

# Building Back Better: A More Resilient Sikkim Post 2011 Earthquake

Photo: AIDMI

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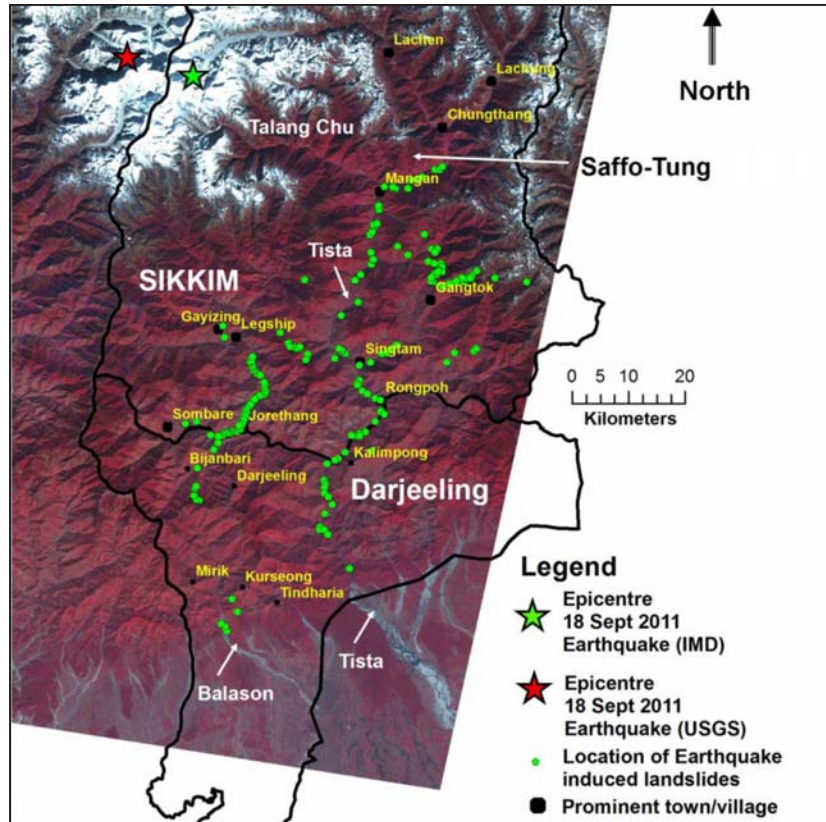
## Two Years after the Sikkim Earthquake: Important Lessons Learnt

After the Sikkim earthquake of 2011, a lot of institutional and academic reports have been published that shed important light on the some very important facts about the earthquake. These reports also give insight into some of the unique features of this disaster and the lessons that can be drawn from this disaster.

The general information known about the earthquake is as follows: An earthquake measuring 6.9 on the Richter scale struck near the Sikkim-Nepal border on September 18, 2011. The earthquake triggered a large number of landslides and caused significant damage to buildings and infrastructure. Sikkim was the most affected state in India, followed by West Bengal and Bihar. Neighbouring countries of Nepal, Bhutan, Tibet (China) and Bangladesh sustained damage and losses to varying extent<sup>1</sup>. There were three aftershocks 5.7, 5.1 and 4.6 on the Richter scale that were experienced after 75 minutes of the main earthquake.

The consequent landslides, rock falls and mud slides were mainly responsible for the loss of life and damage to property. The total loss of life in India is reported to be 78, 60 in Sikkim, and the rest in West Bengal and Bihar. The total loss has been estimated at around US \$500 million<sup>2</sup>. The map shows the area affected by the disaster<sup>3</sup>.

In the wake of the earthquake, Prime Minister Dr. Manmohan Singh



announced Rs. 1,000 will be provided to Sikkim as financial assistance for relief and rehabilitation. In response to this earthquake, the Sikkim government had distributed Rs. 14.21 crore as relief among the quake hit people. The state government opened close to 85 relief camps and carried out several rescue operations<sup>4</sup>.

It is important to mention that there some reports suggest that moderate to heavy rainfall prior to the earthquake was responsible for exacerbating the landslide and

rockslide situation<sup>5</sup>. The damage caused by these landslides, mudslides and rock slides has been effectively documented. The table alongside showing reveals the damage caused to houses by the earthquake<sup>6</sup>.

**The main reasons for the damage to structures due to the earthquake are discussed below<sup>7</sup>:**

- Many dramatic building collapses and damages to structures, disproportionate to the observed intensity of shaking were primarily caused due to faulty construction practices and poor compliance with seismic codes.
- Many unique and inherently poor construction features such as weak and very slender partition walls in brick/block masonry or in lightly reinforced/plain concrete, construction on

| District | Houses damaged (Sikkim) |               |                |              |
|----------|-------------------------|---------------|----------------|--------------|
|          | Fully damaged           | Severe damage | Partial damage | Minor damage |
| North    | 6000                    | -             | -              | -            |
| South    | 820                     | -             | 446            | 1582         |
| East     | 6000                    | -             | 9000           | -            |
| West     | 1679                    | 5327          | 8342           | -            |
| Total    | 14499                   | 5327          | 17788          | 1582         |

sloped ground, unstable slopes, weak retaining walls, etc., significantly add to the seismic vulnerability of structures.

- The traditional houses like Shee-Khim and Ikra performed well as expected as they evenly distribute the deformation which adds to energy dissipation capacity of the system.

**Similarly, the main recommendations made in these reports are as follows:**

- Sikkim does not presently have an airfield. The absence of an airfield was acutely felt in the 2011 earthquake. An airfield should be there in Sikkim as it would help in future disaster management process.
- The state of Sikkim should have disaster management plans at all administrative units right from the state level to the block level. This would greatly add to the

preparedness level of the state for future disasters.

- The state of Sikkim would benefit immensely if community awareness drives on disaster preparedness and mitigation measures are undertaken in the state. These drives will not only help raise the awareness of the local populace in the area but it would also help in making them self dependent in responding to disasters.
- The earthquake of 2011 and the consequent devastation has highlighted the urgent need to

have structural audits in the major cities of Sikkim. These audits would reveal the weaknesses of the present structures in the state so that with appropriate rectifications such weak structures can be made resilient.

• There is an urgent need to take up school safety campaigns in the state in a concerted manner. This is because in the earthquake of 2011 Out of the 779 schools in the State, 682 school buildings collapsed/damaged, which means that 80 per cent of the school buildings were affected<sup>8</sup>. ■

- 1 [https://www.eeri.org/wp-content/uploads/Sikkim-EQ-report-FINAL\\_03-08.pdf](https://www.eeri.org/wp-content/uploads/Sikkim-EQ-report-FINAL_03-08.pdf)
- 2 [http://www.portal.gsi.gov.in/gsiDoc/pub/report\\_portal\\_final\\_20102011.pdf](http://www.portal.gsi.gov.in/gsiDoc/pub/report_portal_final_20102011.pdf)
- 3 [http://www.portal.gsi.gov.in/gsiDoc/pub/report\\_portal\\_final\\_20102011.pdf](http://www.portal.gsi.gov.in/gsiDoc/pub/report_portal_final_20102011.pdf)
- 4 Very strong damaging earthquake in the Nepal / Sikkim (India) border area + updates <http://earthquake-report.com/2011/09/18/very-strong-earthquake-in-sikkim-india/>
- 5 [http://www.portal.gsi.gov.in/gsiDoc/pub/report\\_portal\\_final\\_20102011.pdf](http://www.portal.gsi.gov.in/gsiDoc/pub/report_portal_final_20102011.pdf)
- 6 <http://www.ifrc.org/docs/appeals/11/MDRIN008drefFR.pdf>
- 7 [http://www.nicee.org/Sikkim\\_EQ\\_2011\\_Slide.pdf](http://www.nicee.org/Sikkim_EQ_2011_Slide.pdf)
- 8 [http://idsa.in/system/files/jds\\_6\\_1\\_KhannaVermaKhanna.pdf](http://idsa.in/system/files/jds_6_1_KhannaVermaKhanna.pdf)

### List of Selected Reports on Sikkim Earthquake of 2011

| Sr. No. | Name of the Report   | Author/Authors   | Organization   | Date of Publication |
|---------|--|--|--|---------------------|
| 1.      | DREF Final Report India: Sikkim Earthquake   | The International Federation of Red Cross and Red Crescent (IFRC)            | The International Federation of Red Cross and Red Crescent (IFRC)                            | 29 May, 2012        |
| 2.      | Earthquake induced landslides in the Sikkim-Darjeeling Himalayas – An aftermath of the 18th September 2011 Sikkim earthquake | Indranil Chakraborty, Dr. Saibal Ghosh, Debasish Bhattacharya and Anjan Bora | Engineering Geology Division Geological Survey of India Eastern Region Kolkata               | -                   |
| 3.      | Sikkim Earthquake of 18th September, 2011: A Report  | Disaster Mitigation and Management Centre                                    | Department of Disaster Management, Govt. of Uttarakhand)                                     | January 2012        |
| 4.      | 2011 Sikkim Earthquake: Effects on Built Environment and A Perspective on Growing Seismic Risk                               | Durgesh C. Rai, Goutam Mondal, Vaibhav Singhal, Neha Parool, Tripti Pradhan  | National Information Center on Earthquake Engineering, Indian Institute of Technology Kanpur | 22 October, 2011    |
| 5.      | Earthquake Damage Assessment - Vulnerability of Sikkim's Built Heritage  | Rhena Tessmann   | INTACH – Indian National Trust for Arts and Cultural Heritage                                | March 2012          |
| 6.      | Sikkim Earthquake India: Situation Report No. 3 , 22 September 2011  | UN OCHA  | UN OCHA  | 22 September, 2013  |
| 7.      | Sikkim Earthquake: SEEDS Early Recovery Plan: Recovering Critical Lifeline structure   | SEEDS  | SEEDS  | 23 September, 2011  |
| 8.      | The Mw 6.9 Sikkim-Nepal Border Earthquake of September 18, 2011  | EEERI  | EEERI  | February 2012       |
| 9.      | Annual report: Disaster Relief Emergency Fund (DREF)   | IFRC   | IFRC   | April 2012          |
| 10.     | Sikkim Earthquake: Perils of Poor Preparedness   | Nina Khanna, Jayender Verma, and B.K. Khanna                                 | Institute for Defence Studies and Analyses   | January 2012        |

# AIDMI and the Sikkim Earthquake 2011

The All India Disaster Mitigation Institute (AIDMI) was one of the first non-government agencies to respond to the earthquake which rocked Sikkim on September 18, 2013. The work undertaken by AIDMI in Sikkim was under the project titled 'Sikkim Earthquake 2011: Identifying and Pilot Addressing to Local Needs'.

The following is a list of achievements of objectives of the project carried out by AIDMI:

| Sr. No. | Objective   | Achievement  | Output   | Involved stakeholders   |
|---------|---|--|--|---|
| 1       | Direct basic and immediate relief of livelihood tools through cash for work for livelihood                        | <ul style="list-style-type: none"> <li>02 groups comprising of 22 women members have started economic recovery through re-establishing their group livelihood activities and selling products out of it.</li> <li>One of the two women groups has won a prize at the recently concluded state level congregation at Singtham, East Sikkim district in recognition of quality and variety of their products (candles).</li> </ul> | <ul style="list-style-type: none"> <li>Photographs of women SHGs in a) photo documentation of pilot phase activities, and b) Monitoring visit report</li> <li>Covered 02 SHGs also listed in SHGs covered during joint needs assessment</li> </ul> | AIDMI has facilitated NDMA, Sikkim State Disaster Management Authority (SSDMA), local administration, village leaders, local suppliers, and community leaders while providing livelihood support to two women-led SHGs as against target of pilot one group all together. |
| 2       | To develop basic conditions for local capacity based long term community recovery and risk reduction led by women | <ul style="list-style-type: none"> <li>The structural work in an affected school included repairing of classrooms, corridors, nursery class, school children's wash room, staff room, hostel washroom and recreation room.</li> <li>School administration also mobilised its own resources to cover all the major repairs in the affected school</li> </ul>  | <ul style="list-style-type: none"> <li>List of schools covered during joint needs assessment</li> <li>Photographs of the school in photo documentation of pilot phase activities, and b) Monitoring visit report</li> </ul>                        | NDMA, SSDMA, local administration, school administration and staff, local suppliers, local skilled and un-skilled labours.  |

These activities that were taken up by AIDMI in Sikkim are completely attuned to the priorities set up NDMA and the people of the state. For instance, NDMA accords a lot of importance to capacity building of the local populace of an area for preparedness and mitigation purposes. Similarly, AIDMI has strived to empower the community on the aforementioned aspects by undertaking capacity building exercises.



A man can effectively lead livelihood recovery in Sikkim.



Mr. B. K. Khanna of NDMA with student at North Sikkim Academy, Mangen, Sikkim.

Until unless specified all photographs of this publication are by AIDMI.



# Summary Analysis Sikkim State Disaster Management Plan 2010-2011

The Sikkim State disaster Management plan of 2010-2011 is a very relevant document. It provides a lot of details on various aspects associated with disaster management in the state. However, there are certain pros and cons that this has.

The pros of the plan are as follows:

**1. Extensive information on issues covered**

The plan provides a lot of details on the issues that it covers. These details are supplemented by maps. There are a lot of maps that are provided in this plan. For instance, in the introductory part there are four to five different types of maps that are provided to give the reader an idea of the geological features of different parts of Sikkim

**2. The inclusion of Endangered Species in the Plan**

A very important aspect of the plan is that it provides a lot of information on endangered species of flora and fauna in the state. These have been described in detail. This is something new that has seldom been observed before.

**3. Vision of the plan is articulate**

The state disaster management plan consists of the vision of the plan. This is something not very prevalent. It builds an effective base to understand the objectives of the plan.

**4. Detailed Hazard, Vulnerability, Capacity Assessment**

The plan has a very detailed and meticulous Hazard, Vulnerability and Capacity Assessment (HVCA) section. It lists out the various kinds of vulnerabilities in terms of natural, man-made,



*Shelters are the worst hit and need multi-hazard resilience in reconstruction planning.*

etc. A detailed HVCA is extremely important in understanding the risks posed by various disasters to the state. The HVCA of Sikkim State Disaster Management Plan achieves this end effectively.

The cons of the plan are as follows:

**1. The lack of provisions for integration of Climate Change Adaptation and Disaster Risk Reduction**

The plan has no provisions for the integration of Climate Change Adaptation and Disaster Risk Reduction. Since, climate change has known to be responsible for increasing the frequency and intensity of disasters, therefore, disaster management plans should necessarily have an aspect of climate change factored into them.

**2. Greater integration of SDMP with other welfare schemes**

There needs to be a greater integration of the disaster management plans with other

welfare schemes in the state. The integration of these welfare schemes would promote a more coordinated cluster approach. This would lead to greater coordination.

**3. Lack of key provisions for female participation**

The plan does not adequately focus upon the need to promote the participation of women and girl child in the framing, drafting and implementation process. There is thus a need to make the plan for gender sensitive.

**4. The importance of traditional knowledge ignored**

Traditional knowledge structures have been sidelined in the plan. It is known that local knowledge best solves local challenges. Thus, there is a need to have more local knowledge systems in the plan to address this issue.

Thus, the plan has a fair number of pros and cons. By improving upon the shortcomings the plan can be considerably improved. ■

# Getting Climate Smart for Disasters in Sikkim

The Climate Smart Disaster Risk Management (CSDRM) approach has been developed by the Institute of Development Studies (IDS) in consultation with 500 academics and practitioners of the disaster management community in 2010. The CSDRM approach offers a new perspective to disaster management. Hitherto, the areas of climate change, disaster risk reduction and overall development were seen as separate entities in the humanitarian sector working in isolation. But the CSDRM approach posits that these entities work together or are influenced by one another to effect overall humanitarian outcomes. Development, Climate Change Adaptation and Disaster Risk Reduction should be visualized as cogs of a machinery to effect humanitarian outcomes. The diagram shows this working.

A greater integration is needed between Climate Change Adaptation and Disaster Risk Reduction in Sikkim. The CSDRM approach is best suited to achieve this aim. The tool used by the CSDRM approach is the 'Self-Assessment Tool' which it offers to organizations to assess their degree of integration of disaster risk reduction and climate change adaptation.

The United Nations International Strategy for Disaster Risk Reduction (UNISDR) has also recognized the importance of the CSDRM approach. In a policy forum dating back to October 2009, the UNISDR posited the



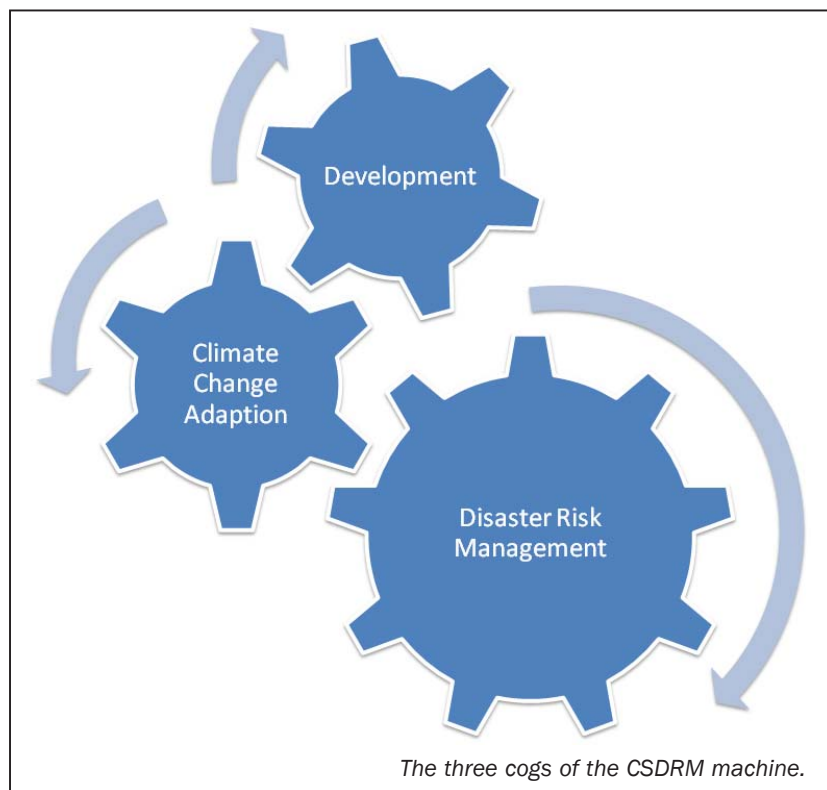
*Climate change can have adverse effects on Sikkim's vegetable production.*

importance of this approach and pledged to take this approach further.

The All India Disaster Mitigation Institute (AIDMI) has been an active

participant in promoting the CSDRM approach. It has organized workshops in Odisha for the development of the self-assessment tool for CSDRM and has facilitated the self-assessment of an organization called Society for Women Action and Development (SWAD).

The devastation of the Uttarakhand floods of 2013 aptly shows how climate change in the form of unexpected cloudbursts and torrential rains resulted in a disaster. Thus, it is imperative that Sikkim should adopt this CSDRM approach to better equip its disaster management structure to respond to disasters. ■



# Lessons of Preparedness from Uttarakhand to Sikkim

The tragedy of the Uttarakhand flash floods of June 2013 has been seared forever in our nation's collective consciousness. The death and devastation that was witnessed in Uttarakhand has been recorded by many experts to be hitherto unprecedented in the state's history. However, there are certain lessons that the tragedy in Uttarakhand can offer to states like Sikkim.

Since both Uttarakhand and Sikkim are hilly states, therefore some parallels in terms of the level of disaster preparedness can be drawn between. There is an overwhelming majority of informed scientific opinion that holds the view that the impact of a natural disaster like flood was exacerbated by indiscriminate human activity. Similarly, some reports have suggested that the devastation that resulted in the aftermath of the 2011 Sikkim earthquake was disproportionately bigger than it ought to have been because of unbridled human activity<sup>1</sup>.

This is a very disconcerting fact and if the disaster in Uttarakhand was a prelude of human activity compounded natural disasters then Sikkim should make itself more resilient by adopting some of the recommendations that were made for Uttarakhand after the devastating floods there. Some of these major lessons in preparedness are discussed below:

1. **The Need for properly trained State Disaster Response Force**  
The Uttarakhand tragedy aptly showcased the need to have a fully equipped and properly trained State Disaster Response Force (SDRF). The role of the army in the ensuing rescue and relief operations in Uttarakhand are known to all. However, in order

to make the state self-reliant in response and recovery, the SDRF should be properly trained and fully equipped. Sikkim should thus strive for having an up to date and fully functional SDRF. Some steps towards this were taken in the immediate aftermath of the floods<sup>2</sup>.

2. **Urgent Need for Capacity Building of the Community**

The community remains the weakest link in all disasters and there is a necessity to train and equip young volunteers so that in the eventuality of roads being destroyed or adverse weather hampering air operations (as was the case both in North Sikkim, after the quake and recently in Uttarakhand), people in remote areas may still survive till help reaches. This calls for a massive capacity building exercise at the community level that can make prepare the community to face any contingency<sup>3</sup>.

3. **Tailor New Development Approaches to the Local Context**

There is an urgent need to study, specify and strictly implement what exactly 'new ways of development, development that is protected from disaster risk, development that is climate smart—green and clean—in the long run' means in the Himalayan region. A knee-jerk reaction as is being seen in the aftermath of this horrific tragedy

may soon be forgotten if the next two or three years are disaster free. There is thus a need in states like Sikkim and Uttarakhand to have development approaches suited to their local context and needs.

4. **Integration of Disaster Risk Reduction with Climate Change Adaptation for Effective Relief Strategy**

Climate change has increasingly been come to be viewed as compounding the adverse effects of disasters. In this respect, any new approaches that are built to combat the adverse impacts of disasters should necessarily subsume the integration of Disaster Risk Reduction with Climate Change Adaptation. This integration has to take place in Sikkim to impart sustainability to effective disaster risk reduction practices<sup>4</sup>.

5. **Promotion of Livelihood Resilience**

In Sikkim just as everywhere, disasters cause the maximum damage to people and communities that are economically vulnerable. The most obvious way to reduce this vulnerability is to focus on and promote livelihood promotion activities in all the phases of the disaster management cycle<sup>5</sup>. Thus, livelihood promotion should be a very important area of concern. ■

1 [http://www.nicee.org/Sikkim\\_EQ\\_2011\\_Slide.pdf](http://www.nicee.org/Sikkim_EQ_2011_Slide.pdf)

2 CM Announces SDRF Formation. <http://www.dailypioneer.com/state-editions/dehradun/cm-announces-sdrf-formation.html>

3 Floods in Uttarakhand: A New Relief Deal, Real-time Capacity Building in Uttarakhand. <http://reliefweb.int/sites/reliefweb.int/files/resources/95%20Snet%20Uttarakhand%20Floods.pdf>

4 Disaster and Climate Resilience Across the Eastern Himalayas. <http://cdkn.org/project/linking-drr-cca-and-sustainable-landscape-development-goals-in-the-eastern-himalaya/>

5 Early Recovery By UNDP-What It Means To Uttarakhand. <http://chimalaya.org/2013/07/29/early-recovery-by-undp-what-it-means-to-uttarakhand/>



# Managing Disaster Debris

Disaster Debris Management is increasingly recognized as an integral part of post-disaster recovery plan worldwide. Debris removal following a major disaster situation is a major challenge in any emergency response and recovery operation and usually is insufficiently addressed by humanitarian response agencies. Before any recovery can begin, the debris from the disaster must be cleared and either removed or re-used.

Relief and reconstruction efforts can be hindered when disaster waste blocks access to affected populations and areas. Disasters can generate large quantities of solid waste that threaten public health, delay reconstruction, and impact the environment. Disaster waste also presents opportunities: it may contain valuable material such as concrete, steel, and timber, as well as organics for composting. This value can be realized as either a source of income or as a reconstruction material and can reduce burdens on natural resources that might otherwise be harvested for reconstruction. Safe handling, removal, and management of debris are, therefore, important issues in disaster response and recovery. Unfortunately, current disaster waste management practice often involves either inaction, in which the waste is left to accumulate and decompose, or improper action, in which the waste is removed and dumped in an uncontrolled manner. In the latter case, improper dumping may create long-term environmental problems that affect the

community or occur on economically significant land, requiring waste be moved again and generating additional costs. National authorities assume the primary responsibility for dealing with debris removal, but they are often overwhelmed during disasters with rarely any type of international assistance to provide support.

Large volumes of debris generated post natural disasters is evident from the recent Uttarakhand disaster where debris severely impacted emergency response, impeded rescuers and emergency services reaching survivors.

Coastline tsunamis are globally known for generating massive debris volumes in millions of cubic metres that severely hamper recovery and rebuilding efforts. However, the Uttarakhand Disaster was an equivalent 'Himalayan Tsunami' severely exacerbated by a lack of access as roads that are critical for supply routes were clogged by mountains of debris. Complexities of altitude featuring unapproachability with harsh weather conditions and telecommunication issues added on to the list of challenges faced. Disaster

debris management quickly became one of the most significant issues facing disaster responders. Slow-paced recovery and rebuilding efforts are assured given the difficulty of mobilising debris removal equipment to affected areas.

Countries and humanitarian agencies need to increasingly pursue stronger debris management preparedness and response practices. By better understanding more fully the critical role that debris management plays in disaster recovery, better strategies for preparing and responding to a high debris volume disaster event can be identified.

Lessons Learnt Exercises (LLEs) led by national, state and local authorities that incorporate debris management scenarios can assist in preparedness planning while framing proactive disaster risk management policies.

There is also a current need for a post-disaster recovery planning forum to develop work plans that proactively address key issues, such as debris management, and build resilience. Similarly, discussing strategies and coordinating with organisations on a one-to-one basis facilitates greater understanding of the strategy ensuring endorsement of all stakeholders be it the local, city, state or national agencies. Last but not the least; the dissemination of evolved strategies to tackle post-disaster recovery processes should be published and incorporated into the public domain. ■

**– Langdon Greenhalgh**  
Managing Director,  
Global Emergency Group



The Hindu.



# G20 Summit – A Missed Agenda?



An open meeting of the drafting committee discusses the address to the leaders and the final documents of the Civil20 Summit. Day Two. (source: <http://www.g20.org/photo/20130614/781432389.html>)

It would be difficult to argue with the agenda of the G20 held in early September in Russia. After all, everyone demands sustainable, inclusive, and balanced growth. And everyone demands the creation of millions of new jobs worldwide. Perhaps in this phase of a financial slow down, the top policy makers are in rare harmony with what the citizens want. In reality perhaps geopolitics overshadowed progress on many of the agenda points.

However, what was missing from both the agenda and the discussions was a focus on risk and resilience: reducing risk of climate change and natural hazards and building resilience of livelihoods of the poor and vulnerable. Somehow, the G20 leaders seem to assume our future will be free from disasters and extreme climate events.

And this is odd. Because, since the last G20 Summit, almost each leader has dealt with one or more disasters and extreme climate events at home or internationally. The largest economies of the world face disaster risks now more than ever before. And yet none of the leaders have mentioned any type of risk or

resilience beyond the financial or economic at the summit.

In reality, climate change and disaster risk and development risk are highly connected. Let me draw from the discussion held at the recent meeting of the Climate and Development Knowledge Network's (CDKN) Disaster Risk Management Learning and Innovation Hub in Asia, on June 19-21, 2013 in Bangkok. The message from over 50 participants piloting innovative climate risk projects in Asia and the Pacific was that the framework for strong, sustainable, and balanced growth must include protection from natural disaster risks. The participants had piloted ways to reduce risk and build resilience across Asia and have the evidence to show that development is sustainable only if it considers these other types of risks.

While jobs and employment were discussed at the G20 Summit, there was hardly any thought given to the exposure of existing jobs to climate and disaster risks which threaten their existence, as well as the potential of creating new jobs by carrying out risk reduction activities in the hotspots of risk across the world. More and more jobs—formal and informal—in the

delta areas of Mahanadi, Brahmaputra, Ganges, high altitude settlements in Ladakh, Kashmir, and Sikkim, in the flood plains of Bihar in India, Chandragadi in Nepal and the Punjab in Pakistan, as well as elsewhere, are facing the risk of being lost. These jobs are mainly held by the poorest within the vulnerable communities of fishermen, coastal farmers, horticulturalists in hill areas and small holders in flood plains. Though scattered throughout the region, when added up the possible loss of livelihoods due to climate change and disaster risks over the next five years is often discussed to be from 3 to 20 million. Official data has yet to emerge from various ongoing research and policy initiatives. However, there are also examples of new jobs being created by investing in disaster risk reduction. In the Mahanadi Delta of Odisha, India, landless women are taking up nonfarm small businesses to diversify their income; so are women in the Mekong in South East Asia and Nile Deltas in Egypt. The G20 leaders should start demanding status paper on extreme event risks faced by livelihoods of the poor. The labour organizations such as International Labour Organisation (ILO) or

International Financial Institutions such as the World Bank can easily come up with such regular updates.

Take a look at energy sustainability. For some reason, energy security continues to remain a development 'issue' and not a disaster 'issue'. Not only is energy security facing the risk of disasters—floods and earthquakes in two thirds of hydropower establishments in Asia—but it is this very vulnerable energy that is needed to accelerate recovery after any disaster. Even accurate estimates on the risks faced by hydro-power structure are not publicly available. The resilience of energy security, at least energy security for the poorest sections the population in G20 countries, was certainly not on the G20 Summit agenda. Leading energy corporations such as Shell for example can be invited to offer such scenarios to next G20 Summit.

As the post-2015 development goals are being defined, 'Development for All' was on the G20 agenda. This agenda item also implicitly includes those at risk of disasters and those who are victims of disasters. But this is not enough anymore. What is needed is a 'Safer Development for All' vision. Safer not only in terms of

disasters and climate risk, but also in terms of income, assets and basic services of drinking water and sanitation.. The next G20 Summit must demand from United Nations Agencies such as United Nations Development Program (UNDP) reducing the risk and building resilience as cross cutting theme for revised development goals.

The international financial architecture and multilateral trade is always a priority for the G20 summits, but as always the G20 ignored the possible impact of a major disaster on not only the growth and flow of finance and trade, but also on the architecture itself. Some elements of this international financial architecture are in need of retrofitting such as enabling trade and commerce and small businesses to withstand financial shocks of natural disasters. Imagine the impact of a major earthquake in Greece or Portugal now! Or consider how major floods or droughts affect both local and international markets. International trade and finance needs a climate change and disaster resilience audit and the G20 Governments should start demanding such resilience audit from international financial and trade institutions. Fighting corruption is

also high on the agenda of the G20 leaders. Humanitarian crises are notorious for the corruption that arises due to poor accountability and inefficiencies in the system. Downward accountability to the victims, and lateral accountability to other authorities and donors needs greater supervision worldwide. Networks such as Active Learning Network for Accountability and Performance (ALNAP) in the UK have developed ways to address such lack of accountability. And as humanitarian crises escalate with extreme events, the possibility of corruption related to flood management, drought proofing, and cyclone shelter is something to look out for by the leaders.

So is there a single most important step our busy leaders can take at the next Summit to address the risks facing our world today? Is there a way ahead? The G20 would do well to take a timely and reflective look at the Hyogo Framework for Action (HFA), prepared by the International Strategy for Disaster Reduction (ISDR) and plan for a development course post 2015 that takes into account the range of vulnerabilities we face that will make the world a safer, better place for all. ■

– Mihir R. Bhatt

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#### KNOWLEDGE SHARING

## Riots in Uttar Pradesh: What Should National Integration Council Discuss

According to recent reports, the riots in Uttar Pradesh left 50 dead and 40,000 homeless<sup>1</sup>, and the socio economic fabric of society torn and burnt most severely. Riots are not new to India. Nor why riots happen. What is becoming a great concern is the fact that over past six decades India has hardly found a way to deal with the causes of riots and reduced them. What do we indeed know about riots in India?

We know that the worst affected in any riots are the poorest citizens. May it be religious riots or riots to protest for or against formation of new states or districts or caste related riots. It is the handloom weaver, *bidi* roller, casual construction labour, forest gum collector, farm hand, or *chiwalaha* who is worst affected. But why? Why mostly poor continue to suffer both, the economic and human insecurity during riots in India?

We know that after riots, poor food security and malnutrition continues over a fairly long time. Access to food and nutrition by the victims go down, worst affecting growing children and new mothers. Why our food distribution system, and food markets are not resilient to riots? Women suffer more and longer from the violence and its impact. Hardly any riot photo essay misses out

Environment degrades and natural resources are mismanaged after a riot

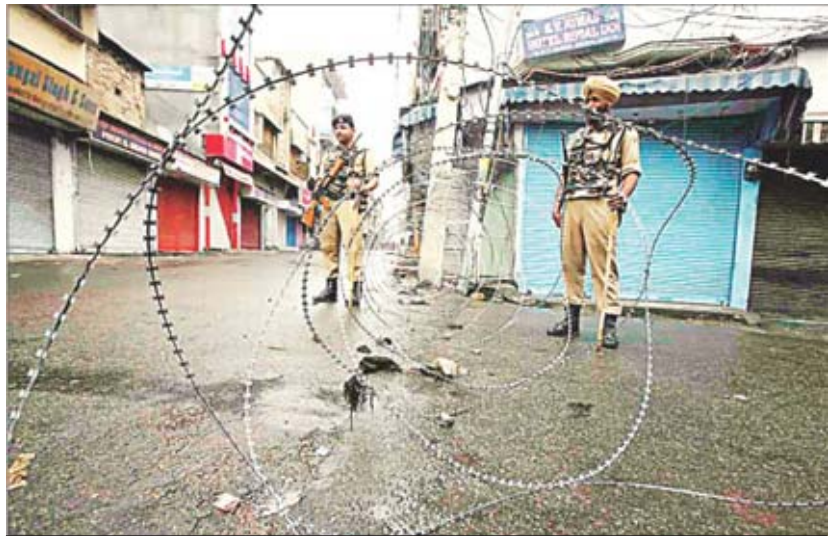


Photo: Naiduniya.

Accountable and responsible government in charge of riots recovery accelerates recovery. Ongoing research work of Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP) in United Kingdom on national authorities indicates learning and improvement by governments affected by humanitarian crises is unsystematic and not continues across countries. Though India has set up distinguished list of commissions of inquiries after riots over decades hardly any effort is made to learn what state governments have learned and improved from these reports and the processes. The Inter-State

None of the above points are new or original to anyone, and certainly not to the members of NIC. Time has come for NIC to go beyond "who caused these riots and how" to shape and strengthen different arenas of interventions in crisis to find long lasting and creative ways of reducing riots, ways that measure up to India's long tradition and rich cultural history of unity in diversity as well as upcoming but uncertain glory of economic growth. ■

– Mihir R. Bhatt

1 <http://www.ndtv.com/article/cheat-sheet/muzaffarnagar-riots-three-mlas-arrested-rajnath-singh-demands-president-s-rule-in-up-421621>



# Disaster Management and Mitigation Plan 2013

Department of Health and Family Welfare, Government of Odisha

The Department of Health and Family Welfare, Government of Odisha has come out with its own specific plan for disaster management and mitigation. This plan is aimed at furthering the welfare of families and children in particular during and post contingent times. The plan is very detailed and information oriented.

However, it can be said that the plan has some pros and some cons. The pros of the plan are as follows:

1. A detailed multi-hazard map of Odisha providing details of the vulnerability of the state to different types of disasters.
2. The plan mentions an extensive hazard and vulnerability mapping exercise within which the year, the nature of disaster, the entity, the stimulus and the outcome of various disasters has been expounded upon. It has been presented in the following format:

| Year | Nature of Disaster | Entity | Stimulus | Outcome |
|------|--------------------|--------|----------|---------|
|      |                    |        |          |         |
|      |                    |        |          |         |
|      |                    |        |          |         |

3. The plan also consists of a detailed disaster risk analysis which has been done in the following format:

| Sr. No. | Hazard/Disaster | Risk |
|---------|-----------------|------|
|         |                 |      |
|         |                 |      |
|         |                 |      |

4. The Plan consists of a concerted Preparedness section for 2013 which includes critical actions in the following areas:
  - a) Contingency plan for deployment of Medical/ Para Medical Staff from State HQ
  - b) Prepositioning of supplies
  - c) Health Education
5. The plan includes a mass casualty incident management plan that covers the following points:
  - a) Management at health facility level during disaster, on site and at the hospital
  - b) Uses of hospital during mass casualty incidents

- c) Hospital Evacuation Plans and Guidelines during disasters
6. The plan has a concerted and extensive section on Biological Hazard Specific Planning.
  7. The plan consists of a separate section on specific planning guidance during chemical disasters. This section identifies the following chemicals of concern and arranges them in the following categories:
    - a) Military agents
    - b) Pulmonary (lung damaging agents)
    - c) Irritants
    - d) Vomiting Agents
    - e) In capacity agents

The cons of the plan include the following:

1. The lack of objectives of the plan:  
This plan does not talk about the objectives of the plan. Without stating the objective or the purpose it becomes very difficult to assess what the plan seeks to achieve.
2. The lack of methodology used to develop the plan:  
There is no mention of the methodology that has been employed in drafting the plan. The methodology is an integral part of the plan and provides a rationale for the activities listed to be followed under the plan.
3. The plan does not provide guidelines for addressing the special needs of women and children:  
The plan has no guidelines for promoting the participation of either women or children in either the planning or implementation process. Providing such guidelines is essential for addressing the special needs and interests of these vulnerable demographic groups.
4. The absence of gender and age disaggregated data:  
The plan suffers from a lack of gender and age disaggregated data. Since such data is indispensable to gauge at the vulnerability of children and women in the total population, therefore gendered and age disaggregated data should be included in the plan.
5. The focus on the elderly completely missing:  
It is well known that the elderly just like children are most susceptible during contingent times. But this plan completely ignores their needs and interests. In order to make this plan more effective and inclusive the needs of the elderly need to be incorporated. ■

– Kshitij Gupta

## INFORMATION SHARING

# Protecting Asia's Coasts for People and Nature

Photo: AIDMI



**I**nternational Union for Conservation of Nature – IUCN Vice President Mr. Malik Amin Aslam Khan spoke about climate change related vulnerabilities in Asia and the need for a Global Mangroves Alliance at the 10th Regional Steering Committee Meeting of the Mangroves for the Future (MFF) Initiative held in Hoi An Viet Nam from 11 – 14 September 2013.

MFF is a regional initiative working to address climate change and developmental impacts on Asia's coasts and coastal dwellers. Started in 2007, the initiative works through National Coordinating Bodies in member countries to provide grants for local project delivery and other activities

building resilience of ecosystem-dependent coastal communities. The initiative is currently funded by SIDA, NORAD and Danida and is co-chaired by IUCN and UNDP. Current member countries include Bangladesh, India, Indonesia, Maldives, Pakistan, Seychelles, Sri Lanka, Thailand and Vietnam. ■

– Raj Kumar

Membership Manager, Asia, IUCN, Thailand

For more information:

<http://www.iucn.org/about/union/secretariat/offices/asia/?13662%2FProtecting-Asias-Coasts-for-People-and-Nature=>

## KNOWLEDGE SHARING

# The Significance of Traditional Knowledge Systems

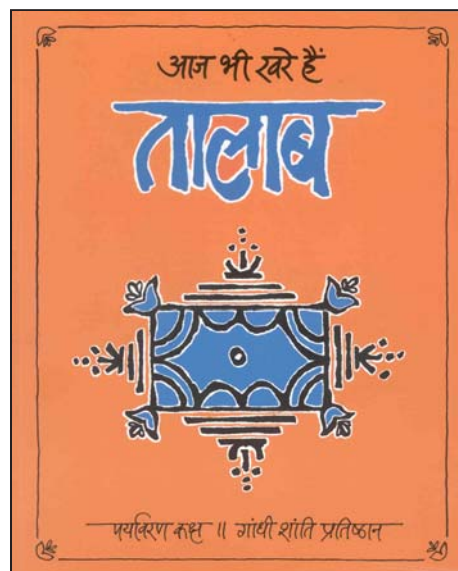
**L**ocal challenges are best tackled by local knowledge. This pithy axiom holds particularly true for disaster risk reduction. Since the term risk is relative to the local context, therefore, the approaches to reduce risk should be thoroughly grounded in the local milieu.

A seminal work of local literature that promotes this ideology is a book called '*Aaj Bhi Khare hai Talaab*'. Written by Anupam Mishra, this book provides a detailed account of the rich historical tapestry of '*Talaabs*' or ponds in India and their role of providing respite to the people in times of drought. The book focuses on the great nameless and faceless individuals who selflessly built some of the greatest '*Talaabs*' in the country.

Meticulously researched and passionately written, the book provides an in depth account of the economic and socio-political significance of these '*Talaabs*' in shaping the community life in India till the 19th century. The book bemoans the waning and eventual loss of this tradition of building these big '*Talaabs*'.

Scathingly critical of the flawed model of modernity pursued relentlessly by post British India, the book admonishes about the consequences of letting go of traditional knowledge systems to blindly ape 'Western' models of development. Overall, the book is a stunning work that aptly captures the significance of '*Talaabs*' in mitigating the risks faced by the various communities of the country. ■

– Kshitij Gupta



# Rebuilding the Uttarakhand from Ground Zero

Tragedies if cannot averted, can be managed with minimum devastation by the proper planning. It is widely discussed that man made factors have aggravated the disaster and compounded the scale of damages in Uttarakhand. Indiscriminate creation of hydro-power projects; deforestation and construction of roads to accommodate increasing religious tourism are the prime reasons for the huge scale of devastation. In other words, Uttarakhand becomes the victim of its own growth story which is, the vicious nexus of: more development or growth of the region – need of more energy – use of more water and all of this has been done in a way which is ecologically unsustainable.

By 2030, the world will need between 40% and 50% more water, food and energy, according to UN and Shell analysis. In the new world, Interdependence amongst these resources – the stress Nexus – will not only increase the volatility : *more energy requires more water; more food and water requires more energy*, but also increase the unsustainability of economical development when it is based on the unsustainable ecological development.

In the context of the recent Uttarakhand tragedy, we need to look through the lenses of the paradoxes of prosperity, leadership and connectivity which will help to understand the root causes of the tragedy and shall highlight the key future requirements to reimagine and thereby rebuild a newer and more robust Uttarakhand.

The prosperity paradox: while it is true that economic development in India is raising living standards for millions but it is also developing an

environmental, resource and political stress which is undermining the benefits of the prosperity. In Uttarakhand, the state government has promoted tourism to a point when tourist arrivals reached 25 million, almost two-and-a-half times Uttarakhand's population of 10 million. Hotels, houses, shops and restaurants were recklessly built upon caving roadsides, steep slopes, and worst of all, on the flood plains of rivers. Private gains have flourished at the cost of public good. While promoting tourism is the right thing to do for the government, it is equally important to ensure the ecological sustainability of the region. The real challenge for prosperity is to prosper without sacrificing efficiency of the system.

The Leadership paradox: Addressing stress nexus requires co ordination among an increasing constituency of decision makers. If leaders assume that problems are too hard to solve and the solutions too unpopular to execute, stresses in the development will be ignored until liveability is threatened. In context of Uttarakhand, Government needs to tighten themselves first. For example, there must be immediate check on the development of hydro based power projects considering their very nature of intrusive construction, mining of building materials from river bed and changing the natural course of rivers without forgetting the fact that much of the Uttarakhand e lies in the seismically active zones, with high tectonic activity that can suddenly alter the contours of land and the course of rivers. Similarly, the National Disaster Response Force (NDRF), which works under the National Disaster Management Authority (NDMA), lacks a proper disaster communication network.

This is a manifestation of the absence of co-ordination, ownership and decision making amongst the various government authorities.

The Connectivity paradox: All aspects of the society must work together to solve the problem : government has to offer better incentives and sanction for the smarter growth; society must be encouraged to moderate demand for goods in favour of infrastructure for the whole; and the business must offer smarter and more integrated infrastructure. Again in context of Uttarakhand, the Government need to encourage and incentivize the other form of renewable energy sources (i.e. Solar, wind power) to meet the growing energy requirements. Business may provide required technological supports through their various CSR (Corporate Social Responsibility) activities to fund the infrastructure requirements i.e. putting up advance warning systems like relatively inexpensive radar-based cloudburst forecasting technology over and above investing in the State through PPP models. While people at large also need to pay attention to the warnings when heavy rains have been predicted and should co operate to the government as and when needed.

In summary, Uttarakhand has to strike a balance between the region's fragile ecology and development. After all, the resource stress nexus also presents opportunities which may call for new collaborations and as an African proverb suggests that to Go fast, go alone –but to go far, go together. ■

– Divyesh Desai

Regional Marketing Manager, Hazira  
LNG Private Limited, Ahmedabad



# School Safety in Sikkim: NSSP and Beyond

On September 18, 2011 the northeastern Indian state of Sikkim was rocked by an earthquake measuring 6.9 on the Richter scale<sup>1</sup>. This earthquake had an adverse impact on the lives and livelihoods of the people living in the region. It has been two years to that tragedy and this presents the apt time to assess the state of recovery and rehabilitation that has taken place during this time.

It is well known that Sikkim lies in seismic zone IV<sup>2</sup>. Thus, there is a possibility of earthquakes occurring there in future as well. This necessitates that the planning and preparedness of the state is up to the desired standard to combat the adverse affects of any such future contingencies as well. This dual focus on preparedness and recovery is essential to ensure a more resilient state in the future.

One important aspect of preparedness ought to be a renewed focus on schools. It is well known that children by the virtue of their unique physical, psychological and social stage of development represent the demographic group most vulnerable to the detrimental impacts of disasters<sup>3</sup>. There is thus a need to make schools safer for children to blossom in a safe environment that is conducive to learning. The Sikkim earthquake of 2011 caused immense damage to schools. Out of a total of 779 schools in the state, 682 school buildings were damaged. In Sikkim, all schools whether primary, middle, high or senior secondary, start from class I, unlike in other states<sup>4</sup>.



*Retrofitting work at North Sikkim Academy, Mangon, North Sikkim.*

Children fall in vulnerable group and children in primary classes are more vulnerable to disasters. Hence, in the case of Sikkim, since all schools have primary classes, they all become more vulnerable. This end can be achieved in Sikkim by starting a school safety project in the state.<sup>5</sup>

Following a judgment by the honorable Supreme Court of India, the National School Safety Programme (NSSP) was launched. The NDMA has undertaken a pilot project for school safety, involving two districts in 22 States/UTs, falling in seismic zone IV and V for earthquakes. Each district is to shortlist 200 schools for capacity development on disaster management. Two districts of Sikkim, involving 400 schools have been shortlisted for building the capacity of schools, under the School

Safety Programme of the NDMA. This will help in making schools safe.

School safety has also been recognized by many UN agencies as a priority area of action. The United Nations Children's Emergency Fund (UNICEF), has come out with a lot of guidelines and policy papers for making schools and hospitals safe for children all over the world.

The school safety project in Sikkim would focus on building the capacity of teachers from various school of the entire district in successfully mitigating the adverse impacts of various disasters. The aim of this exercise would be to induce and inculcate a culture of safety and preparedness in the schools to which these teachers belong to. Essentially, this project would be known as the Training of Teachers (ToT).

1 [http://atiwb.gov.in/index\\_htm\\_files/Earthquake.pdf](http://atiwb.gov.in/index_htm_files/Earthquake.pdf)

2 [http://atiwb.gov.in/index\\_htm\\_files/Earthquake.pdf](http://atiwb.gov.in/index_htm_files/Earthquake.pdf)

3 [http://www.unicef.org/media/files/Climate\\_Change\\_Regional\\_Report\\_14\\_Nov\\_final.pdf](http://www.unicef.org/media/files/Climate_Change_Regional_Report_14_Nov_final.pdf)

4 [http://idsa.in/system/files/jds\\_6\\_1\\_KhannaVermaKhanna.pdf](http://idsa.in/system/files/jds_6_1_KhannaVermaKhanna.pdf)

5 [http://idsa.in/system/files/jds\\_6\\_1\\_KhannaVermaKhanna.pdf](http://idsa.in/system/files/jds_6_1_KhannaVermaKhanna.pdf)

The All India Disaster Mitigation Institute has been one of the leading agencies in India to facilitate such trainings in collaboration with various state governments.

Since 2001, AIDMI has worked consistently towards making schools safe in India. AIDMI's school safety campaign has brought under its ambit the schools of various districts from 10 states/union territories. In promoting Child's Rights to Safer Schools AIDMI has provided a total of 172 trainings which covered a total of 2089 Schools and 5549 teachers. Under the Child's Rights to Safer Schools Campaign, school safety audits were also performed on 664 schools across 8 states/ union territories of India.

Recently, AIDMI has successfully finished Phase I of the Training of Teachers (ToT) in all the 27 districts of Assam. These trainings were done with the support and collaboration of the Assam State Disaster Management Authority (ASDMA). The positive impact of these trainings has been far reaching cutting across several issues.



*Knowledge base for children needs to be strengthened by making schools safer.*

Given the potential hazards that the state of Sikkim is exposed to, a school safety campaign in the state seems imperative. The All India Disaster Mitigation institute with its experience of making schools safe all

over India and by virtue of being involved in the relief work post the 2011 earthquake is aptly suited to partner the Sikkim State Disaster Management Authority in the school safety campaign. ■

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