EDITORIAL: RESPONDING TO DISASTERS - THE ROLE OF PROTECTED AREAS

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ABSTRACT

The costs of storms, floods, earthquakes, landslides, ocean surge and desertification are increasing; and with each event natural capital is also lost in terms of healthy ecosystems, species and ecosystem services. Despite increased spending on disaster risk reduction (DRR) strategies, well over a million people died as a result of natural hazards in the last decade. We need to rethink how to manage DRR. One strategy poorly recognised and under-exploited to date is the role of natural ecosystems in protecting against and mitigating from disasters and the role of protected areas in maintaining these ecosystem services. This editorial reviews how protected areas can support DDR and draws specifically on responses to the Great East Japan Earthquake in 2011.

KEYWORDS: disaster risk reduction, protected areas, Great East Japan Earthquake

Humanity is fighting a losing battle against the impact of natural hazards. Despite spending ever larger amounts of money on disaster risk reduction (DRR) strategies, the costs of storms, floods, earthquakes, landslides, ocean surge and desertification are increasing. Well over a million people have died as a result of natural hazards in the last decade (Vinck, 2013); far more than died in armed conflict during the same period. At the same time, the economic costs of disasters are escalating. The 2013 edition of the *Global Assessment Report on Disaster Risk* (UNISDR, 2013) reports that over a trillion dollars in economic losses have been recorded for the first decade of the 21st century, but even this is admitted to be a substantial under-estimate, for instance missing uninsured losses from recurrent, small-scale disasters in low and middle income countries. Total expected annual losses from earthquakes and cyclone wind damage alone amount to US$180 billion a year; and global annual losses from wild-land fires in the tropics will potentially reach US$190 billion a year. The UN International Strategy for Disaster Reduction believes that direct disaster losses are at least 50 per cent higher than internationally reported and its 'wake-up call' for 2013 is that disasters are even costlier than we thought (UNISDR, 2013).

It has long been accepted that poor people in poor countries are the most likely to experience an extreme weather event as a 'disaster', due to poor infrastructure, overloaded health and emergency services, existing environmental degradation and the land shortages that often force the poorest people to live in hazardous, disaster-prone places (Abramovitz, 2001).But the old poor-rich distinctions are starting to break down as disasters hit some of the richest countries in the world: the Japanese tsunami, Hurricane Katrina in the United States and escalating, catastrophic fires in Australia have proven to be no respecters of socio-economic privilege. The Japanese Toyota company lost US$1.2 billion in product revenue after the 2011 earthquake and tsunami. Losses can be long-term or permanent; prior to the 1995 earthquake in Japan, Kobe was the world's sixth largest port, but despite massive investment to repair damage it never recovered its previous regional dominance and had fallen to 47th place in the world by 2010 (UNISDR, 2013).

Disaster risks include the loss of natural capital in terms of healthy ecosystems, species and benefits foregone. Many countries are caught in a vicious cycle: environmental degradation reduces the ability of

ecosystems to withstand natural hazards, which in turn causes further environmental degradation, and so on. The slow slide into large-scale desertification is a prime example, but damage to coastal vegetation and reefs, losses of riparian forests and disruption of natural floodplains are all too common in many countries, rich and poor.

Responding to disasters requires a fundamental rethinking of priorities, both amongst those at risk and from governments and industry charged with the responsibility of minimising both the risks of disasters and the likely scale of the consequences. Here we are concerned with one element that we consider to have been poorly recognised and under-exploited to date: the value of natural ecosystems in protecting against and mitigating from disasters and the role of protected areas in maintaining these ecosystem services.

While many communities have traditionally used natural ecosystems such as forests, coral reefs and natural dryland vegetation to protect themselves against the impacts of natural hazardsfrom climate extremes and earth movements, larger numbers of people are now left exposed because environmental degradation has exposed people to increased levels of risk. Reversing these trends is now recognised as an urgent priority. Protected areas provide one of the world's most effective mechanisms for maintaining natural habitats and ecosystem functions. After decades in which engineering solutions were automatically the first choice for minimising the risk of disasters such as flooding and avalanches, the importance of protecting ecosystems is increasingly being recognised.

Protected areas provide four main benefits:

- Maintaining natural ecosystems that buffer against hazards such as tidal surge (coastal mangroves, coral reefs); flash floods(wetlands, floodplains); landslides (forests and other native vegetation; and dust storms and desertification (natural vegetation cover in drylands).
- Maintaining traditional cultural ecosystems and crops in protected landscapes (IUCN category V protected areas) that have an important role in mitigating extreme weather events, such as agroforestry systems, terraced crop-growing and fruit tree forests in arid lands that can prevent desertification.
- Providing a controlled environment for active or natural restoration of degraded ecosystems, such as reforesting steep slopes or restoring flood plains, providing both benefits to biodiversity and disaster mitigation benefits.
- Providing emergency sources of food, freshwater, building materials and living space following disasters, from protected areas where some level of sustainable off-take is allowed (e.g., IUCN protected area category VI sustainable use areas) (Stolton et al, 2008).

These benefits are increasingly being recognised, although resistance from more traditional agencies hampers progress. In 2011, UNISDR wrote "the monetary undervaluation of ecosystem services remains an important obstacle to the adoption of ecosystem-based DRM. As a consequence, relatively few countries are taking advantage of tools such as 'payments for ecosystem services". When politicians consider adaptation to challenges such as climate change they often still instinctively look to dams and levees for water storage and flood control and more investment in coastal defences such as sea walls, rather than restoration of natural floodplains and planting of mangrove forests in coastal regions. Civil servants making decisions about DRR may well belong to different ministries than those working on nature protection and the former may not understand the potential of ecosystem services. They will also be lobbied by powerful business interests who would profit from engineering solutions. Natural conservatism probably plays a role too. After the devastating effects of Hurricane Katrina in New Orleans in 2005, the need for restoration of floodplain forests and wetlands was widely recognised, but still had to compete with pressures to continue developing the bayous.

The role of protected areas can also be strengthened by integrating them more thoroughly into existing DRR planning, for example by:

- **Rigorous economic, engineering and environmental analyses**: of proposed infrastructure projects to determine when and where there are benefits of incorporating green infrastructure versus hard infrastructure into disaster reduction plans.
- **Broadscale spatial planning**: cooperation by disaster relief agencies at a national and regional/ transboundary scale to identify places where natural ecosystems could prevent and mitigate disasters and to develop associated ecosystem protection strategies. This can include where appropriate the establishment of new protected areas to safeguard ecosystem services that buffer communities.
- **Management plans**: some protected area authorities may consider revising management objectives and management plans in order to maximise benefits in terms of disaster mitigation and

to increase awareness of these values among the general public. Such revisions should not be at the expense of the biodiversity and ecosystems functions for which the protected area was established.

- **Payment for ecosystem services and financing strategies**: disaster risk reduction institutions could work with protected area managers to develop innovative financing strategies for protected areas, which recognise payment for ecosystem services. (DRR funds should in some cases be used to establish or manage protected areas in places where these provide cost effective DRR.)
- **Restoration**: in some cases it may be useful to protect and restore degraded ecosystems specifically to improve their role in disaster mitigation; in such situations some level of active management may be required, e.g. removal of invasive alien species to allow natural regeneration or planting of native species to restore natural processes.
- **Training**: protected area managers and rangers are often some of the few government officials in remote areas; additional training specifically on DRR issues allows them to help communities both through management options within the protected area and relief management if an extreme event takes place.

Local people contributed ideas for the new Sanriku Fukko National Park in Japan © Ministry of the Environment

DDR IN ASIA

The Asia Parks Congress in late 2013 is probably the first protected area conference to focus attention particularly on the role of protected areas in DRR, building consciously on experience during the 2011 tsunami. Coasts protected by natural ecosystems suffered less damage than those without such barriers and the government has reacted by highlighting the role of ecosystem services and developing a new national park in the region of the disaster, which serves both as a protection against future events and a memorial for those who lost their lives (see box).

BOX: THE NEW SANRIKU FUKKO NATIONAL PARK

The Great East Japan Earthquake had a substantial impact on the natural environment along the coast, and did extensive damage to facilities (paths, toilets, campsites, etc.) in the Rikuchu Kaigan National Park and many other natural parks. This coastline is known as the Sanriku coast, and includes many areas that have been designated natural parks because of their wonderful scenery.

Working on the principle of using reconstruction to restore connections between forests, satoyama (protected landscapes), rivers, and sea, the Ministry of the Environment decided to restructure this series of parks into a single park—the Sanriku Fukko National Park—and use it as a basis for green reconstruction, thereby stimulating local tourism, agriculture, forestry and fisheries ('Fukko' is a Japanese word for reconstruction).

An integral part of this plan was to incorporate the Tanesashi Kaigan Hashikamidake Prefectural Natural Park into the Rikuchu Kaigan National Park. The former includes Kabushima, famed as a breeding ground for black-tailed gulls (*Larus crassirostris*), and the Tanesashi coast with its beautiful coastal grassland scenery. The parks were officially joined in May 2013, and redesignated the Sanriku Fukko National Park (see Figure 1 and Figure 2 overleaf).

Monitors walked the whole proposed Michinoku Coastal trail © Ministry of the Environment

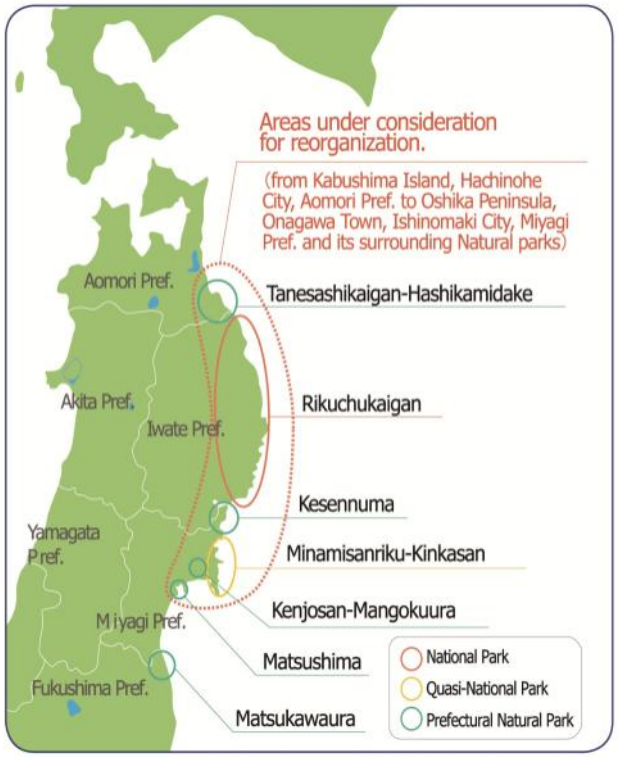

Figure 1: Map of the reorganization of natural parks. Source: Ministry of the Environment

RECONSTRUCTION ACTIVITIES

Initial management activities have included:

- **Michinoku Coastal Trail - a path bringing north and south together**: The Ministry of the Environment has been working with local municipalities on preparations for the Michinoku Coastal Trail. This is a long-distance path that is expected to become a symbol of reconstruction through the various connections that it makes, linking the local natural environment and people's lives, traces of disaster, the people who use the trail, and the people who live along it. To survey the best course for the trail, monitors walked the envisaged routes and discovered the attractions of each locality.
- **Repair and reconstruction of damaged facilities**: Repair and reconstruction of damaged facilities at some of the most-used parts of the Sanriku Fukko National Park, such as Jodogahama (a beach in Miyako, Iwate) and Kesennuma Oshima (an island in Kesennuma, Miyagi) are proceeding in collaboration with the local authority, contributing to reconstruction of the area. At Anegasaki cape (Miyako, Iwate), there are plans to preserve part of the damaged park facilities unrepaired, creating a venue for learning about how dangerous nature can be.

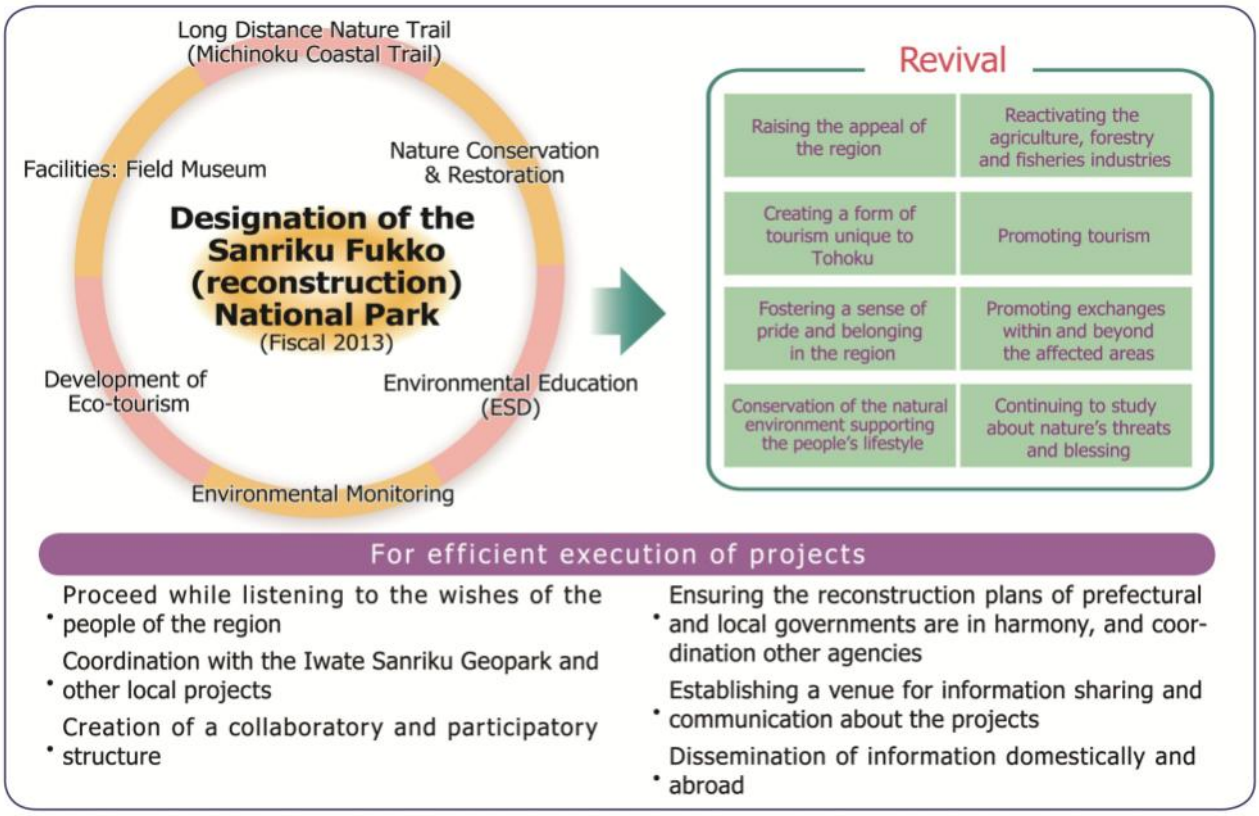

Figure 2: Green reconstruction centered on creating the Sanriku Fukko National Park. Source: Ministry of the Environment

Sanriku Fukko National Park, Japan © Ministry of the Environment

COMMUNICATING TO AN INTERNATIONAL AUDIENCE

The Sanriku Fukko National Park idea has attracted substantial international attention when introduced at international venues such as the Preliminary Asia Parks Congress in Tokyo in November 2011 and the IUCN World Conservation Congress, Jeju, Korea in September 2012.

Further presentations and updates are planned for the first Asia Parks Congress in Sendai, Japan in November 2013. By broadcasting this information internationally, we hope that the initiative will become an international model for the role that conservation policies have to play in recovery from a disaster.

In 2014, the World Parks Congress will also have a particular theme on protected areas and DRR. Then in 2015, the global community will be agreeing its next ten year strategy for international disaster risk reduction at the 3rd UN World Conference on Disaster Risk Reduction in Sendai, Japan. These sequence of events provide an opportunity to raise the profile of protected areas as tools for disaster risk reduction and provide more complete guidance to park managers, governments and other stakeholders about how such benefits can be maximised.

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ABOUT THE AUTHORS

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Nakanohama Campsite which will be utilized as a venue for learning how dangerous nature can be © Ministry of the Environment

Naoya Furuta is a IUCN Senior Project Officer with IUCN project office in Japan working on DDR issues at the Asian Parks Congress and World Parks Congress.

Nigel Dudley is WCPA vice chair for natural solutions and co-author (with Sue Stolton and Jon Randall) of the report *Natural Security: Protected Areas and Disaster Mitigation*, published by WWF in 2008.

Nobukazu Naniwa is in charge of management planning for national parks throughout Japan, including the Sanriku Fukko National Park. In 2005 he joined the Ministry of the Environment of Japan (MOEJ), where he started his career in environmental administration at Biodiversity Policy Division. After being engaged in efforts for the conservation of natural environments at Hokkaido Regional Environment Office and Manza Ranger Office, and for the conservation of threatened species at Wildlife Division through revisions of the Red-List, for example, he has been appointed as an Assistant Director at National Parks Division of MOEJ since May 2013.

Radhika Murti is the Programme Coordinator for nature based solutions to disaster risk reduction (DRR) at IUCN's headquarters. Radhika works with IUCN offices and members around the world to implement pilot projects in ecosystem based DRR, develop national and local capacities for policy makers and collaborates with universities/research institutes to collate scientific evidence on the role of nature in DRR. Additionally, Radhika also acts as the focal point for IUCN's engagement with Hyogo Framework for Action processes and works with relevant thematic programmes to promote integration of DRR and climate change adaptation strategies.

RESUMEN

Los costos de las tormentas, inundaciones, terremotos, deslizamientos de tierra, marejadas y la desertificación están aumentando; y con cada evento también se pierde capital natural en términos de ecosistemas saludables, especies y servicios de los ecosistemas. A pesar del aumento de la inversión en estrategias para la reducción del riesgo de desastres (RRD), más de un millón de personas murieron en la última década como resultado de desastres naturales. Es preciso replantearnos cómo debemos gestionar la RRD. Una estrategia poco reconocida y desaprovechada hasta la fecha es la función de los ecosistemas naturales en la protección contra los desastres y la mitigación de sus efectos y el papel de las áreas protegidas en el mantenimiento de estos servicios de los ecosistemas. Este editorial analiza cómo pueden las áreas protegidas apoyar la RRD y se basa específicamente en las reacciones al gran terremoto que sacudió el este de Japón en 2011.

RÉSUMÉ

Les coûts économiques associés aux tempêtes, inondations, tremblements de terre, glissements de terrain, à la montée des océans et à la désertification sont en augmentation, et à chaque événement le capital naturel est également perdu en termes de santé des écosystèmes, des espèces et des services écosystémiques. Malgré l'augmentation des dépenses liées à la réduction des risques de catastrophe (RRC), plus d'un million de personnes ont péri à la suite de catastrophes naturelles au cours de la dernière décennie. Nous devons repenser la manière de gérer la RRC. L'un des stratégies mal reconnues et sous-exploitées à ce jour est le rôle des écosystèmes naturels dans la protection contre les catastrophes et pour leur atténuation, et l'implication des aires protégées dans le maintien de ces services écosystémiques. L'éditorial suivant examine comment les aires protégées peuvent soutenir la RRC, et s'appuie notamment sur les réponses au violent séisme et tsunami de 2011 dans l'est du Japon.