

Nuclear disaster in Japan

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JAPAN is in the throes of an epic disaster of a magnitude the world has not seen before. The earthquake of 8.9 magnitude in the Richter Scale, with the epicentre only a few kilometres away from the Fukushima reactors (6 units), was the strongest in living memory in Japan. The many aftershocks of 6/6.5 magnitude were considered as minor irritations, whereas in any other place a 6 magnitude earthquake would have been considered a major disaster.

Following the earthquake, a tsunami of up to 30 ft. high struck the coastal areas, destroying thousands of homes, offices etc., and killing more than 10,000 people. Since then, Fukushima nuclear power plant started showing signs of damage. Four units of the Fukushima plant have now suffered damage and there are signs of partial core melting in all of them. Fortunately, the other two units are still intact. The state of Fukushima reactor units, as of March 16, is shown below (courtesy of the BBC).

The primary cause of these disasters is the loss of cooling water. At the onset of the seismic event the reactors had been shut down, as they were supposed to be. This means that the control rods were inserted into the reactor core leading to the termination of core criticality, and fission processes which generated heat had also ceased. Because of shutdown, the power output from the plant stopped. It is normal practice to use part of the generated electricity to power feed

pumps which supply cooling water to the plant. Loss of plant power is backed up by external grid supply and in-house diesel generators.

Even when there is no heat generation due to fission process, there remains a considerable amount of remnant energy, known as decay heat, in the reactor -- which could be as much as a third of the full generation capacity of the reactor -- immediately after the shutdown. This decay heat gradually diminishes over a period of days and weeks.

If the decay heat is not removed, the temperature of the fuel rods in the reactor core rises, which could lead to damage of the fuel. At the same time, zirconium cladding of the fuel at high temperature would react with water producing zirconium dioxide and hydrogen. Hydrogen is highly combustible and can undergo auto-ignition.

When all four reactors were shutdown, there was no in-house generated supply of electricity to feed the pumps. External power supply may have been disrupted following the earthquake and tsunami. So the third line of defence -- the diesel generators --

was supposed to kick in. It is not certain whether surge of water in the tsunami incapacitated the diesel generators or the earthquake damaged the cooling water pipes. But the endpoint was that there was little or no cooling water to remove

ing. Thus, generated hydrogen had been building up in the containment building and eventually there was an explosion. The blowing up of the buildings was what was shown on television worldwide.

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ment building they were released into the outer atmosphere. That is why some increase in activity had been detected in the outside atmosphere sometime after the initial explosion.

The unfolding of the catastrophe at Fukushima following the nuclear power plant disasters has opened up a debate in the world nuclear stage -- is nuclear power safe?

This question of nuclear safety had been relegated to back stage over the last ten to fifteen years under the twin barrage of global warming and energy shortage. Nuclear energy is rightly seen as a green energy with little or no greenhouse gas emission (GHG). Nuclear energy is envisaged to meet the growing energy demand worldwide when hydrocarbon resources (coal, oil and gas) are being depleted at ever increasing rates. So, why not use nuclear energy, which would solve the twin problem in one swoop?

As it is said, there is nothing called free lunch. Nuclear energy may solve the twin problem facing the world today, but it comes with its own problem -- nuclear risk. We

did face two major nuclear accidents -- the Three Mile Island accident in 1979 and the Chernobyl accident in 1986. But since then we deluded ourselves into believing that major nuclear accidents cannot take place any more as better technology and better safety provisions are being incorporated now. But this cocoon of comfort has now been badly shattered by the unfolding disasters at Fukushima.

Bangladesh is contemplating the construction of a nuclear power plant at Rooppur in Pabna. The Russian design VVER 1000MW is the favoured reactor type. Although no safety assessment has yet been carried out for this type of reactor at the chosen site, it would be imperative that a robust safety analysis is undertaken, addressing not only the traditional internal and external hazards but also coincidental internal and external hazards.

The design of the nuclear power plant in Bangladesh needs to take into account the occurrence of incidental hazards, and adequate protective and preventive measures must be installed. Quite often, hazards with a probability lower than 1 in a million are ignored in analyses and incidental hazards with a combined probability lower than 1 in 10 million are left out of consideration. It is time to review the safety standards before going full steam ahead with the nuclear power in the country. After all, we must not forget Murphy's law: "Anything that can go wrong will go wrong."

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the decay heat. This led to the generation of hydrogen in the reactor pressure vessel (RPV).

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Sustainable impacts for the extreme poor

HANNAH MARSDEN and JONATHAN PERRY

THE term "sustainability" is often heard in policy discussions on poverty alleviation. How can we achieve sustainable positive impacts in the lives of the extreme poor; gains that are protected and can be built upon after a poverty alleviation project has ended?

Despite the efforts of hundreds of NGOs over the years, the reality is that the lives of extreme poor households are shaped by a wide range of factors often outside the control or time-scales of specific project interventions. Natural disasters, local

extreme poverty? More robust, carefully planned and perhaps innovative "sustainability strategies" are needed.

The extreme poor are the poorest in society -- those at "the bottom of the ladder." In Bangladesh, 25% of the population (35 million people) live below the lower poverty line (as of 2005).

Given that many of this group have lived in extreme poverty for a long time -- "chronically" extreme poor -- it follows that a long-term vision is needed for their movement out of poverty. They face specific challenges to making sustainable gains, and this heightens the

of poverty reduction efforts, so that the "climb up the ladder" for the poor beneficiaries can continue even after an intervention ends.

There is considerable room to strengthen these long-term strategies in poverty reduction programmes across Bangladesh and internationally. Temporary interventions may create a platform and catalyse sustained improvement in the lives of the extreme poor; but how?

Many projects aimed at improving the economic conditions of the poor or extremely poor involve providing some type of asset, perhaps combined with access to low-cost inputs and techniques for production and building market links for the sale of produce. However, sustaining immediate income improvements after project support for these activities has ended has been a challenge for many NGOs or other project implementing agencies over the years.

As such, there is large scope for creativity and innovation when thinking about sustainability strategies. It seems that we must simultaneously address a number of areas of economic and social life which influence households' ability to move out of extreme poverty while, at the same time, integrating activities with a longer-term, holistic perspective.

This might involve encouraging diverse use of increased capital through a range of asset or savings options, or replicating or intensifying the use of assets in a way that generates a sustainable cash flow. Exploring the potential of new technologies is another option, as well as building the confidence to adopt these technologies after the end of a project.

In the same light, the extreme poor need to be empowered to be able to do their own market analysis and identify future profitable gaps in local markets. Branching out to non-

local markets by the end of the project could improve the likelihood that initial gains made by households can be built upon after the direct support from an NGO ends.

Furthermore, integrating NGO activities with local governmental service providers who will continue to be there long after the project ends is of paramount importance. Because the institutional arrangements for the extreme poor are often weak, making it hard for them to claim their rights and entitlements (e.g. with local government, the legal system, or the police), how can the voice of the extreme poor be made louder?

Many extreme poor lack access to adequate social protection, including social safety-nets, even though they are the people who most need it (e.g. the disabled, chronically ill or the elderly). Creative plans to work with such vulnerable groups for their survival after a project ends are needed. How can there also be greater collaboration with and between NGOs and government?

Also, halting the intergenerational transfer of poverty is known to be important for reducing extreme poverty in the long-term. How can economic empowerment programmes encourage this? This could mean linking children with education services, or directly trying to address the nutritional needs of vulnerable groups such as pregnant and lactating women and under 2 year olds.

Encouraging more equal gender relations at the household and community levels could also be crucial to making a sustainable impact on the lives of the extreme poor. For example, evidence shows that empowering women to have increased decision-making power can have positive effects for intra-household investments and distribution, which will have lasting impacts on the future of families after a project ends.

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Prof. Yunus: A rare gem

SHAMIMA AMIN-METHU

THE 2006 Nobel Peace Prize winner, Prof. Yunus, is like a rare gem. This rare gem should be displayed in the National Museum as a treasured showpiece; instead, some people in Bangladesh are trying to break the gem into pieces to verify its purity. There is no need to destroy this treasured gem in the name of purity verification.

Bangladesh has always been known as one of the poorest nations in the world and for its natural disasters, floods, cyclones, etc. However, Prof Yunus depicted Bangladesh differently. He made the world realise that Bangladesh

may be poor in terms of resources but it is rich in producing brilliant minds like him who can help the whole world. He has been helping the poor and the women, the two most neglected groups, for decades in Bangladesh and around the globe.

His social business ideas are brilliant. They solved social problems which had been in existence for many years. Social Business is an impressive way to satisfy the needs of needy people. There are not many individuals in Bangladesh who constantly think about improving the lives of the poor and needy, who are in desperate need of help to survive.

Prof. Yunus not only thinks about their day-to-day needs, he also thinks about their education -- the key to their future success. He has established nursing schools in collaboration with foreign universities to train poor women so that they can stand on their own feet

and at the same time help their families.

Prof. Yunus is also concerned about the health of the poor. There are so many poor children who suffer from malnutrition. He introduces a special yogurt called "Shakti," which has all the vitamins and minerals that are essential for children's nourishment, in collaboration with Danone (a world renowned yogurt company). If a malnourished child eats this yogurt for several months, he/she won't have malnutrition problem.

The great humanitarian and observer, Prof. Yunus, noticed that the poor people in villages didn't wear shoes, and in many cases suffered from parasitical diseases.

He requested the world known shoe company Adidas to make shoes for the poor at a very low cost. At first the company was hesitant because they wouldn't be able to make profit, but Prof. Yunus convinced them to do so.

Prof. Yunus made a big difference in poor people's lives. The families that took help from Prof Yunus' organisations are now producing doctors, engineers and profes-

sionals. I salute this noble soul, a Bangladeshi native, the 2006 Nobel Peace Prize winner, Prof. Muhammad Yunus. I urge my fellow Bangladeshis to preserve this rare gem and give proper honour and respect to the only Nobel Prize winner from Bangladesh. Instead of harassing this honourable man, please let him shine like a luminous star in the sky so that the world can see its everlasting beauty.

The writer is an Information Scientist in Atlanta, Georgia, USA.

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MUNIR UZ ZAMAN/ DRUK NEWS

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environmental shifts and social and cultural beliefs or norms all play a large role.

How can we ensure that poverty reduction projects will be a defining turning point in the lives of the extreme poor, one that enables households to reach "the next rungs up the ladder" and not fall back into

chances that extreme poverty is passed onto their children, impacting on the continuation of extreme poverty throughout Bangladesh generally.

A sustainability strategy is a plan implemented as part of the core project design that is intended to maximise and sustain the successes