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Special Edition

Post-earthquake reconstruction continues to blaze trail into uncharted territory

- Interview with Shinya Endo, General Manager,
Miyagi Prefecture Civil Engineering Department -

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Executive Summary

Miyagi Prefecture was particularly hard-hit by the catastrophic Great East Japan Earthquake of March 2011. It is now implementing a ten-year reconstruction plan in three phases. The first phase (three years) is restoration to the pre-earthquake status quo. In the second phase (four years), the Prefecture plans to revitalize (upgrade) its infrastructure to where it would have been if the earthquake had never occurred. In the third phase (three years), the Prefecture aims to better fortify itself against future natural disasters. With no model to follow for any of the three phases, Miyagi Prefecture is grappling with difficult challenges on a daily basis. NRI's Fumihiko Kamio spoke to Shinya Endo, head of Miyagi Prefecture's reconstruction program, about the challenges that lie ahead in 2014, the first year of the ten-year plan's revitalization phase.



Shinya Endo

General Manager,

Miyagi Prefecture Civil Engineering Department

Hired by Miyagi Prefecture in 1979. Has worked at prefecture's Ishinomaki Civil Engineering Office, Urban Planning Section, Sendai-Higashi Civil Engineering, Kessennuma Civil Engineering, Road Construction Section, Civil Engineering General Affairs Section, Tokyo Office, and Planning Department's Policy Section. Promoted to Deputy General Manager of Civil Engineering Department in April 2011 after managing Urban Planning Section and Roads Section. Assumed current post in April 2013. Facilitated establishment of Tohoku Rakuten Golden Eagles professional baseball team in 2006 while assigned to Planning Department's Policy Section. Directed reopening of roads to relieve great East Japan Earthquake victims' isolation while manager of Roads Section. Directed program to help tsunami-devastated coastal communities formulate reconstruction plans while Deputy General Manager of Civil Engineering Department. Member of Tagajo Reconstruction Working Group, Minamisanriku Reconstruction Plan Formulation Committee and Onagawa Reconstruction Plan Formulation Committee. Serves as observer on Iwanuma Reconstruction Committee and Watari Reconstruction Committee. Currently directs restoration and reconstruction projects as General Manager of Civil Engineering Department.

**Fumihiko Kamio***General Manager,*Social Systems Consulting Department,
Nomura Research Institute

Joined NRI in 1991. Managed the Public Management Strategy Consulting Department and served as director of NRI's Center for Strategic Management and Innovation's Strategy Research Office before assuming current post. Member of the Ministry of Internal Affairs and Communications' Public Corporation Management Strategy Formulation Research Committee, Miyagi Prefecture's Working Group on Vision for Revitalization and Reconstruction of Teizan Canal, and Ministry of Land, Infrastructure, Transport and Tourism's Sewage System Antiseismic/Anti-tsunami Technology Working Group's Subcommittee on Reconstruction Assistance Schemes. Co-author of Redesigning Societal Infrastructure to Create Markets and Jobs (in Japanese).

Transitioning from restoration to revitalization

Kamio: March 11 will be the third anniversary of the earthquake. On the day of the earthquake, I was scheduled to meet with you at your office. I was in the vicinity of Nasushiobara on a Sendai-bound bullet train when the earthquake struck. The train nearly overturned.

Endo: With everything such a shambles up here, I was just hoping you could make it back to Tokyo safely.

Kamio: Now here we are three years later.

The Miyagi Prefecture Reconstruction Plan is split into a three-year restoration phase, four-year revitalization phase, and three-year development phase. You will soon be transitioning from the restoration phase to the revitalization phase. I imagine the restoration phase has progressed as planned in some areas and hit snags in other areas.

Endo: Restoration work in Miyagi Prefecture's inland areas has proceeded smoothly and will be just about completed in fiscal 2013. In coastal areas that suffered tsunami damage, however, restoration work is still only about 30% complete overall. Tsunami-inundated areas were rendered uninhabitable. Residents of those areas have to be relocated inland or to higher ground. We consequently have to secure land and build

new communities. We have run into complications in terms of problems with such building sites, coordination with the national government, and so on. As a result, we have fallen somewhat behind our initial schedule.

Kamio: Is there a gap between inland and coastal areas even in terms of restoration of public infrastructure such as roads, water mains and sewage systems?

Endo: Yes, there is. Coastal areas that suffered major tsunami damage will be rezoned for industrial use or tourism. People will no longer reside in these areas. We need to build infrastructure as we recruit businesses and industries to relocate there. We are consequently not yet able to restore vital infrastructure in these areas. Currently, we are working hard to prepare high-elevation residential sites for construction.

Kamio: As I recall, you plan to relocate residents to nearly 200 high-elevation sites.

Endo: We are planning 195 residential developments. We have received all required construction permits from the Ministry of Land, Infrastructure, Transport and Tourism. Work is already underway at 152 of these 195 developments. The housing sites are being developed as a project to promote mass relocation of residents in the aim of disaster prevention. However, the process of finding and preparing housing development sites takes time.

Progress of course differs among municipalities within Miyagi Prefecture. Among coastal communities, I believe that reconstruction is generally progressing well in the town of Minamisanriku.

Kamio: Is relocation of earthquake victims from temporary housing to public housing proceeding as planned?

Endo: The problem is that few public housing units have been completed so far.

In Miyagi Prefecture, we plan to build 15,000 new public housing units for earthquake victims, but only 266 units have been completed (as of December 31, 2013). In fiscal 2014, we plan to be able to supply around 7,000 units. Additionally, residents that plan to rebuild their own residences will be able to do so once the building sites now being prepared as part of the mass relocation project are ready for construction.

Living in temporary housing is very stressful. Our biggest mission is to swiftly relocate

residents from temporary housing to public housing or their own newly rebuilt homes.

Kamio: As you transition from the restoration phase to the revitalization phase, what kinds of new challenges do you expect to encounter?

For example, I read that populations are decreasing more rapidly than anticipated in municipalities along the Sanriku Coast. If initial population projections are lowered, reconstruction plans would have to be revised. Don't you face a dilemma where you need to take the time to build good communities while also rushing to finish the restoration and revitalization phases before even more people leave Miyagi Prefecture?



Endo: That is a huge issue. With the Japanese public supporting our reconstruction efforts by paying more taxes, we will look like we have wasted taxpayers' money and may end up with inefficient reconstruction if there are any vacant lots in the new residential developments. The same applies to vacant units in public housing for earthquake victims.

Going forward, identifying what needs to be done to complete our reconstruction program as initially planned will be a key priority.

Kamio: As reconstruction progresses, will disparities in population and economic conditions between certain municipalities worsen relative to before the earthquake?

Endo: Such disparities are already evident. Miyagi Prefecture's rate of population decline has slowed. In fact, Miyagi now outranks Niigata Prefecture in terms of population. However, this slowdown in depopulation is driven by the Sendai Metropolitan Area (the city of Sendai and surrounding municipalities).

Kamio: Now that the restoration phase has been largely completed, to what extent is Miyagi Prefecture's population concentrated in the Sendai Metropolitan Area?

Endo: The Sendai Metropolitan Area's population is roughly 1.5 million, well over 50% of Miyagi Prefecture's population of about 2.33 million.

In coastal municipalities from Kesenuma to Ishinomaki, rates of population decline are high across the board. Moreover, these municipalities are still losing population.

Talk of overbuilding relative to population is consequently inevitable no matter what we do.

However, even if some land is not used by residents left homeless by the earthquake, we cannot leave it sitting idle. We would need to waive national government subsidies for such property and then have local municipalities come up with a plan to make it available even to persons who did not lose their homes. Another possible idea for using surplus land is to make residential lot sizes a little larger than initially planned. Of course, if populations are much smaller than initially planned, we could also scale down residential development projects.

Urban renewal in Miyagi Prefecture

Kamio: Your reconstruction program is truly urban renewal in the sense that you will rebuild housing in completely new areas and convert former residential areas to new uses.

Endo: It is a big undertaking. Meanwhile, we are also dealing with depopulation and demographic aging.

Kamio: I feel that other communities are looking to Miyagi Prefecture set a precedent for how to resolve such issues.

Endo: Instead of merely rebuilding from the devastation wrought by the earthquake, I believe our reconstruction program must serve as a how-to manual for building communities.

Kamio: Tell me about some municipalities with distinctive approaches to reconstruction. The town of Yamamoto, for example, has been the subject of much media coverage.

Endo: There are several such municipalities, including Yamamoto.

The JR Joban Line, which was damaged by the earthquake, will be moved inland. Yamamoto will likewise rebuild further inland. When it does, it plans to develop two large residential neighborhoods, each of which will be served by its own newly built railway station. In my opinion, the plan is a model of bold community redesign.



In Iwanuma, where six residential neighborhoods were destroyed by the tsunami, the city plans to rebuild all housing in a single cluster where all residents will reside. It has already started to transfer residential lots to residents. Given the difficulty of consolidating neighborhoods, I consider Iwanuma's plan to be groundbreaking.

Iwanuma is also building multiple lines of defense against future tsunamis. It is building a seawall as its first line of defense. Behind the seawall, it is creating a hill called Sennen Kibo no Oka (Hill of Millennial Hopes), which will serve as an evacuation site. The city will plant trees on the hill to create a wooded area. This is the second line of defense. As a third line of defense, the city plans to strengthen embankments along the Teizan Canal on the inland side of the hill. On the inland side of the canal, the city will heighten an earthen embankment and build a road on top of it. Through these four lines of defense, Iwanuma plans to protect its inhabitants from tsunamis.

In northern Miyagi Prefecture, I believe that Onagawa will be a model town. It has undertaken a large-scale civil engineering project to revitalize its central district. It has closed off part of the construction zone to pedestrians to ensure that construction proceeds safely, without any accidents. Onagawa is another example of bold community redesign.

In Higashimatsushima, the city is developing upland residential lots in its Nobiru District, but the process entails removal of lots of dirt. The dirt is being moved by belt conveyors to low-lying areas that sustained tsunami damage.

Kamio: Belt conveyors?

Endo: Moving dirt by dump truck causes noise, vibrations and road damage that have become a public nuisance within the prefecture. Belt conveyors are being used as one method of moving large quantities of dirt without such problems. This is also highly innovative in my opinion.

Kamio: Compact cities are highly regarded as a general concept, but in actuality I suspect that many people are resistant to moving to the city center from the periphery (former residential neighborhoods). Yamamoto and Iwanuma both aim to be compact cities, albeit on different scales. Although special circumstances, namely the earthquake, are involved here, what type of issues have you had to resolve when persuading residents to live in the center of town?

Endo: The answer is different for each municipality. They each have their own visions and challenges. Miyagi Prefecture contains the Sanriku Coast, a ria coastline, to the north of Sendai Bay and the low-lying Sendai Plain to the south. Yamamoto and Iwanuma, which I mentioned earlier, are towns with low elevations and flat topography.



Developable land is relatively readily available in such places. Additionally, these towns are heavily populated with farmers. Perhaps for this reason, there is relatively little opposition to separating residential neighborhoods from residents' livelihoods. Residents in these towns were persuaded to relocate their residences by allowing

them to farm on the land where they previously lived or newly developed farmland.

Along the Sanriku Coast, by contrast, many residents are fishermen, largely due to land scarcity. Their lifestyle entails living on the shore, always keeping an eye on the sea, and taking their boats out to fish. In such fishing communities there is strong opposition to separating residents' homes from their livelihood, making it very difficult to consolidate residential neighborhoods into fewer, larger neighborhoods. Sanriku coastal communities are consequently rebuilding with the same number of residential neighborhoods as before the earthquake.

Kamio: So you are employing various approaches to developing compact cities, depending on the local topography, industry mix and employment structures. Such variety will yield some very instructive case studies.

Endo: We have a duty of accountability to the Japanese public with respect to how we are carrying out reconstruction. We want to keep the public informed of our progress restoring and revitalizing every town. It would be nice if some of these towns are singled out as examples for others to follow.

Hoping to resolve labor shortages

Kamio: A shortage of construction workers is often cited as a factor delaying reconstruction. One often hears that a large percentage of construction contracts fail to attract satisfactory bids because companies are not bidding. I imagine that the municipalities putting contracts out to bid are also shorthanded. What is the current status in terms of manpower?

Endo: First, Miyagi Prefecture's Civil Engineering Department has about 1,000 personnel. Over 110 people from throughout Japan have come here to assist us. Additionally, we have about 100 temporary personnel on three- or five-year assignments. Thanks to such people's help, the Prefecture's workforce is about 20% bigger than normal.

Before the earthquake, the Prefecture's annual budget was around ¥100 billion. In fiscal 2013, it is over ¥400 billion, including funding carried over from the previous fiscal year. The fiscal 2014 budget will exceed ¥500 billion. In other words, our budget has increased fivefold while our workforce has grown only 20%. We currently do not have enough manpower to keep up with the construction-related workload, including design, cost estimation, supervision, and inspections.

There is a shortage of construction workers also. Some construction contracts have not garnered any bids. Municipalities tend to think that large-scale contracts are more efficient, but larger contracts require more construction workers, so contractors end up not bidding because they do not have enough workers.

Moreover, we have recently been experiencing severe shortages of materials also. More and more projects are running into difficulties as a result. I believe we must seek out solutions by negotiating directly with contractors.

Kamio: Management and maintenance of restored and revitalized infrastructure will also be an issue going forward. The large amount of infrastructure revitalized through the reconstruction process will have to be maintained and managed on an ongoing basis. Miyagi will not be spared from the nationwide problem of aging infrastructure. How will you deal with this issue without substantially expanding municipalities' workforces?

Endo: While we in fact must rush to complete reconstruction, we are placing priority on building durable, maintenance-free structures as we do so.

Technological innovations have made it possible to automate maintenance inspections. Technologies that detect defects in structures, such as infrared and ultrasound, are also advancing. We are using techniques to reduce maintenance costs and increase durability and longevity, such as automating maintenance inspections as much as possible.

Kamio: The national government's Japan Revitalization Strategy also emphasizes utilizing such technologies and materials to facilitate infrastructure maintenance. Miyagi may become the first prefecture to realize this aim.

Continuing to push forward with reconstruction program

Kamio: In addition to what we have already discussed, another key project is underway in the region now under reconstruction. Could you talk about this project?

Endo: Privatization of Sendai Airport is a major project undertaken as a priority of our prefectural governor. Transferring management of the airport to the private sector will improve passenger convenience and should ultimately lead to growth in passenger traffic, thereby helping to revitalize the region. There are also plans to rezone land near the airport for new uses.

At the time of the Great East Japan Earthquake, we learned an important lesson from Iwate Prefecture, where the city of Tono became a base for supplying manpower and materials to neighboring cities such as Kamaishi, Miyako and Ofunato. Miyagi Prefecture did not have such a base, partly because the buildings that house the prefectural government are near the devastated areas. So we acquired from Japan Freight Railway a plot of land adjacent to a public park in Miyaginohara, Sendai, where the Tohoku Rakuten Golden Eagles baseball team's stadium is located. We plan to turn the site into a regional disaster preparedness facility, like in Ariake, Tokyo.

Kamio: You are involved in projects that extend beyond Miyagi Prefecture, correct?

Endo: Miyagi and Iwate Prefectures are jointly working on bringing the International Linear Collider (ILC) to the region. The Kitakami Mountains have been selected as a candidate site for construction of the ILC in Japan. If the Kitakami Mountains are chosen as the ILC's site, the regional economy would benefit tremendously.

In addition to partnering with neighboring prefectures, we are also working together with universities, most notably Tohoku University, to bring a photon research center or other such facility to the region. We expect such initiatives to bolster Miyagi Prefecture's economy from another angle.

Kamio: Aside from privatization of Sendai Airport, what are your expectations with respect to the private sector?

Endo: The auto industry's earnings have been steadily growing even since the earthquake. The auto industry is so broad-based that once it sets up production operations in a region, related industries also increase. We hope that many companies come to the region and expand business opportunities here.

Currently, private investment is concentrated in inland areas where infrastructure development is underway. We expect industries to subsequently move into coastal areas also. When that time comes, we believe that developing secondary and tertiary industries linked to agriculture and fisheries will be an important key. We think that increasing the added-value of local products such as seafood would be very beneficial for local residents.



Kamio: When Tokyo hosts the Olympics in 2020, I believe that Miyagi will be in the final phase of its reconstruction program. What kind of impact will the Olympics have on reconstruction activities?

Endo: Some people seem to be worried that once preparations for the Tokyo Olympics begin, workers involved in reconstruction up here will shift to Tokyo, but if reconstruction is largely completed by then, I do not expect the Olympics to have much impact.

Miyagi Stadium in Rifu is slated to be the Olympic soccer venue. Prefecture residents generally welcome the Tokyo Olympics.

Kamio: It would be nice if visitors arrive at Sendai Airport and then fly home from Tokyo after extensive sightseeing in between.

Endo: That could very well happen. I think many people from Japan and overseas would like to visit Japan for the Olympics and travel to different parts of the country while they are here. I assume that quite a few people would like to come to see how the areas stricken by the Great East Japan Earthquake have recovered. We must take advantage of this opportunity. We have to do a good job with reconstruction, lest we disappoint Olympic visitors.

Kamio: The cherry trees lining banks of the Teizan Canal should also be a big tourist attraction. The canal is the longest in Japan, correct?

Endo: It spans 50 kilometers in total, albeit not contiguously. An NPO in Fukushima is planting cherry trees all the way to Route 6. If they continue northward to Teizan Canal, we would have a 200km-long line of cherry trees stretching to Ishinomaki from Iwaki in Fukushima.

Kamio: That would be a spectacular sight. That is one way to create extra added-value.

Lastly, various working groups have been formed to prepare for an earthquake directly beneath the Tokyo area or a Nankai Trough quake. What message would you like to convey in terms of what should be the focus of such preparations and how to build communities and consensus among local residents?

Endo: First, we who were directly affected by the earthquake have a responsibility to inform the Japanese public of the devastation wrought by the earthquake, our progress toward reconstruction, and the lessons we have learned from this experience. In particular, emergency evacuation readiness is very important.

How swiftly people evacuate can determine whether they survive or perish. It is important to always be aware of evacuation routes, evacuation centers and other evacuation sites. Additionally, in tourist areas, measures must be taken to ensure that strangers are also able to evacuate.

We are building seawalls to protect against future tsunamis, but such construction takes time. While we must be thoroughly prepared in terms of such physical infrastructure, intangibles such as evacuation readiness are definitely necessary.

In Kamaishi, all elementary school and middle school students who were at school when the earthquake occurred survived the tsunami. Their 100% survival rate is being called miracle of Kamaishi. They survived because they were taught to immediately flee if an earthquake strikes, thanks to Gunma University Professor Toshitaka Katada, who had tenaciously led a disaster preparedness program for Kamaishi schools.

Kamio: Three years after the earthquake, the crisis mentality has abated somewhat, but we must never cease to endeavor to instill a disaster preparedness mindset in the Japanese public as a whole.

Thank you for sparing your valuable time to speak with me today.

about NRI

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