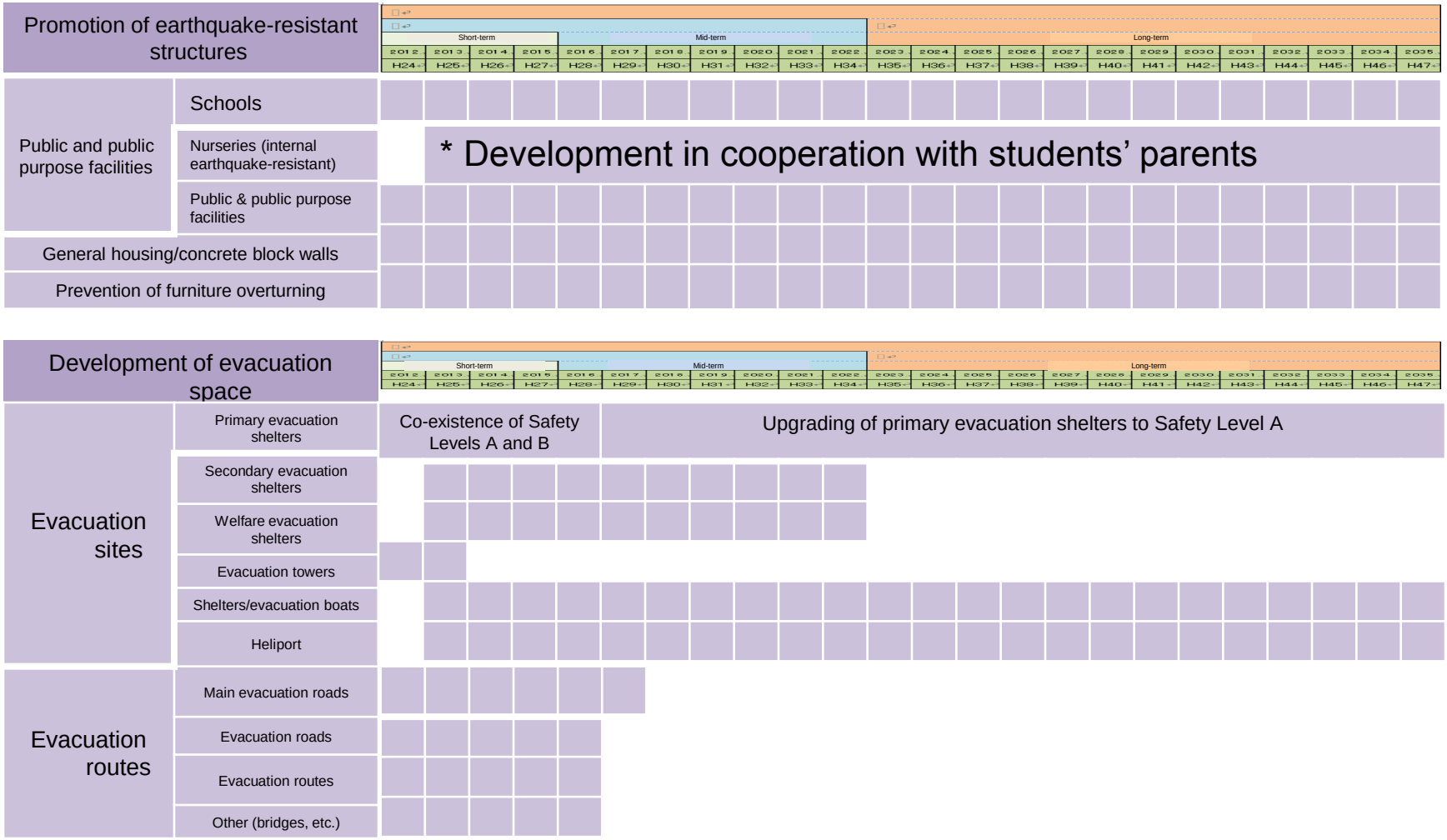
- Exclusively as a Nankai earthquake countermeasure, we have introduced the town employee assignment system (to each district), and we strengthen local disaster prevention organizations in each volunteer fire corps' district in the town. When disasters occur, what we can rely on most is our families and people living in the neighborhood, where people can hear each other's voices.

Thus, we encourage each volunteer disaster prevention organization to practice the "*tonarigumi* for disaster prevention movement" in order to develop a community where communication among residents in daily life is valued.



- Volunteer fire corps are indispensable for local disaster prevention organizations. In order to ensure that the command system functions properly when a disaster occurs, we promote human resource development and enhancement of equipment to strengthen organizations.

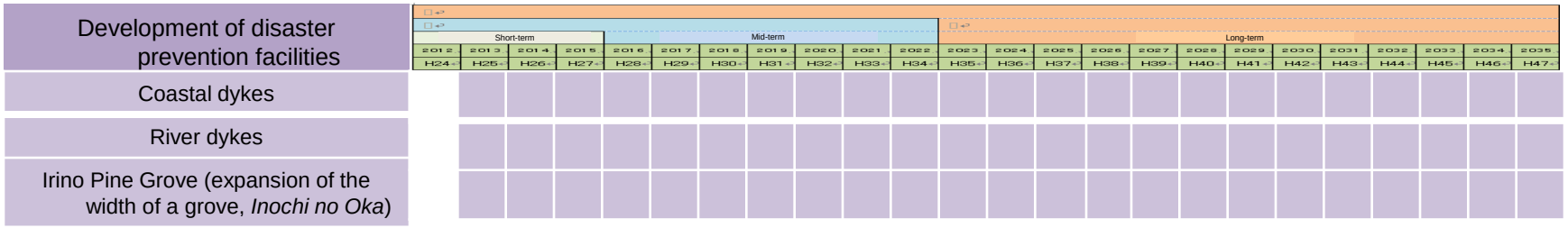
Evacuation environment (Evacuate when you feel tremors)



- Primary evacuation shelters, where people first evacuate, are developed with maximum consideration given to reducing the number of people who give up attempting to escape from tsunami. Therefore, two safety levels have been established for evacuation shelters in accordance with their locations, etc. We aim to develop evaluation facilities so as to ensure each resident can evacuate to a safer evacuation shelter based on his/her best judgment, depending on the situation when an earthquake occurs.

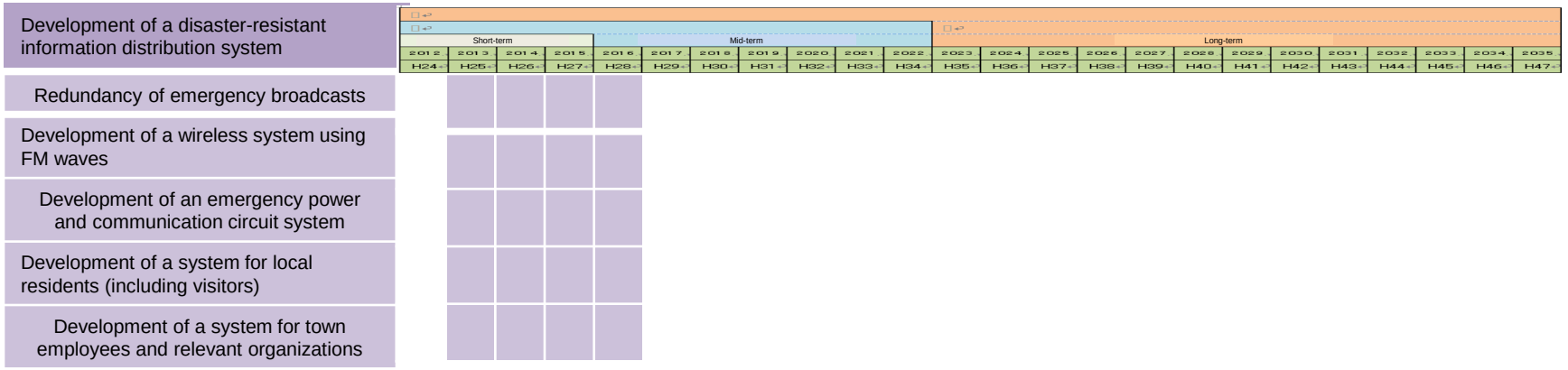
Under the long-term plan, however, we aim to develop a community where no residents will give up attempting to escape from tsunami and all residents can evacuate to primary evacuation shelters of Safety Level A. In addition, we are investigating the development of secondary and welfare evacuation shelters and management of evacuation shelters in order to prevent deaths associated with earthquake disasters.
We promote a construction plan of tsunami evacuation towers in the tsunami inundation area, where it may be difficult for people to evacuate on foot to evacuation sites on higher ground of Safety Level A.

In addition, we promote the development of main evacuation routes on the assumption that some people will evacuate by car. In areas where liquefaction phenomena are anticipated, we are investigating the design of liquefaction countermeasures.
Provided that their safety has been confirmed, we take the initiative to use new technologies (e.g., underground shelters) in tsunami disaster prevention facilities in order to reduce the risk of people giving up attempting to escape from tsunami.



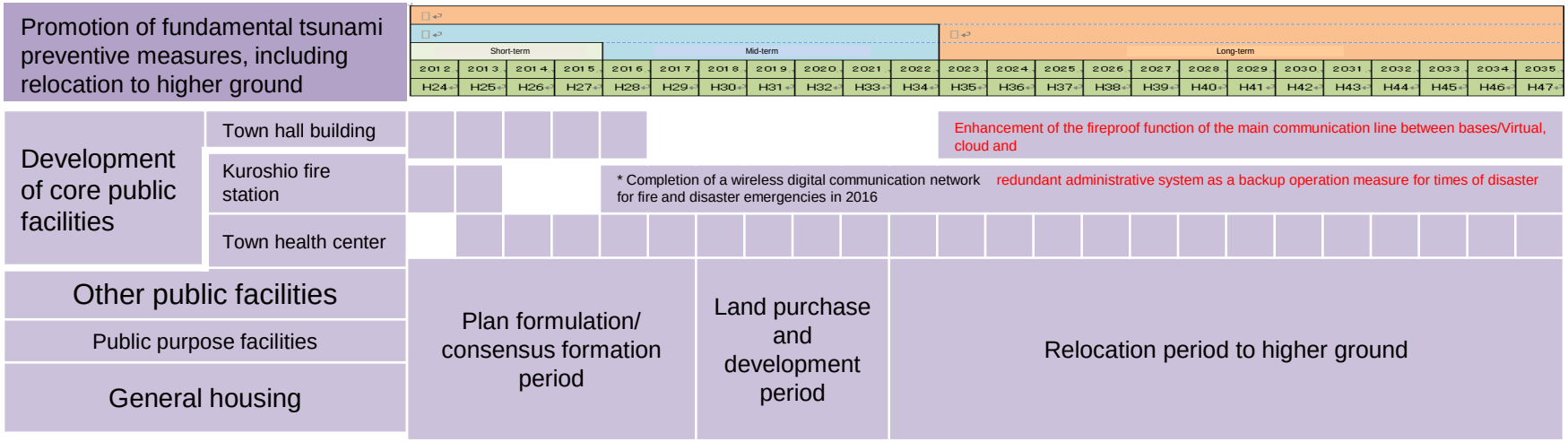
- We request that the national and prefectural governments develop facilities for tsunami prevention (e.g., a seawall, river levee, etc.) on the assumption of Level 1 tsunami.

In order to delay the time of tsunami inundation from rivers, during which people can evacuate, we are investigating enhancement of the disaster prevention function of the waterfront and construction of an artificial hill.



- In order to prevent/mitigate disasters, it is very important to distribute accurate information quickly. We have requested that the national government develop an earthquake and tsunami observation system. In addition, the information communication infrastructure in Kuroshio-cho is utilized to enhance awareness regarding disaster prevention among residents during normal times. We aim to build a framework for accurate information distribution in the event of an occurrence of an earthquake to ensure uninterrupted and streamlined information sharing among stakeholders.

Development of a surviving community (Fundamental measures)



■ We anticipate that we may not be able to receive sufficient support from outside the town immediately after a massive Nankai Trough earthquake occurs. In order to make the utmost efforts to protect residents' lives in such a situation, it is important to ensure proper functioning of the chain of administrative command. Accordingly, the core public facilities to be developed in the future shall be constructed outside the Level 2 tsunami inundation areas. As there are many buildings containing town-provided housing which do not meet the earthquake resistance standard, we plan to relocate them to higher ground during an early stage.

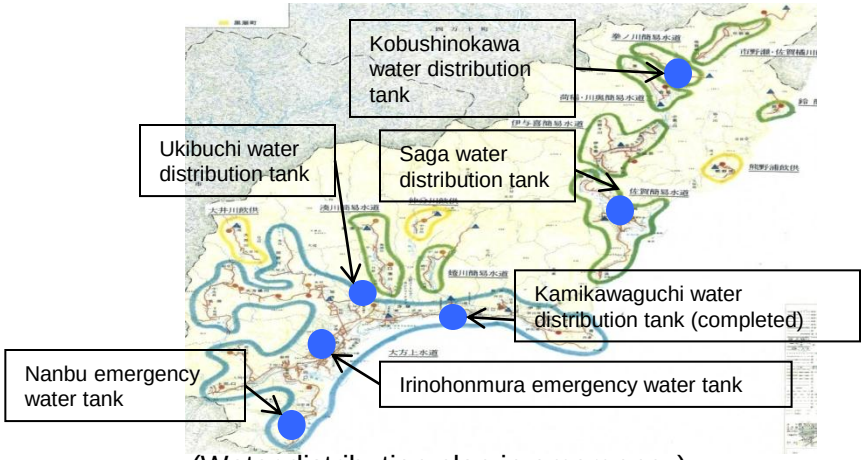
For nursery and school facilities, we plan to develop evacuation facilities so that children and students can reach Safety Level A evacuation facilities before their areas become inundated. At the same time, we have made scheduled evacuation drills obligatory.

Under the mid- and long-term plan, we aim to develop facilities outside the Level 2 tsunami inundation areas as soon as possible.

For housing for which it is difficult to ensure safety from Level 2 tsunami, the long-term plan has been determined in consideration of residents' opinions to construct new residential areas on higher ground or in inland areas in a phased manner. Relocation of public purpose facilities (e.g., hospitals) is also promoted as an integrated effort. In addition, dual-purpose measures aiming at both disaster prevention and revitalization of the hilly and mid-mountainous areas, including relocation to hilly and mountainous areas outside the inundation area, are an issue for discussion.

Strengthening of the risk management system		Short-term				Mid-term							Long-term													
		2012 H24-	2013 H25-	2014 H26-	2015 H27-	2016 H28-	2017 H29-	2018 H30-	2019 H31-	2020 H32-	2021 H33-	2022 H34-	2023 H35-	2024 H36-	2025 H37-	2026 H38-	2027 H39-	2028 H40-	2029 H41-	2030 H42-	2031 H43-	2032 H44-	2033 H45-	2034 H46-	2035 H47-
Stockpile plan	Town stockpiles					(Renewal of stockpiles)																			
	Medical supplies																								
	Fuel																								
	Agreement on reserved rice by farm households																								
	Drinking water	Emergency shut-off valve (Buchi, Saga and Kobushinokawa)/Emergency water tank (Irino and Nanbu districts)																							
			Research on well water																						
Preparation for emergency	Burial and cremation plan																								
	Human waste disposal plan																								
	Waste (rubble) treatment																								
	Medical relief plan																								
	Improvement for emergency medical treatment technologies																								
	Disaster volunteer acceptance plan		The disaster volunteer acceptance plan Includes a land use plan and securing of space for reconstruction materials and support vehicles in case of emergency.																						
Agreements	Disaster-affected area assistance agreements																								
	Registration of farmland in cooperation for disaster prevention																								
	Vehicle agreements																								

- Promotion of a stockpiling plan for one-week's worth of supplies to sustain our lives on our own
  We promote the preparation of our own stockpiling plan for supplies and risk management, thereby enabling us to sustain our lives for one week.
  We promote the conclusion of agreements with the local government and relevant organizations for wide-area support of disaster-affected areas as well as strengthen cooperation with private companies and organizations.



(Water distribution plan in emergency)

■ In conclusion…

In 2012, the Investigative Commission on the Nankai Trough Massive Earthquake Model of the Central Disaster Management Council (part of the Cabinet Office) released its report containing estimates of seismic intensity distribution, tsunami heights, inundation areas, and damage induced in the event of a massive earthquake in the Nankai Trough. We at Kuroshio-cho give high praise to the commission members for their efforts to produce the report based on the most advanced scientific knowledge currently available together with the lessons learned from the Off the Pacific Coast of Tohoku Earthquake in March 2011 as well as their courage to release this report to the public.

The report scientifically indicates the possibility that the worst earthquake and tsunami disasters could hit our hometown of Kuroshio-cho; a seismic intensity of 7 and tsunami height of 34 m are the most severe estimate in Japan, which we cannot easily believe. However, we must face the reality presented to us.

Whatever difficulties await us ahead, we must protect our hometown, which we inherited from our ancestors, and firmly pass it on to the next generation. It is our urgent task to take initiatives to that end.

We already have felt the pain of harmful rumors about the town, to which the most dangerous damage figures in the nation have been attached. Unless we develop strategic measures, there is a possibility that the town will get caught in waves of population decline before the next Nankai earthquake occurs.

We expect the national government to provide strong support through systems and policies to help municipalities face the reality and take effective measures to prevent bankruptcy due to taking disaster prevention/mitigation measures to protect residents' lives.