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# FOLENS Report on Fukushima Visit
# Nuclear Power Plant Accident and Agriculture

Nuclear power is a sustainable energy source which avoids the air pollution of the primary competition (fossil fuels), reduces carbon emissions, and can increase energy security if its use supplants a dependence on imported fuels. However, nuclear power poses many threats to people and the environment. These threats include health risks and environmental damage, the risk of nuclear weapons proliferation, and the unsolved problem of radioactive nuclear waste. But, after Tohoku earthquake and Fukushima nuclear disaster, environment and socio-economic related problems i.e., environment and industry, environment and agriculture, marine environment and radiation expose, public health and radiation expose are the most urgent for the present time.

So, the negative impacts of the catastrophic nuclear power plant accident are terrible-

- The negative effects of the Fukushima nuclear disaster after the tragic strong earthquake off the Eastern coast of Japan on March 11, 2011 still hangs in the air to this day and the radiation contamination level is above the tolerable limit such as on-floor measuring, Farm Sanctuary 6.27($\mu Sv.h^{-1}$).
- Affect the farmlands in Fukushima and its neighboring prefectures by radioactive materials deposition, contaminating soil, water and agricultural products i.e., Crops and livestock's.

- Food safety become questionable as high concentrations of radio nuclides were detected in cultivated green leafy vegetables and fresh raw milk, caused by the direct deposition of radioactive materials.
- Shipment of crops from the affected areas was immediately become restricted. So consumer's reluctance in buying Fukushima products and economy goes terribly down.
- It also poses potential contamination hazards to soil and surface and groundwater, and to people encountering tsunami sludge and debris.
- A long-term problem is soil contamination by radioactive cesium, particularly by 137Cs with a half-life of 30 years.
- Forest ecosystem of this locality will be breakdown.
- For reduction of contamination removal of huge amount of top soil, inverting top soil also became a headache.
- Long term without cropping the land become unproductive
- Accumulation of dry deposition, Cs movement through the water network has become a great question for watershed ecosystem.
- Radioactive contamination of the Pacific Ocean following the nuclear incident has raised public concerns about seafood safety. Based on currently available information, some seafood in the direct vicinity of the nuclear power plant has been found to be contaminated at levels above the regulatory limits.
- Decline agriculture tourism as the city becomes a dead city.
- One of the catastrophic consequences of Fukushima disaster is radiation exposure, cause certain physical diseases, including cancer (for example, thyroid

gland, and leukemia) and genetic inconsistency. Moreover, the local people including the farmers suffered mental insecurity for their future.

- Separated farming communities and families arises conflicts for the rehabilitation.

Although, there are so many problems regarding socio-economic, environmental context but we saw a bright hopes for recovery such catastrophic nuclear disaster –

- Both the government and people willing to make continued efforts to take really effective steps for rehabilitation.
- Government able to do build up public awareness about the aftermath of nuclear disaster and what they can be done.
- Many NGOs are working in the affected territories with support from volunteers for networking of farmers and communities for dialogue and action for encouraging them to rehabilitate. Moreover, volunteer centers are established in local communities to accept and coordinate volunteers.
- Older people tendency to return their homes seems light of rehabilitation.
- Continual monitoring of the radiation levels of agricultural products for saving the agribusiness.
- Committee for organic farming and community development in Towa become a highly motivated task for people mind set, to fight against the radiation contamination.
- Monitoring and mapping the radiation contamination level for determining the restricted area.
- Rearing of livestock by "Kibouno no Bokujyou Fukushima" become an enormous source for research to save the livestock sector from such nuclear disaster.

- Moreover, scientist approach for removing/ reducing the radioactive materials and establish a sustainable agricultural production system, become highly enthusiastic for restore of Fukushima Agriculture and Environment.

## Lessons for Future-

The Fukushima disaster and human, environment, agriculture and economic damages followed after –

- Helps to Forced all people to think about their lives and the problem of energy secure in the context of living price and values. If we do not have nuclear power plants, we would not have to be concerned like this about radiation risks and many other aspects.
- New look for today released recommendations for a new nuclear safety construct that will reach beyond the traditional regulatory framework of adequate protection of public health and safety to minimize socio-political, environmental and economic consequences caused by radioactive releases from accidents
- It considers all-risks.
- It addresses potential improvements in human performance, command and control l, accident management, and emergency preparedness.
- It should be embraced globally and calls for building global consensus on its principles and implementation strategies.
- Gives a new arena of challenge for the researcher that what they could be done to mitigate impact of the radioactive materials on the environment, ecosystem and food.

## How did experts approach for the problem?

- As an environmental scientist we studied the structure of radioactive cesium distribution in soil and found the exponential dependence.
- Utilize the knowledge gathering from 1986 Chernobyl nuclear disaster, that use of bio-remediation by using sunflowers and rape blossoms to decontaminate soil. Radioactive cesium is similar to potassium, a commonly used fertilizer. If potassium is not present, sunflowers will absorb cesium instead. If the harvested sunflowers are disposed of by burning them, radioactive cesium could be dispersed through smoke and can be considering using hyperthermophilic aerobic bacteria. So more potassium loving crops can be cultivated.
- Can be searching such plant material that can directly harvest Cs from air by the stomata.
- Identifying the microbes in the rhizospheric soil so that they cannot allow the uptake of Cs.
- Use Bio-fertilizer for reducing the long term effect of Cs.
- Identifying the interaction of soil and vegetation of radionuclide transfer and accumulation
- Helps to development of safe and secure production technology for sustainable agriculture in the threaten area.