Lessons learned: Training programs for post disaster recovery from the Great East Japan Earthquake

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Abstract and Introduction:

A large number of libraries experienced books falling from the shelves and scattering over the floor when the Great East Japan Earthquake occurred on March 11, 2011. Damage caused by the impact included torn leaves, broken spines and detached covers. Among the libraries in the affected area, there has been much demand for training in practical techniques for the recovery of damaged books.

This paper gives an overview of the training programs the National Diet Library (NDL) conducted in response to requests from the prefectural libraries which worked hard to assist struggling local libraries.

The programs offered workshops on basic repair, protective folder making and drying of water-damaged books and mold removal. It is beyond the power of non-specialist librarians to salvage huge amounts of water-soaked materials. But there is a likelihood that they will need to handle a small number of damp or partially wet materials during an air-conditioning breakdown, leaking pipes or other water damage resulting from an earthquake. Actual incidents of that sort in the Great East Japan Earthquake were reported and that was one of the reasons that the programs had workshops on the recovery of water and mold-damaged books.

This paper describes how the partnership that the library community had already developed for a long time worked through the programs, the role of the prefectural libraries, and how and why the participants from local libraries were encouraged to share what they had learned in the workshops with their colleagues. Updating the programs based on the feedback and the newfound knowledge was also outlined along with some other training activities conducted by other institutions. The future issues that came up in the course of the programs and other lessons we have learnt are mentioned in the last part of this paper.

2 The Great East Japan Earthquake

On March 11, 2011 at 2:46 p.m. (Japan Standard Time), an earthquake of magnitude 9.0, the largest to hit Japan since records began, struck with an epicenter in the Pacific Ocean off Japan. Kurihara City, Miyagi Prefecture was shaken by level 7 tremors, the highest rating on the Japanese seismic intensity scale. Violent tremors and a subsequent tsunami caused severe damage over a wide area of the Pacific east coast from the Tohoku (north-east) to the Kanto (south-east) region. The disaster took many lives and large numbers of people are still missing.

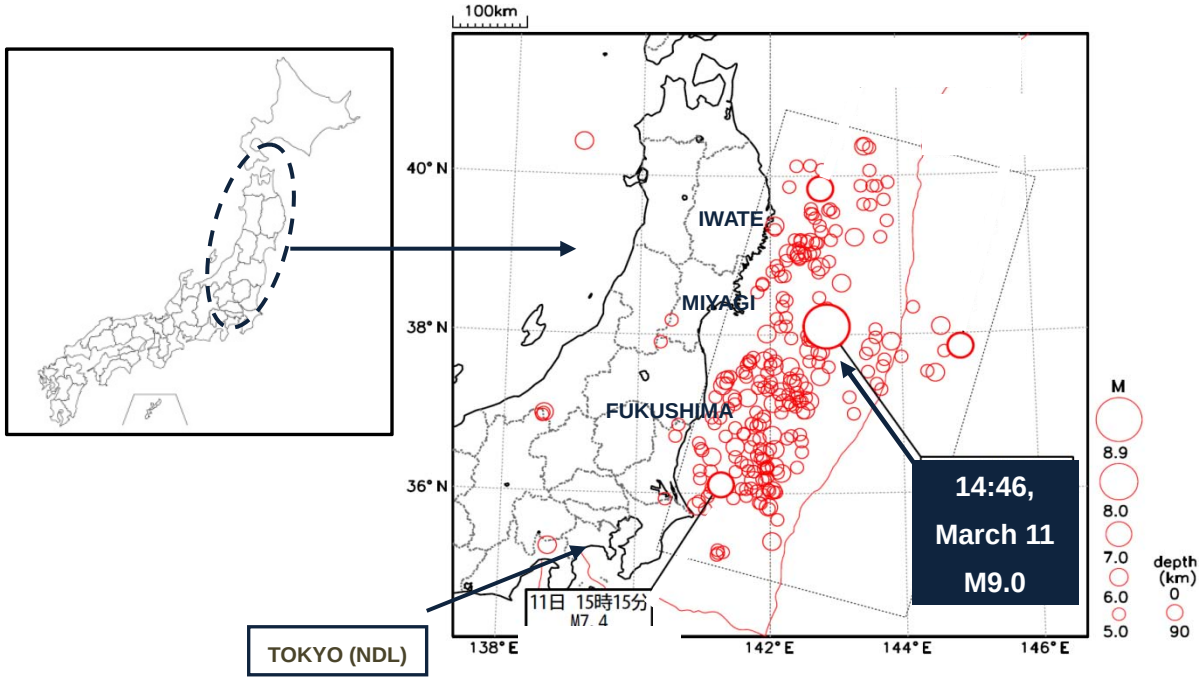

Figure 1 Epicenter of the Great East Japan Earthquake

2-1 Damage to libraries[1]

Based on information from the ministry of Education, Culture, Sports, Science and Technology (MEXT), a total of 251 public library facilities (out of 3,190 in Japan[2]) were described as physically damaged. MEXT data describes the following conditions of major damage: "The collapse and burning of buildings; submerging, immersion, or flooding due to the tsunami; land subsidence; cracks on or changes in the level of buildings; outer wall or ceiling collapse; outer wall cracking; glass damage; etc."

In addition to the main event on March 11, the aftershock on April 7 (recorded at magnitude 7.1) also caused serious damage to library facilities, equipment, books and other materials. It is important to note that much attention was paid to damage along the Pacific Coast caused by the tsunami, but earthquake damage further inland was also severe. Cases of such damage, shown in table 1, were mainly centered in Iwate, Miyagi and Fukushima. These are the three prefectures in the Tohoku region that experienced the worst of the earthquake's tremors.

IWATE	MIYAGI	FUKUSHIMA
➢ Only 8 out of 57 total libraries (14%) reported no damage ➢ Most libraries experienced toppling or destruction of bookshelves, bookcases and glass cases ➢ Many libraries had books and other materials thrown down	➢ Most libraries (out of 41 total[3]) experienced toppling or destruction of bookshelves and bookcases ➢ All libraries had their books and other materials thrown down ➢ At the Miyagi Prefectural Library, "nearly all 1,050,000 materials" fell during the main quake and "half fell" during aftershocks	➢ About 12 out of 64 total libraries (19%) reported no damage ➢ Most libraries had their books and other materials thrown down ➢ Damage ranged from "100% of materials fell and scattered" to "some of materials fell "

Table 1 Damage to public libraries in Iwate, Miyagi and Fukushima

2-2 Damage to the National Diet Library

At the NDL which is located in Tokyo (Kanto region), about 1,800,000 books in the stacks of the Main Building fell from the shelves. Most of the books that fell were on the upper floors;

[1] NDL Research Report No.13 " The Great East Japan Earthquake and Libraries" p327-336 9.2.1 The State of Damage
[2] "Statistics on Libraries in Japan 2011" p20 Prefectural Summary Tables
[3] "Statistics on Libraries in Japan 2011" p20 Prefectural Summary Tables

the higher the floor, the more books fell. As soon as the aftershocks subsided and the building's safety had been confirmed, staff members from the whole library and contractors set to work putting the fallen books back on the shelves. Among many damaged books, there were about 500 volumes which could not be put back in service without any recovery treatment. The Preservation Division of the NDL has been undertaking remedial work on those books to this day.

3 Training Programs for post disaster recovery

Since July 2011, the NDL conducted training programs for post disaster recovery in Iwate, Miyagi and Fukushima. It was the prefectural libraries which played a major role in putting the programs into practice. All three of the prefectural libraries made library visits in the affected areas many times and saw the local libraries faced with large numbers of damaged books and not knowing what action to take, as most of such libraries have no preservation teams or specialists of their own. The prefectural libraries then consulted with the NDL, which has a department in charge of preservation, in order to provide training programs to the local libraries. In Miyagi Prefecture, the programs were conducted not only for the public libraries but also for the University libraries in the Tohoku region.

3-1 Basic repair

Among the local libraries, there had been much demand for workshops in practical techniques of repairing damaged books with torn leaves, detached covers, etc. To meet the needs, the training programs usually contained workshops for basic repair. As most of the participants were non-specialist librarians in local libraries, the workshops started with a brief introduction to the features of paste, Japanese paper and other materials used for repair, and use of tools. The workshops then proceeded to actual repair work on sample books which had been torn and had pages detached beforehand. Another example of repair works included in the workshop was of putting detached covers back on the spines. A sheet of durable paper folded into a tube shape is used for this technique. The tube is glued on the spine of the book first, then, the detached cover is glued on top of that. The tube creates a hollow between the spine and the cover. That helps the book to open wide and eases the strain on the spine.

Procedures for repairing squashed book corners and split joints were also demonstrated to the participants as possible ways to apply basic repair techniques they had learnt at the workshops.

Figure 2 The tube glued on the spine

Figure 3 The detached cover to be glued on the tube

3-2 General Guide

In addition to the basic techniques, there were many requests from participants to learn how to determine which books need repair and to what extent that repair work should be done. To cover such topics, lectures were given to the participants before the workshops. Regardless of the types, libraries are obliged to maintain and keep their collections accessible. As it is not realistic for any libraries to retain complete collections at the same level, it is important to set priorities on the collections and select materials that each individual library should take responsibility for preserving for a long period of time. The lecture highlighted this basic concept of preserving library collections as it answers the requests from participants to some extent and fits the process of disaster recovery. Damaged materials which have enough stability to be handled with care do not require swift action. Materials badly damaged but not often used will also be given a lower priority for recovery. Many of the circulating materials can be replaced and there is an option of disposal if the materials are not worth spending time and resources on recovery.

There are a variety of repair techniques available for recovery of damaged materials, from ones that non-specialist librarians can handle to others that should be undertaken only by well trained staff. Deciding which option to apply to a material can also be influenced by how long the material is to be retained. The lectures put emphasis on the importance of choosing appropriate options derived from the projected lifespan of the materials and how they are used.

3-3 Recovery of water- and mold-damaged books

According to statistics from the Iwate Prefectural Library, five libraries in the prefecture were devastated by the tsunami. The approximate number of damaged materials belonging to those libraries would come to more than 206,000. That is about 4.2% of the total number of materials housed in the whole prefecture.

It is beyond the power of non-specialist librarians to salvage huge amounts of water-soaked materials. Extensive assistance of specialist groups and volunteers was crucial, and salvage at the initial stage in areas struck by tsunami and subsequent recovery projects have been led by the ally. But it can happen to any librarians to have to handle a small number of damp or partially wet materials, possibly infected with mold, during an air-conditioning breakdown, pipe leak or other water damage resulting from earthquake. Getting training on first-aid treatment for water- and mold-damaged books will help librarians to take appropriate action in good time.

The program held at the Iwate Prefectural Library included a workshop on drying wet materials. The simple air-drying method using interleaving paper and fans was introduced. The workshop also covered mold removal. Participants learnt procedures to treat infested materials with disinfectant ethanol and brushes. Dummy books were used for this practice. The health hazards and allergic reactions caused by molds, and mechanism of mold outbreaks, were mentioned and emphasis was put on the importance of ensuring safety of people and environmental control.

Figure 4 Book stood on its end and interleaved

(Colored water has been used to wet the demonstration book shown above)

Figure 5 Circulate the air with fans

3-4 Protective enclosure

Protective enclosures keep out dust, dirt and light. Housing materials into enclosures provides a buffer against changes in temperature and relative humidity, and provides protection from improper-handling. Not just protecting materials from causes of deterioration and damage, they also act as a buffer against the impact of natural disasters.

A handy, easy-to-make enclosure was introduced at the workshops because protective enclosures can be used to prevent materials which cannot be repaired from further deterioration.

Figure 6 Four-flapped folder introduced at workshops

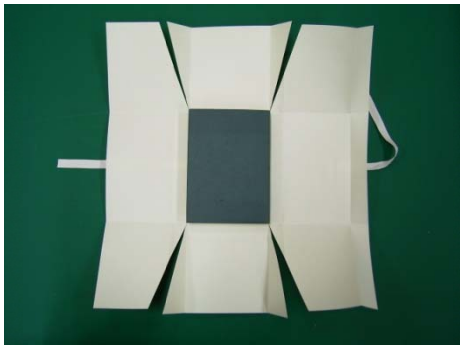

Figure 7 Four-flapped folder opened out

3-5 Collaborative Partnership

The training programs for post disaster recovery were conducted as a part of relief activities for local libraries, and the three prefectural libraries led those activities. Libraries are entities which have been cooperating with others on a daily basis. There has been a cooperative framework in the library community to call for help and respond to the call, from local libraries to prefectural libraries and from prefectural libraries to the national library. Interlibrary loan, reference service and many other tasks libraries undertake are based on this framework, and it did work to some extent even at the time of disaster and in the process of recovery. The training programs are only one example of activities promoted through the collaborative partnership that the library community had developed over a long time. The participants from local libraries were encouraged to share what they had learned in the workshops with their colleagues by providing workshops in their own and neighboring libraries so that many more librarians could benefit. It also shows how the collaborative partnership of the libraries was practiced.

4 Relevant training activities

Among other relevant training activities promoted within the country, the Japan Library Association (JLA) hosted The Basic Repair Training Program for Volunteers.

The JLA recruited volunteers for repair work which was to be undertaken in response to the calls from affected libraries. The program offered workshops in basic repair and around 20 of the trainees then joined volunteer activities in affected libraries. As well as repairing damaged materials, the volunteers took part in cleaning and preparing donated materials for library use. All of this work was conducted upon request from the affected libraries.

The Tokyo Document Recovery Assistance Force has also been promoting training activities. It is a voluntary organization of specialists established to develop a package of recovery techniques such as cleaning, aqueous treatment, drying and flattening to be applied to damaged document materials. The organization has provided technical training for the operation of the package free of charge. The targeted trainees were job seekers in the affected areas, because one of the organization's goals was to create work opportunities within those areas. The organization has worked together with the National Archive of Japan and provided support for local archives or other related institutions affected by the disaster.

5 Review of learning tool

The NDL is now revising the learning tool we used in the programs based on feedback. It is supposed to reflect the needs and requests of participants such as editing handouts to be as simple as possible so that they can be used as quick guides when disaster does strike. Introducing video clips is also being discussed as it will help participants understand work procedures more easily and wherever they are.

6 Future issues

The training programs that the NDL conducted last year focused on disaster response and recovery. This was because the programs had been developed to answer the needs of the libraries in the affected area to learn practical techniques of repairing damaged books. As post disaster recovery progresses, there will be more demand for training in disaster preparedness, and then comprehensive programs for disaster planning.

The Great East Japan Earthquake caused severe damage to many libraries. But it is also true that many of us learnt a lot through this experience. To make full use of it, the NDL needs to integrate newfound knowledge into the training programs.

The following are examples of the knowledge that many libraries gained from the experience: store books slightly inside the edges of shelves, avoid storing heavy books on the

top shelf, and place a batch of thin books in one storage box to make the whole stable on the shelves. All the measures described above will prevent books from getting thrown down when an earthquake occurs. There were libraries which had experienced large earthquakes before the Great East Japan Earthquake and prepared for the next ones to come. Reports from such libraries proved that the countermeasures against earthquake disaster they had introduced were effective. This is information that should be included in programs for disaster planning.

As for disaster response and recovery, the importance of setting priority for salvage should be emphasized more. Materials of local history, culture or materials concerning the identity of a particular community are always given priority. Among those, the materials that are unique, irreplaceable, and unavailable anywhere else in any form should be saved first. Deciding what should be done to which materials, and to what extent, is as important as selecting what to save.

Furthermore, the programs conducted last year only handled damaged books and other paper materials. To include the recovery of broader types of materials into the programs, we must start almost from scratch. Gathering useful information and finding best practice will be the next step that we need to take.