



# BOILING POINT

Containing the 'spill over' of Climate  
Change on the Indian subcontinent

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**Cover Image:** People in a slum in New Delhi fighting for their share of water.


As one of its serious implications, climate change is threatening to bring about acute urban water stress. Rising urban population due to climate induced migration is further going to complicate things.

(Photo: Sarika Gulati)

Written, edited and compiled by Pratishtha Dobhal

Designed and produced by Safer World Communications

This document is part of the Pan India Climate Change Mitigation and Adaptation Strategies, a collaborative effort by SEEDS and Christian Aid to educate communities and duty bearers on combating climate change.



Climate change impacts are a clear and present danger to the Indian sub-continent. The report — **“Boiling Point”**, seeks immediate attention of every responsible citizen in the country so that they may take appropriate action that can help in long term mitigation and local level adaptation. It presents case studies from different parts of India, where local communities are already under the assault of climate change. Ten broad areas of intervention have been identified in the given national context.

We, at SEEDS, are committed to empowering local communities for adaptive action towards restoring security to life and basic necessities. The starting point of our intervention is education for sustainable development. We realize that this task would be incomplete unless we simultaneously amplify the voice of the affected to government and key national stakeholders for a long term vision.

The Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters (HFA) under its priorities for Action clearly earmarks reducing the underlying risk due to climate change. SEEDS recognizes the need for a consolidated effort on everyone’s part to tackle with the problem of climate change. As a result, all our initiatives on disaster risk reduction try to incorporate the mitigation and adaptation to climate change. SEEDS, through its advocacy campaigns endeavours to bring out effective policies at the strategic level, and awareness and commitment at the individual level to combat climate change.

This report has been made possible by diligent efforts of the SEEDS Safer World Knowledge Center Team, who have made several trips to the far corners of the country to obtain information straight from the horse’s mouth. Consultations and assessments were carried out with local communities that are direct victims, key government officials and other stakeholders. Information collected from the field has been further substantiated with secondary research based on data collected from government departments, published articles and other reports. The Safer World Communications Team of SEEDS designed and produced this report. We would like to thank Pratishtha Dobhal for bringing together inputs towards a coherent document. Our gratitude goes out to Ignatius Prabhakar, Ghani Zaman, Subhasish Mohanty, Manoj Kar, Hemanta Kumar Rout and Peetabas Panda for their stories from the field. Special thanks to Dr. Thamizoli, Dr. R K Sood and Prof. R R Krishnamurthy for their valuable inputs.

We, at SEEDS, hope that this report inspires you to join us in action. We look forward to your ideas and suggestions. Write to us at [info@seedsindia.org](mailto:info@seedsindia.org)

Manu Gupta

Executive Director, SEEDS

December, 2008



Photo : Sarika Gulati

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There are some things that can be arrived at, through deliberation, while there are a few 'extraordinary' others which are obvious and don't require validation from more than one source. Among those astounding 'few' that have the power to completely take over our lives and henceforth challenge our very existence is 'Climate Change'. While it's no news that the world is gearing up to limit the effects of this turnover of the climatic conditions, we at **SEEDS** feel that awareness is the key to taking things a little further away from merely ideation to action!

For a country of more than 1 billion (and growing) which is deep in the throes of making its own mark worldwide, climate change and its far reaching effects is a matter of grave concern to all of us. It's not flippant or frivolous; it's amongst one of the most burning challenges set to give us more than a few hiccups along the way with disastrous consequences. Silent acceptance and escapism is not an option; gearing up for the climatic assault through concerted efforts is the only key. It's time unheard voices from the field are given a platform

to voice their angst over the severe repercussions of climate change that is already inflicting them. It is with this purpose in mind that we have compiled together an approach to National Action on Climate Change that comprehensively entails how severely the country is already being swept under the sea of change and the only way of dealing with it is by no longer taking a backseat but by being as keyed in to what is happening nationwide, spreading awareness and through constant and earnest partnership with the government.

We bring to you case studies from inflicted zones, across the country, which stay as reminders of how we can't even afford to look at these cases as isolated incidents. The only way of even pretending to do that is taking out the value that human interest holds while chalking out a Climate Change Policy. There is a trenchant need to comprehend that climate change is no longer a part of pulp fiction or the byproduct of the maneuverings that celluloid allows, it's more real than the reel representations.



Photo : Sarika Gulati

It's imperative to also take into account that each area around the world will see varying implications of climate change. Rains in deserts, droughts in floodplains, heat waves, cold waves, urban floods and extreme water scarcity are all glimpses of the future in a changed climate. The unpredictability of it all is even more unnerving than the eventuality and the only common thread that might sustain our inhabitation amidst this uproar are common people—the agents of change. Instead of going on a fast forward scheme, a step into the foreground needs to be attempted. Starting from the grassroots and moving upwards trying

to fit as many people in the threshold of change as possible.

The focal point needs to remain on how we can best influence behaviours so that the future doesn't seem as daunting as we feel it might eventually be!

The national approach through its radical yet practical precision needs to have at least the following areas covered. These 10 areas are already in the midst of being compromised unless prompt action is not taken to safeguard these key areas.

**1 WATER MANAGEMENT**

**HEALTH SAFETY 6**

**2 ENERGY MANAGEMENT**

**PLANNED URBAN DEVELOPMENT 7**

**3 NATURAL ENVIRONMENT CONSERVATION**

**DISASTER RISK REDUCTION 8**

**4 APPROPRIATENESS OF BUILT ENVIRONMENT**

**ATTENTION TO SPECIAL GROUPS 9**

**5 LIVELIHOOD SECURITY**

**EDUCATION ON COMBATING CLIMATE CHANGE 10**

We shall further elucidate how these key areas cannot be given a miss or understood to be trivial concerns in the larger scheme of things through supporting case studies that are a result of the present climatic condition.



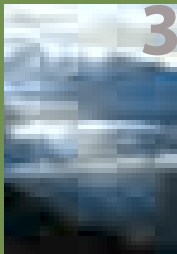
## 1 WATER MANAGEMENT

Water is one of the most critical areas threatened by climate change. For India, it is projected

Shifts in the rainfall patterns and timing are already leading to water related calamities. Water,

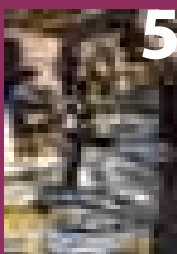
and in control of water wastage.

## ENERGY MANAGEMENT



## 3 NATURAL ENVIRONMENT CONSERVATION

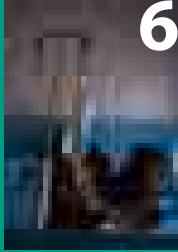
## APPROPRIATENESS OF BUILT ENVIRONMENT



## 5 LIVELIHOOD SECURITY

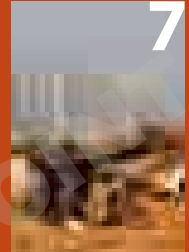
pesticides and crop management technologies. This, combined with the absence of credit and



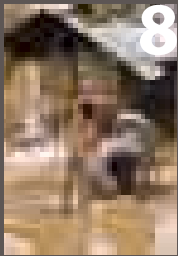


**6 HEALTH SAFETY**

**PLANNED URBAN DEVELOPMENT**



**7**



**8 DISASTER RISK REDUCTION**

**ATTENTION TO SPECIAL GROUPS**



**9**

to be addressed.



**10 EDUCATION ON COMBATING CLIMATE CHANGE**





SEEDS INDIA, BOILING POINT

# 1

There are some universal truths that might be subject to a good debate but they have a pretty conclusive 'sealing' once they are dissected, rationalised or analysed! You scratch your head, wondering what it might be, and perhaps why we are talking about sealing here?—but it just leads us to the focal point and the irrefutable empirical truth—it's impossible to survive without hydrogen and oxygen fusing together to make one potent compound...Water!

## WATER MANAGEMENT

## “ Water water everywhere but not a drop to drink! ”

Water covers about 70.8% of the earth’s surface, so while the planet might look like a blue blurb from space it doesn’t make the entire length and depth of the blue expanse ideal for living. Shifts in the rainfall patterns and timing are already leading to water related calamities. This has further led to serious consequences like not being able to manage the resources at hand—water stress, urban drought due to increased settlement (Varanasi, which sits higher up the river Ganges is ridden with sewage problems that is draining it mercilessly); diversion of rivers into lakes; industrial waste

dumping into the main water sources and channels; irrigational challenges because of climate change are only few of the many hurdles that have crippled water management—the lifeline of any nation! The case studies enlisted are landmark jolts that should shake us out of our slumber of sitting vacantly without attempting to bring about remedial actions with regard to the current water scenario! Balasore, Orissa, just happens to be amongst one of the inflicted areas.

Further feeling the tremors of climate change the residents of the Balasore are unable to cope with the increase in disaster frequency and have started migrating from the area due to loss of land and livelihood. The migrations have led to a number of social problems such as breakup of families.

“Reuters/Utpal Banuah, courtesy www.alertnet.org”



## Case in point Balasore

Rainfall and flood intensity has increased manifold in the district of Balasore, (Eastern Orissa) over the years. The unexpected frequency of rains here has resulted in the destruction of the rice crops further escalating the massive food shortage in the state. Once called the 'Granary of Orissa' (a district of paddy, betel and fish) it's now reduced to a rainfed disaster that's sinking in the turbulent weather conditions. Even rain is testimony to this change—the average rainfall that the district would get otherwise in a year was about 1568.44 mm, with an average of 62 rainy days in a year, however climate change has managed to spike the average rainfall of the district to 1922.6 mm.

It's unnerving to acknowledge that Balasore has been declared disaster affected for about 75 years out of the last 105 years, and the extreme weather conditions have reduced its food production by a staggering 40%. The economic impact of the flash floods in the coastal district of Balasore was Rs 508 crores in 2007 since many roads, bridges, houses and paddy crops were washed away by the turbulent waters of the overflowing rivers. The Bay of Bengal, in addition to all this, is merciless with the frequent cyclonic storm and depression raised due to global warming.

"Reuters/Rafiqur Rahman, courtesy www.alertnet.org"

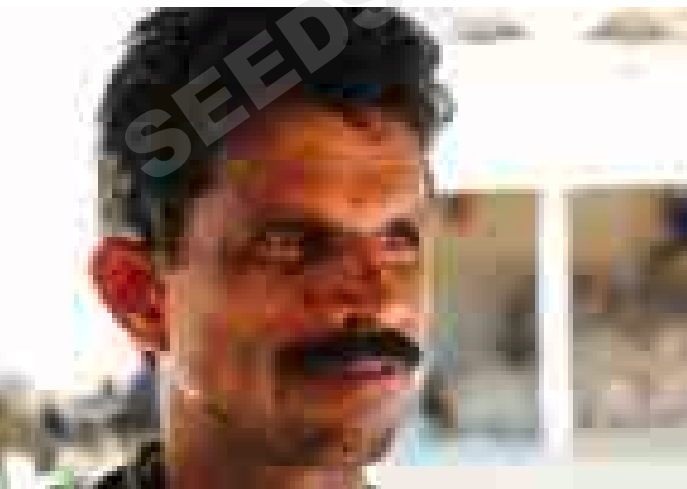
Going by the key parameters of climate—like temperature and rainfall, the climate may worsen in Balasore. More frequent occurrence of floods, as well as rise in sea level will threaten the livelihoods of a vast majority here!

Prasanta Kumar Padhi, environmentalist

Brundaban Swain of Kasimila Village under Basta Block in Balasore District is a worried man today. Five successive floods in August and September 2007 have broken his backbone. He is yet to cope with the situation and resume back to leading a fairly normal life.

He explains—“We used to stay under flood water for at least two months in a year. We have been experiencing this problem since the 1999 super cyclone. Though the super cyclone had not affected our village but since then this region has been experiencing serious flooding every year. What makes the situation even worse is that in spite of regular flooding no remedial action has been adopted to curb or contain it.”

The same problem affects other villagers like Haladhar Sahu, a resident of Baliapal. The flood in the area he belongs to has destroyed almost all paddy crops besides damaging the houses and killing cattle population.



Our place of stay gets submerged during August and September every year. As the place is low, floodwater gushes into the houses forcing us to take shelter on the road. It is ironic that although our houses are made of concrete they can't contain the gushing flood water. Besides, the river is changing its course all the time and eating out its shore which instills more fear and panic among the residents.

Basa

**Case in point**  
**Ennore**

Ennore Periya Kuppam, a fishing hamlet, situated in northern Chennai has been subjected to constant erosion for the past 30 years. The distance that has been eroded is about 1.5 to 2 kms according to the fisher folks of this hamlet. This has led to unequivocal displacement of the people and increased sense of despair and doom amongst them. What's more, it's an industrial township with many private shipping companies and oil refineries.

"Reuters/Jayanta Shaw, courtesy www.alertnet.org"

When the sea came towards us, we were able to shift towards the west of this hamlet. But again if it comes we do not know where we would go.

Villager at Ennore



## THE CATALYSTS

The rise in temperature or heat leads to increased evaporation which in turn leads to excessive rainfall that causes flash floods. Following a chronological pattern, the increased evaporation also leads to increase in water vapour content in the atmosphere which becomes the catalyst for warmer

temperatures that affects the crop production adversely, as it did in Balasore.

What remains as a grave reminder is that there are other areas that have also been adversely affected in the same manner as Balasore, Bhadrak, Mayurbhanj Kendrapara, Cuttack and Jajpur in 2007, are among those inflicted zones.

The great thing about coping mechanisms within the system are some of the practices that have helped in managing the water crisis at the ground level. Tarun Bhagat Sangh (TBS), a non-profit organization, is instrumental amongst such rising practices and was started in 1985 with the objective that it would bring people together on the issues of management of forests and water resources. Since 1985, 4000 water harvesting structures have been built by the local people with support from TBS. Under NREGA (National Rural Employment Guarantee Act), provisions have been made to safeguard and rejuvenate traditional water sources through the help of the state government. Other adaptation options include agro forestry methods, including establishment of a small inland plantation which is proposed along freshwater canals and ponds.

The CCIFEH (Climate Change Impacts on Freshwater Ecosystems in the Himalayas) Program has selected Mousuni Island, in India, out of the 54 inhabited islands, as a pilot site to observe and study these impacts and to introduce adaptation strategies in the villages of this island. The program seeks to develop state level awareness generation towards effective participation by the local stakeholders in vulnerability reduction from extreme climatic events.

Due to the infrequent weather conditions and the unpredictable pattern in Himachal Pradesh the villagers, thanks to encouraging support from Environment and Rural Awakening (ERA) as well as CASA (Church's Auxiliary for Social Action), have resorted to traditional rain water harvesting structures called 'Khatri' or 'Diggi'. A Khatri is basically a square tunnel at the foothills,



which is about three to four meters in length, followed by a vertical basin at the inner end. Rainwater seeps into the Khatri through the mountain slopes and the water is collected in the basin. This is a great way to not only save water but manage it for the long run when you most crave it!

The Pani Panchayat of Mahur in Maharashtra has also helped generate a pleasant buzz amongst the farmers of the village! Mr. V. B. Salunkhe initiated the experiment of organising the local populace to harness the available water resources for agriculture in a drought prone area characterised by high levels of poverty in Pune District of Maharashtra. In order to optimally utilise the locally available meager water resource for protective irrigation and to fulfill the needs of food and shelter of the local

people on a sustained basis, initiative for water conservation and utilization of water by organised collectives of water users known as Pani Panchayat was taken up by Mr. Salunkhe and his wife during the early 80s. Orissa also decided to implement the same scheme for its irrigation related problems since 2005 through active participation by the government and the people.

Water, whether too much or too little, can threaten the very existence of people in its domain. Needless to say, the Climate Change Action Plan needs to focus on increased efficiency in usage and transportation of water; for human consumption, agriculture and industrial use; in water harvesting, recycling and storage; and in control of water wastage.





SEEDS INDIA, TIPPING POINT



SEEDS INDIA, BOILING POINT

# 2

There have been books, research scholars, and the concerned professor at college who've been stubborn in their belief that some good might come by telling us that those lights need to be switched off, the AC is not a necessity, it's just a luxury, the car can be ditched for a few friends pooling in for a ride, and the list goes on... The point is that all of the above mentioned dos, that have been meticulously listed out by concerned parties, point towards the one thing that we could all do with—adequate energy management!

**ENERGY MANAGEMENT**

## “Life on single radar to the point of explosion...perhaps not!”

Energy is one of the sectors that hogs maximum fossil fuels and emits huge amounts of greenhouses gases that trigger off climate change. India, being on a blazing path of development, is faced with an increasing hunger for energy, and while we work towards adapting to climate change, we also need to focus on the mitigation front wherein we can check in our consumption patterns. Moreover, if the current pattern for merciless industrial growth is taken into account it's quite obvious that we are blinded by commercial needs that energy so efficiently meets. One doesn't have to look too far, the following only happen to be blatant instances of being overridden by this hunger!



## Case in point Chattisgarh

Across the world biofuels/Agro fuels are being promoted as an alternative to fossil fuels and an answer to climate change. They have however started to generate intense controversy by getting into land conflicts and rise in food prices. Navdanya released its study on the social, economic and ecological impact of Jatropha cultivation for bio diesel in India 'Biofuel Hoax: Jatropha and Land Grab' at a press conference on 27th of November 2007. The study authored by Dr Vandana Shiva and Manu Sankar is based on field work in the three states of Chattisgarh, Maharashtra and Rajasthan.

India plans to cultivate Jatropha in 11 million hectares. In a land starved country this diversion of land has serious

consequences for rural livelihoods and rural eco systems. The Companies involved in the gold rush of Jatropha in India are D1 Oil, Godrej Agrovet Ltd., Tata Motors, Indian Oil Corporation, Kochi Refineries Ltd., Biohealthcare Pvt. Ltd., The southern online Biotechnologies Ltd., Jain irrigation System Ltd., Natural Bioenergy Ltd. and Reliance Energy Ltd. In Chattisgarh, a predominantly tribal belt, agricultural crops of tribals have been destroyed to plant Jatropha. To promote Jatropha plantations, the tribals are being denied their inherent right to make decisions about land use. This is a violation of the legal recognition of collective rights and Panchayats (Extension to the Scheduled Areas Act, 1996.)





The forest department forcefully planted *Jatropha* on our paddy land. They told us if you don't allow us to plant *Jatropha* you will go to jail. We have sent our plea petitions to the chief minister, District collector and BDO but to no avail. At last we had to uproot the *Jatropha* plants that were planted in our agricultural land.

*Santhoshi, from Daiharibagh Village, Kota Block of Bilaspur District, Chattisgarh*

Rajasthan, a desert state is also seeing the destruction of village commons and grazing lands (referred to as 'Wastelands' in colonial revenue categories) by the imposition of *Jatropha* plantations. On 7th May 2007, the Government of Rajasthan passed rules under its powers conferred by Section 261 of the Land Revenue Act of 1956 to create a new law called 'The Rajasthan Land Revenue (Allotment of wasteland for biofuel plantation and biofuel based industrial and processing unit) Rules, 2007'. The Rules allow 1000 ha - 5000 ha of village common lands to be transferred for 20 years from the village community to biofuel industry.

# THE CATALYSTS


India's per capita energy consumption rates remain low in comparison to those of countries like the United States and China. But India, the world's fifth biggest energy consumer, is projected to surpass Japan and Russia to take third place by 2030. It's a well known fact that by the 1990's India began liberalising its economy, allowing for privatisation of some sectors which were earlier under state control. However, energy remained one of the few that wasn't sporadically privatised. What has remained daunting in the larger scheme of things, is that very few alternatives have been scoured to meet the country's needs. With an ever increasing population, high demand for energy and about 80% of the country depending on unreliable power grids, we seem to be in big trouble. Overall, India's need for power is growing at a prodigious rate; annual electricity generation and consumption in India has increased by about 64% in the past decade, and its projected rate of increase — estimated at as much as 8-10% annually, through the year 2020 for electricity consumption, is one of the highest in the world. India's energy intensity vis-à-vis

GDP growth has been falling and is about half of what it used to be in the early 70s. Energy consumption, per unit of GDP in purchasing power parity terms is only 0.19 kilogram oil equivalent per dollar as compared to 0.21 of the world average. But there is still room for improvement which can be brought down significantly with current commercially available technologies.

Despite a reasonable growth in GDP and dependence on fossil fuels to meet the energy needs of India, carbon dioxide emission per capita in India is still low, i.e., around 1 tonne against the world average of about 4 tonnes and of about 19 tonnes amongst developed countries (Data and statistics provided by IEA).

## Would You Sign This Contract?

In Vidarbha, Maharashtra, companies are doing contract farming with the farmers. They have taken advantage of the failure of Bt cotton crops and have lured farmers into cultivation of Jatropha. The corporates have been successful in inducing the farmers into growing Jatropha on the false promise that the plantations will give them immense returns after three years.

A man in a purple polo shirt is pointing towards a large array of solar panels. He is standing in front of the panels, which are mounted on a structure. The background shows more solar panels and some greenery. The man has a name tag on his shirt.

The industrial biofuel policy is not a solution to the climate crisis or an answer to the oil hub. The massive infrastructure of fossil fuel based production and transportation systems cannot be maintained by converting food to fuel, and plants to oil for cars. The heavy infrastructure of automobiles and power generation needs to be adapted to the limits of the planet.

There's no denying that all of us are responsible for the high consumption of energy on a daily basis. However, while it's easy to take accountability for this usage, there's also no denying in the same breath that both public sector as well as the private sector units need to make sure that they have checks and measures in place to make sure only limited units are consumed. This check can only be administered through partnership with the government, with strict regulations being imposed. Over time and concerted efforts, it's imperative that we make ourselves self sufficient through effective oil conservation programs. Furthermore, the transport system should be managed in such a way that this sector consumes the least amount of energy.

Considering the foothold agriculture has in our country, we need to make sure that rural energy garners priority in the larger scheme of things. Perhaps the best way to actually further the cause of effective energy management is by reaching the masses while educating them on the basic do's and don'ts. Media partnership can really work like a charm since it's the most visually appealing medium and can be instrumental in tapping the masses through ingenious campaigns.

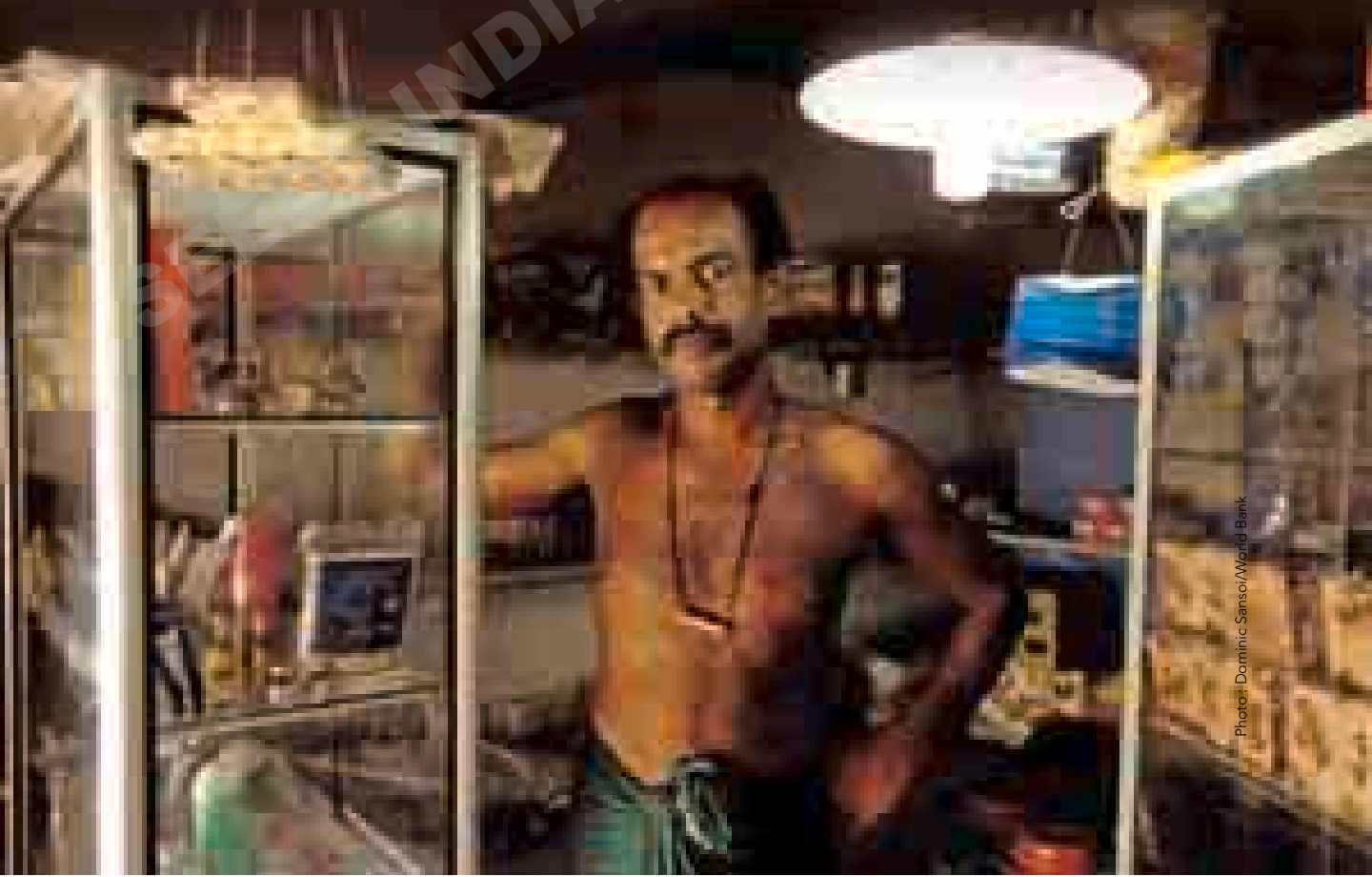


To protect rural livelihoods and food and energy security of the rural poor, agriculture policy must shift from chemical/ industrial/ corporate farming to biodiversity ecological farming. The village commons play a vital role in providing inputs to the agrarian economy. Integrated and sustainable sylvi-agri-pastoral systems need to be protected and strengthened to adapt to climate change. Decentralized food and energy systems are vital to enhance climate resilience and reduce climate change impact. Legal action needs to be taken to stop *Jatropha* biopiracy. D1 company should immediately return the stolen germ plasm to India. (courtesy Navdanya)

Greenpeace had also urged the Asian Development Bank (ADB) in 2006 to aid the fight against climate change by restricting the funds for fossil fuel projects and instead supporting renewable energy projects in

its place. Perhaps, it's also time for both public and private sectors to take the Corporate Social Responsibility (CSR) clause into effect and action instead of letting it just remain a fancy way of pandering to the ego of the masses and the head honchos. While the ADB had earmarked about 1 billion dollars towards renewable energy projects for 2008 we still need to see whether this thought has translated into action.

Energy efficiency through appropriate technologies and practices based on conservation is a must. This is equally applicable to our energy hungry industry and transport sectors, and our individual consumption patterns. At a strategic level, settlement patterns, transport services, and a techno-legal regime is important. At a practical level, practices followed by individuals are equally important.





STANS INC BOILING POINT



# 3

Remember reading that highly objectionable, yet arguable statement in school, that was later reiterated in college and you might still continue to hear the echo of yesteryears even now—“You are what your environment makes out of you and that applies vice versa!” So clichéd in its resonance, yet so apt! When we want to be ‘one with nature’, the nature needs to be equally appealing too, but that by the farthest stretch of anyone’s imagination is dependent on us as well. Natural Environment Conservation can be understood perhaps in only one conclusive statement—“What you sow is what you reap!”

# NATURAL ENVIRONMENT CONSERVATION

## “ Basking in the spirit of the greens... ”

If it wasn't for the natural environment we conveniently find ourselves in, sustainability as individuals or for that matter as a species would be more than questionable. Our natural environment is our haven and our saviour. The green blanket allows us to lead a cushioned life while judiciously containing the harmful gases that trigger climate change. One of the most publicly talked about, is the need to save the coral reefs. According to a report written for the Pew Center on Global Climate Change, it's been deduced that more than half of the world's coral reefs will be damaged beyond repair by the year 2100 unless sincere efforts are made to control the damage they are set to face. Coral Bleaching, mangrove destruction and the danger of extinction that animals face are only few of the many problems that we need to deal with at face value. The availability of examples and case studies that directly affect the natural environment are in abundance, however, we have generated a few that are powerful reminders of how there is an immediate need to court the climate change policy and bring it to the implementation stage for a far more secure and livable future.



**Case in point**  
***Sunderbans***

Sunderbans is the world's largest mangrove ecosystem spread over an area of 9,630 Sq. Km. in India. Apart from being a unique mangrove ecosystem the region supports one of the highest densities of the Royal Bengal Tiger. Climate change has led to increased salinity and higher tidal surges, permanent submergence of land masses, increased vulnerability of communities which can have a serious impact on the ecosystem and biodiversity of the area. Recent research based on satellite imagery has revealed that the sea level is rising in Sunderbans at an average rate of

3.14 mm a year. A rise of up to 1 metre is expected to inundate about 1000 Sq. Km. of the delta. In the past two decades four islands (Bedford, Lohachara, Kabasgadi and Suparibhanga) have submerged with 6000 families rendered homeless. Scientists from University of Calcutta and Jadavpur University have predicted that one of the largest islands (Sagar Island) will lose at least 15% of its area of habitat by 2020.

(Mangrove wetland is a multiple-use ecosystem, covering 8% of the world's coast and 25% of the tropical coastline).


## Case in point Kullu

Once known for its apple farming, Banjar nagar in Kullu District of Himachal Pradesh is no longer entitled to that descriptor thanks to the present climatic conditions. While Banjar, with a population of approximately 51,765 has good infrastructure in place along with all basic facilities available to its people, farmers have not been able to grow any apples due to less snowfall and delay in rainfall. Farmers have lost their profit, due to shift from fruits to vegetables in these areas. People are changing their core functional area from farming to business etc; however in areas which are at higher altitudes, farmers have made money out of this shift in the weather. Moreover, the glaciers are melting due to increase in the temperatures leading to frequent flash floods.

What's more, the same pattern of climate change was also observed in Bajaura and Nathlaih, and in the surrounding Panchayats of Banjar.

As a result of the shift in the weather cycle, people are beginning to change their crops.

Dabe Ram, 33, a farmer by profession has shifted to vegetables, like cauliflower, garlic and fruits like plum, apricot etc which has positively affected his profit margin. It has been observed that earlier apple orchards could be seen at a height of around 1200m like Banjar, but now these have shifted to the height of 2000m and above (places like Manali in Himachal Pradesh).



If we would get timely support or guidance from the Government, then we would be better prepared to face these climatic changes...

*Gumnam Singh, Community leader and farmer, Banjar*

## Case in point *Ladakh*

Researchers contend that most of the Himalayan glaciers will disappear before 2050. The Ladakh region of the Indian Trans-Himalaya is as affected by these climatic changes as other regions across the country. Recent studies at different stations in the region have shown that the temperature in the region is increasing annually by almost 0.20°C. Climatic models predict that the earth's surface temperature will increase by almost 5°C by the end of this century. Glaciers, the jewel in the crown of the Ladakhi Mountains are melting at a fast pace under the intense heat of the sun. A recent preliminary study in the region

showed that glaciers are retreating at an alarming rate of 7-10 metres per year. Flashfloods have become a nightmare, moreover, the unprecedented heavy rain in 2005 and 2006 affected thousands of people as floods washed away agricultural fields and claimed more than a dozen human lives. The redeeming feature in all this is that Hydel projects are being installed to generate electricity. Wind energy, especially in the eastern plains, touted as being another option which could be explored.

(Courtesy Tsewang Namgail)



## Case in point *Orissa*

Ever since 1998, the heat wave in Orissa is on the rise as a result of climate change. The scorching heat has led to various cardio vascular ailments such as high blood pressure and heart attack. The poor are the worst hit and the only reason why they are still hopeful is because of the bonding within the community, and the meager support system from the state government.

The State Government has also requested the Central government to declare the heat wave as a natural calamity and provide assistance, but have received no response so far. The families of the victims have to depend on a paltry Rs 10,000 ex gratia disbursed from the Chief Minister's relief fund, which only takes care of the funeral rituals of the deceased.

"Our future generations will have to pay a heavy price if the Government does not come forward to protect its environment and vast stretches of land."

*Biswajit Mohanty,  
Eminent Environmentalist*



## THE CATALYSTS

While most of us would love to come up with umpteen reasons for the disaster stricken state in Orissa and could even go so far as to say that the strokes are a natural calamity of sorts, what cannot be dismissed so easily is the fact that the massive industrialization at the cost of cutting down of vast stretches of jungle is also responsible for the soaring temperature. The massive mining activities in the coal belt of Talcher have also led to the rise in temperature. Official sources of Orissa University of Agriculture and Technology (OUAT) have confirmed that the average temperature has soared after 90's. While it had taken some 40 years, from 1950

to 1990 for the temperature to go up by a degree, the same degree of temperature has gone up by 1 °C within 13 years from 1993 to 2006.

What needs to be further taken into account is that the retention of heat in the atmosphere is further aggravated due to the effect of aerosols. The tropical summer heat thus gets intensified and gets converted to a life threatening heat wave. Intense heat wave leads to loss of water from the body through sweating. Excessive sweating leads to low blood volume causing blood clotting.

According to the cardiologist of Capital Hospital, Bhubaneswar, Dr. S.N Murthy said the sudden death due to sun stroke could be attributed to many reasons. The blistering heat on many occasions, leads to sudden death which can further lead to heart failure. Dr. M.P Tripathy, agreeing with Dr. Murthy states, "Though no data bank exists on it, I can definitely say there has been an increase of heart stroke by 15 to 20 % in Orissa in the last 10 years due to intense heat wave". The climate change has also led to a super cyclone in 1999, drought in 2000, floods in 2001, 2002 in 2003. After 1998, the State has witnessed the heat wave, a new phenomenon. Due to the climatic changes, the temperature of Titlagarh even crossed 50.1 °C on June 5<sup>th</sup>, 2003. The temperature of the coastal belt, including the twin cities sometimes crosses 40 °C. The thermal power production in the State, which leads to emission of gases makes the future look even more daunting. The State produces nearly 5,000 megawatts of thermal power; however it plans to shoot this up to approximately 35,000 megawatts. This spells only one thing for the future—disaster.



The Government has, of late, decided to come forward with remedial measures to contain the disastrous consequences of climate change. The Government has directed all the public sector companies to put stress on afforestation. They have even threatened not to renew the eco license until it goes for massive avenue planting.

In Banjar, Himachal Pradesh, through technical and non technical support of the government watershed programme, along with rainwater harvesting, bio gas plant installation and vermicomposed culture have been adopted. The villagers are finally getting their life back on track, thanks to these small but significant efforts made by them.

Kashmir is one of the few regions in South Asia which has not faced large scale hunger since the last half a century or so. What's worth noting is the production of oranges in the valley now! The main reason for this has been good food security due to highly fertile land and abundant water resources. Although the plant's ability

to adapt to Kashmir's climate accounts for some of the orange tree's success. Zargar, who teaches at Srinagar's Sher-el-Kashmir University of Agriculture, says the oranges are a sign of climate change—near the foothills of the Himalayan mountains. Zargar says that average annual temperatures in Kashmir Valley have risen by at least 3°C, and up to 8°C in some areas.

The Chipko movement in Uttarakhand is an example of the community coming together for a common cause and willingly adopting non violent yet effective ways to do it. Another commendable initiative is the Van Panchayat. Van Panchayats (forest governing councils) are an innovative institutional instrument that have been very successful in its purpose. Van Panchayats are constituted on the pattern of the Panchayats, the rural local governments. The elected Van Panchayat is responsible for the maintenance of the village forest land. It monitors and controls all activities in the forest, including woodcutting and even grazing of cattle. One of the ways in which partnership can go a long way in



remedial measures is by following the example of Dasholi Gram Swarajya Mandal (DGSM)—a community based organization that has grown out of the Chipko movement and has been the force behind the continuing efforts made to promote afforestation. The DGSM is a fine example of proactiveness and initiation by the locals itself since the local villagers are the ones who are monitoring the afforestation program through satellite imagery based remote sensing carried out by the Indian Space Research Organisation (ISRO).

A Green policy that is ingrained as a thumb rule is a necessity more than just a need for a country the size of India. Indigenous alternatives to tap into, is what we should be looking to integrate in the future. For instance, while wind power may constitute only a minority sector, India with its extended coastlines is one of the most ideal for harnessing wind power making it one of the most easiest ways to tap into the natural environment's resources!

Civic society partnership can go a long way in sustaining and safeguarding the natural environment in the best possible manner, in the same way civic society had come together at the time of crisis (post the 2000 Tsunami.)







# 4

Now if only the three li'l pigs had joined forces to make that big bad wolf beat the dust at the first go, the Three Little Pigs wouldn't have managed to be simply blown away by the wolf's outburst! It's wonderful how the simplest of tales, manage to say really big things without making it seem like they are trying to dispense sermons. The appropriateness of built environment is unquestionable. It provides a roof over our head and the comfort of being in a cocooned and safe environment.

## APPROPRIATENESS of BUILT ENVIRONMENT

## “ The glass ceiling can make you crash and burn! ”

It's unquestionable how important the built environment is for safeguarding and protecting us from the vagaries of nature, and making life seem less overbearing in spite of the challenges we face on a daily basis. However, it's not like the built environment that becomes ever so important for us is appropriate for the environs since it may often increase the natural threats that it protects us from. While the urban segment of the country is perhaps the best example of the 'inappropriateness' of built environment we have scoured for examples in the interiors that are as daunting as their urban counterparts!



An 'appropriate' example by which we can lead is by comprehending the way in which people like Laurie Baker have pioneered a niche for themselves. Laurie Baker writes, "Our 'backward' ancestors had learned how to live with and cope with the problems of climate. They had teamed that a pitched or a sloping roof lessened the effects of all these hazards. They knew the movements of air currents and placed their wall openings almost at ground level. They knew that hot air rises and allowed it to travel upwards from the low eaves to the openings at the ends of the high ridge. They understood and applied principles of insulation; their roofing materials formed hollow cellular protective layers and their storage spaces provided insulation from the midday sun." The thing about Laurie Baker's approach to building is that it needs to be applauded for all the sincerity he sees it with and therefore imbibes in it while doing his work. He understood that in a country like India, no one has the right to squander or waste, or use unnecessary money or energy. As a parting shot this quotation sums up Baker's ethos... "Cost-effective houses are not just for the poor, they are for everyone. The equation that a cost-effective house is a house for the poor, implying a bad looking house, can definitely be proved wrong. Isn't it the responsibility of the upper and middle classes to stop indulging in extravagance and make better looking houses instead? This entire classification is wrong."

The thing is, we can either resort to giving up in despair or in a more promising fashion... aim at looking for ways in which we can make do with whatever little we have and turn it around in a fashion which incurs the least amount of damage to our surroundings.


## Case in point *Jadera*

Jadera and the surrounding panchayats of Chamba district in Himachal Pradesh are considered to be extremely fertile and green. Significant changes in the climate have occurred in the last 20 - 25 years, due to natural and forced climate change in the environment. The Ravi basin has in addition suffered a severe setback due to the man made activities in the name of development. In the wake of development, making roads and generating electricity etc, the natural

environment has taken a backseat with the built environment becoming the prime focus. Oak trees, which can aid in water conservation, have had to bear the axe of deforestation. To make matters worse, Chid (Pine) trees were planted, which are not advisable in this belt according to environmentalists and conservationists since they don't allow any other plant to grow in their surrounding area.

We are already trying to deal with the repercussions of climate change. If the Government doesn't take any necessary steps in the right direction, then we may be disaster struck at any point in time!

*Ratan Chand, Paryavaran Chetna  
Kendra, Saho, Chamba*

A photograph of a dirt road winding through a deforested area. In the background, there is a lush green forested hill. The foreground shows a dirt path with some debris and a small structure partially visible. The overall scene depicts the impact of deforestation on the local environment.

For 63 year old farmer, Maulvi Ghulam Mohammad, of Jadera Village (District Chamba), climate change is the most upsetting thing in the world! He has been farming for around 45 years, and has observed major weather changes in the last 20- 25 years. Due to gradual reduction in rainfall, snowfall and the drying up of water bodies, he has lost crops in bulk and his fodder has also reduced to 40% of the earlier output. A vicious cycle has unveiled its ugly head in the process—his wheat crop did not get enough cooling temperature, and the rice didn't get sufficient amount of water. His livestock suffered as well cut down of fodder for them. What makes the situation even worse is that human induced activities like deforestation, mainly due to the upcoming hydro electric projects and new roads construction etc, have led to forced climate change here.

The food chain is also in a fix since once the forest cover disappeared, terror of lions and monkeys increased because these animals while looking for food migrated towards already inhabited areas. While earlier (in the last 10 years) there were only 2 incidents of man eater animals that were recorded, in 2007 twelve people were under attack, due to this. The built environment has led to a lot of unrest in the villagers' life and caused major upheavals which have left them quite helpless in the process.

## **THE CATALYSTS**

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Under the umbrella of development, manmade activities have led to deforestation which has subsequently disturbed the ecological balance of the area as well, and caused havoc in people's life.



Studies have shown that most of the glaciers in the Himalayan region are shrinking at an accelerated rate. Chobia, Kugati, Manimahesh and Khundi Maral glaciers in Chamba Block have reduced in size and thickness according to recent studies and research. This recession has led to frequent flash floods in the region. Rainfall has reduced by 1/3rd in the last 10 years time. In 1997 rainfall in Chamba District was 2365mm, which later reduced to 1568mm in 2005 (as per Statistical Abstract, Chamba).

In addition to all this, very little of the forest cover is now left. As per census data, for ex- population of Chamba

Block—it has increased 17.2% in the last 10 years. And local people's perception is that there is reduction of approximately 25% in forest area in these years. Further, there are examples of road construction like Kareenna road from Saho to Paroatha, which led to forced and unplanned cutting of forests. Moreover, new power project Hull 1<sup>st</sup> is also coming up in this block. All this will lead to further deforestation and reduction of water level in the natural course of river Saal. Similar climatic changes have also been observed in surrounding Gram Panchayats of Jadera and Saho.

The Government's Watershed program, is a great success here since with the increase in afforestation, people have stopped thinking of migrating now. The government has also introduced another program, called "Him Oorja". Under this the power is generated through micro hydel projects. These micro hydel projects divert the water and fall separately, generating power. At the local level, villagers have started generating power with the help of bigger water mills, called 'Pan Chakki'.

The interesting thing about coping with the inappropriateness of the built environment is that we can often, through small yet solid initiatives turn around things for the better in the long run, just like the people of Jadera did in Chamba. The Jadera Panchayat is now promoting ecotourism, giving the place a complete makeover without waiting for government intervention.

The subsequent action plan in place needs to increase the level of symbiotic relationship between our built and natural environments. Sensitive design of buildings, settlements and landscapes should balance between hard and soft spaces and depend more on natural microclimate control instead of energy devices for creating thermal comfort.

A page of history can be torn from the rich traditional practices in the past, and augmented with appropriate technologies to make the result environmentally sensitive yet comfortable and disaster resistant. Waste generation should be minimized, and waste recycling and management should be made a priority within management of buildings and settlements, both in urban as well as rural areas.



Photo : Sarika Gulati



SEEDS INDIA, BOILING POINT

# 5

If it wasn't for the innate sense of security that one comes from knowing that they are in no immediate danger of being penniless and starving to death, at the most, 70% of the population would be swinging in their life without a days work! On the other hand, work comes as an occupation that one can immerse themselves in without being deemed super obsessed! For a country like India, with an ever growing population, livelihood security is a pretty rudimentary necessity!

**LIVELIHOOD SECURITY**

## “Security instills a passion for seeing the goodness in others...”

There are some universal facts that remain constant for all and become probable benchmarks. Amongst them, economy, and the growth and fall of it, is something that directly or indirectly affects the common man. Therefore, it should come as no surprise that climate change doesn't spare even the economy and can become the harbinger of bigger problems. It's not news that the mainstay of the Indian economy is still heavily dependent on agriculture, and within that, rainfed agriculture. The farmer's suicide during the most pitiful production seasons within the subcontinent are some of the grave challenges ahead of us due to the severe changes in climate. The impact of climate change is already being seen in many primary sector economies. The same impact has deprived the common man, who happens to be the worst hit of the lot and suffers in its holocaust...



"Reuters/Parth Sanyal, courtesy www.alertnet.org"



### Case in point *Kendrapara*

Perennially threatened by saline ingress and cyclonic storm, the marauding and choppy sea waters have been constantly eating into the district of Kendrapara along the eastern coast of Orissa. Sea erosion has led to the alarm bells ringing. To add to the woes, there is palpable change in climatic pattern. The changing pattern dates back to a decade with things assuming disastrous proportion day after day. The northern tip of this region is constantly devoured by the imposing sea waves. The threat of ever-recurring cyclone haunts the inhabitants. Ever since the 1999 super-cyclone that had wrought havoc, low pressure induced depression has become a permanent feature in this region. The saline ingress had battered these areas as cyclone struck in 1967, 1971, 1982 and 1999. Local perception is that sea level is on the rise in these areas. The intensity of erosion differs from place to place. And

the ground reality is grim along the Satabhaya-Kanhupur coast which has been bearing the maximum brunt of sea erosion over the years. Erosion is steadily eating up the two-still-existing human settlements ---Satabhaya and Kahupur. Over 250 families of these threatened villages are literally living on the edge.

Encircled by thick mangrove vegetation and swirling seawater, the place was calm and a serene natural abode for anyone looking for being one with the beautiful landscape. The economy too was rich. However, the revenue records itself speak of the extent of erosion-induced devastation. As per the pre-independence land records dating back to 1929, the cluster of seven hamlets measured 320 square kilometre. Now it is reduced to less than 100 square kilometre as per 2001 land records of Rajnagar.



According to the environmental activist, the first symptoms of impact was observed roughly thirty years back when plants were affected first—One such example was that of the coconut trees, which were the first to feel the strain. Even the coir industry of Kerala has faced a grim impact of the same nature.

## THE CATALYSTS

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Mangrove forests formed about 3/4th of the affected area in Satabhaya, Kendrappa before the soil ingress. However, the felling of mangroves to make way for paddy cultivation became the order of the day in the sixties with the promulgation of the estate abolition Act. In Satabhaya, as in Sundarbans, mangrove too could have acted as a natural barrier in taming the tidal waves which Satabhaya has suffered following the decimation of these tidal forests. The 1971 cyclone gave the most lethal blow! The distance between the sea and the village is just about half a kilometer now. If locals are to be believed, sea water is getting warmer in the region and monsoon has become erratic. There is hardly any uniformity in the rainfall. Frequency of these areas flooded by river water has also gone up. Flood had wrought its fury here in 2001, 2003, 2005, 2006 and 2007.



The underground water in the villages has turned saline due to ingress of sea water into groundwater aquifers. The paddy crops have also been severely affected. The soil moreover is extremely saline due to the sediments left behind by the sea water and has become unproductive. Repeated damage to crops has left the villagers economically crippled since most of the villagers here are farmers. Some of the farmers have even tried to cut their losses by selling off their farms to shrimp farmers; however, there is absolutely no sense of security that drives the villagers anymore. The livelihood of the people of Satabhaya is on the margins.

The weak economic condition and increased vulnerability has also affected the social life in the

village as the men folk in the village have problems finding a bride since people are not ready to marry off their daughters into the Kendrapara area. This has considerably delayed the age at which the men get married. Since no help has come from the government in the area the people are cynical and pessimistic about the future.

Apart from periodic repair of saline embankment, no concrete measure to tame the sea has been attempted. As per saline embankment official records, Rs. 27 lakh were spent for maintenance of erosion prone embankment at Satabhaya and Pentha. One only hopes that the money allotted works towards catering to the villagers' needs than catering to the officials greed!





Since no such concrete evidence of government help has come out of the block instead of just figures about the money to be allotted there's not much option the villagers are left with. Some of the villagers have migrated from the area, while others are trying to cope with the advancing sea by relocating themselves within the area. However, they have limited options since they are enclosed in a wildlife sanctuary where development activities are not permitted.

The shifting rainfall timings are affecting paddy production in South India, the most minimal rise in temperature is having a devastating impact on apple orchards in Himachal Pradesh, and pest infestations are affecting coconut yield in Orissa.

Many other examples are available of adverse impacts on crops even in spite of improved seeds, fertilizers, pesticides and crop management technologies. This, combined with the absence of credit and insurance options for farmers, has been leading to an alarming number of farmer suicides in Maharashtra, Karnataka and in other vulnerable states. Livelihood security is an urgent issue to address — Livelihood options, insurance and credit programmes form part of this. Besides this, climate dependent livelihoods need to be prepared for climate variability that is set to become a norm in the future. Scientific research will have to support this mission though, as will the government during the implementation and execution stage.





SEERS INDIA, BOILING POINT

Photo : Sarika Gulati



# 6

The mid 14th century saw a very dark epoch—‘The Black Death’! The Black Death, or the Black Plague, was one of the deadliest pandemics in human history. The pandemic is thought to have begun in Central Asia and spread to Europe during the 1340s. The total number of deaths worldwide is estimated at 75 million people, of which 25–50 million occurred in Europe. It may have also reduced the world’s population from an estimated 450 million to between 350 and 375 million in 1400 according to data and estimates. You perhaps question the reason for this enthusiasm to dig out the past and remember it—the fact is, that health safety should be a major and national concern so that we may be able to safeguard our future and learn from our past!

**HEALTH SAFETY**

# “Life is not worth compromising... ever!”

It's strange how health has not really been adequately recognized as a sector which might be threatened by climate change. It's perhaps because of the obvious visual calamities that seem more overwhelming and overbearing than individualistic isolated ones that are not so obvious at close inspection but can fracture us forever.

The shift in the outreach of vector borne diseases is being felt in most parts of the world, but it hits harder in poorer societies that are ill equipped to prevent and fight illnesses.

The widespread spur in the rate of infections can be quite alarming, especially when it's closer home than one would like to acknowledge or imagine...



## Case in point *Surat*

Surat, in the state of Gujarat, has a population of 2.7 million according to the 2001 census. Its major industries include diamond polishing, diamond exporting, and the production of textiles, yarn, dyes, and other chemicals. Surat Special Economic Zone (SurSEZ) is the country's first and only private sector SEZ set up by Diamond and Gem Development Corporation (DGDC). In the last decade the Western region of India has become a disaster hotspot with a number of disasters striking the area with alarming frequency. There has also been an increase in the intensity of these disasters between 1991 and 2007. Scientists and environmentalists are of the view that the increased frequency and intensity of disasters is due to climate change. One of the impacts of climate change has been the increased possibility and spread of vector borne diseases in the region. This possibility became evident

during the Plague epidemic of 1994 in two neighbouring states of Maharashtra and Gujarat. While the floods plagued Gujarat in 1997, the years following 2004 to 2006 have seen a series of disasters like floods and drought that have fractured the very backbone of the city! The past 10 years have wreaked havoc in the city. In September of 1994, a plague broke out in Surat creating worldwide panic. The fear of an epidemic was so intense among Surat residents that within 4 days, one quarter of the populace had fled the city. This exodus fuelled anxiety throughout India, with the fear that plague might be transported far and wide by Surat refugees. Fortunately, the Surat outbreak was diagnosed quickly, and widespread treatment with tetracycline was begun. About half a million capsules of tetracycline were distributed in Surat alone.



**Case in point**  
***Kerala***

Alapuzha, south-western coastal district of Kerala, was highly affected by Chikungunya during July-October 2006, and after that there were sporadic cases that sprouted. The people from Cherthala Taluk were the most affected. It was reported that 80% of the population was affected. In visiting few people from Arthangul and Muhamma like farmers, farm labourers and environmental activists, the data about the issue of flooding and its linkages with Chikungunya were elicited. Incidences of flood in this region were reported in the national newspapers during 1999, 2001, 2004 and 2007 and in March 2008 recently.



Photo : Totipietras/KUNICEF

The Arthangal village is situated in Cherthala south Panchayat of Cherthala Taluk. Since the past three to four years, due to intermittent rains during March and April, the ponds in Arthagnal village have water, which is unusual, since the ponds usually dry during these months. A farmer expresses that these rains have spoiled the produce of cashew nut trees, mango trees and paddy. The Coconut trees,

according to one retired physical education teacher of the local school, who is also a native of this village, have been affected by many diseases in the past 20 years, due to which the number of coconut trees has reduced. Chikungunya has also affected about 80% of the population and the most inflicted among them were women and children.



“Reuters/Peter Smerdon, courtesy [www.aljazeera.com](http://www.aljazeera.com)”

## THE CATALYSTS

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The 1994 plague in Surat, raised many serious questions about the government's ability to manage and control such alarming epidemics. The precipitating factor for the outbreak of plague in Surat was constant rain which lashed the city for more than two months, and led to flooding and large-scale water-logging in low-lying areas. In the summer of 1994 the temperature in Surat touched 50°C. The combination of warm and humid climate provided ideal conditions for disease vectors to breed.

The Doctor at the Primary Health Center (PHC) deduced that the outbreak of Chikungunya in Kerala is due to the virus that gets transmitted from people who have travelled to this region, although she says that in Arthangal itself, the vector that could inflict dengue fever is in abundance. She further stated that the rats after eating the coconut discard the shells all over the village during the rains - the static and stored water therefore becomes the medium in which the vectors are born.





Climate change, whether natural or manmade, may already be spreading disease and pestilence, according to a host of new studies. Underlying all these outbreaks is the same Darwinian mechanism: unusual weather such as dry spell in wet areas and torrential rains in normally dry spots tends to favour so called opportunistic pests—rodents, insects, bacteria, protozoa, viruses—while making life more difficult for the predators that usually control them. Episodes of extreme weather are routinely followed by outbreaks of plagues, both old and new. (Source: [www.time.com](http://www.time.com))

The pneumonic plague epidemic in Surat was preceded by epidemic of bubonic plague in Beed, Maharashtra.

Subsequent to the plague a massive clean-up of the city was undertaken and the city administration was revamped. In two years Surat was transformed from one of the filthiest cities to the cleanest city. At the heart of this transformation was the major drive for slum improvement and solid waste management in the city. The cleanup of the city helped to ensure that the breeding places of disease vectors were destroyed. Such measures are a necessity under the changed climatic conditions.

In Kerala, the government has taken remedial steps to spray insecticide in the stagnant water and have issued information brochures and displays on practices to reduce Chikungunya like covering the wells!

The thing about facing such odds and massive outbreaks within a region is that it allows us to cope with the aftermath of the worst disasters and mentally prepare ourselves for the future, however distressing the situation might be!

There is absolutely no question that even the most basic elements like water and sanitation demand our attention in the state of things at the moment. Since 1992, countries around the world have marked 22<sup>nd</sup> of March as World Water Day, so that they can promote awareness and understanding about issues related to water. Hygiene and sanitation are not frivolous sectors when you begin to consider the damage they can inflict on the masses at one go. The only way out of a health hazard is by attentive cooperation and unanimity in decision making.

The spread of dengue and chikungunya is increasingly becoming a cause for major concern since the past few years. Diseases are making a comeback, because of the increased resistance to drugs that used to be effective earlier. Investments need to be made urgently in identifying, isolating and controlling the spread of climate related diseases, and in preparing the vulnerable communities for prevention and effective response to emergent health problems.



Photo : Sarika Gulati



SEEDS INDIA, BOILING POINT

# 7

It's given that most of us at some point or the other have marvelled at the glorious histrionics of yesteryear civilisations, and amongst them the Harappan Civilisation, gives us immense pride when we study how magnificent it was. The one feature that leaves everyone in awe even now - the roads and intersections that cut at perfect right angles and a drainage system that should put today's civilisation to shame! The choice is, after all, always a perfect bailout where planned urban development is concerned. Do we then still want or should choose to compromise with the planning of the vertical and horizontal expansion?

**PLANNED**

**URBAN DEVELOPMENT**

## “ Horizontal or vertical? ”

It's estimated that over half of India's population will live in the cities within the next two decades. More than half of these city dwellers will live in sub-standard houses and settlements because of the burgeoning population and the inadequacy in planning for the future. In metropolitan cities such as Delhi and Mumbai, an alarming proportion of up to three fourths of the population already lives in slums and other sub-standard housing. The pace at which urban planning and development is being taken up in the country is abysmally poor. It's a pretty depressing state that we have managed to shove ourselves into, with every decade of development. While the economic rise may seem to be our 15 seconds of fame, the mess we have seemed to gotten ourselves into with the land crunch and the 'vertical or horizontal rise dilemma' is a tad unnerving!



## MAXIMUM CITY...can Stretch Only Too Far!

### Case in point *Mumbai*

Greenpeace has warned that Mumbai will remain unprepared and vulnerable to climate related chaos, if it doesn't acknowledge climate change and take steps to fight it. Even as the city took stock of its capacity to stay afloat through the monsoons and all fingers pointed solely at the municipality, Greenpeace noted that band-aid solutions that focused on drains would not solve Mumbai's recurring monsoon blues. The impacts report

released by the Intergovernmental Panel on Climate Change (IPCC) in April 2007, pointed out that the scientific body had predicted a 90% probability that weather events and extremes will become more frequent, more widespread and/or more intense with increase in temperatures causing severe disruptions of settlements, commerce, transport and societies due to flooding—a clear threat for a city like Mumbai.

A study by scientists of the Columbia University looking at 'The vulnerability of global cities to climate hazards', has pointed out that despite Mumbai being one of the few Indian cities with an elaborate disaster management plan in place, the challenges posed by climate change, especially flooding are unlikely to be met by such systems alone.



Photo: Sarika Gulati

## THE CATALYSTS

There is an immediate need to take stock of things and comprehend the reason behind the disastrous effects of such unplanned urban development like that of Mumbai in the present scenario. Mumbai's planners and the State Government must recognize that carbon dioxide emissions from fossil fuel based infrastructure is what is actually triggering climate change.

What remains even more shocking and demonstrates an acute lack of foresight are the 'Master Plans' that are being devised. The plan in fact encourages the establishment of non-labour intensive industries instead of creating job opportunities in villages. The way the plan aims to rid itself of the migrant population is by flooding the city with capital intensive and sophisticated industries like Information Technology instead of labour-intensive industries, so that the city

comes across as one which requires high skills, therefore making the survival of the migrant labourers near impossible. At the face of it, this seems like a preposterous idea since instead of finding adequate alternatives it looks like a move in the wrong direction which can lead to crime, frustration and an overwhelming sense of helplessness amongst the migrating populations.

While clean drains, good monitoring systems, etc., are relevant and vital concerns, none of this will prepare the city to face the intensity of future monsoon onslaughts if global temperature rise is not kept below 2°C. The city needs to pull its socks up as do other urban establishments and metropolitan cities across the country!

## TRIGGER of CHANGE

It's critical that radical steps be urgently taken to put the urban development process on track. Peri-urban areas need to be included in this effort, since these are the areas where a majority of informal changes are taking place right now, which will inadvertently become difficult to manage problems in the future. Mass migration to cities that puts added pressure on the infrastructure can only be contained when there is an alternative that the people have in hand when it comes

to making that move for livelihood security. The most shocking reminder of how climate change affects such a wide diaspora of things is that at a basic level all of the issues are interconnected and if one is deemed unfit there is a ripple effect that follows suit. Focus on urban poor and their livelihood, housing, health, education and human security needs should be an integral part of the urbanization process in the country, which is so far lacking in nature.





"Reuters/Singer, courtesy [www.alemet.org/](http://www.alemet.org/)"





# SEEDS INDIA, BOILING POINT

## 8

Post Mumbai Floods or the Rajasthan Floods, people have voiced in unison their one concern. How do we reduce the risk of such disasters and how well do we prepare in advance for such calamities that although, might seem unexpected, yet, are a natural extension of the way we have treated our environment over the years? How do we best contain the outpourings of an impending disaster?

**DISASTER**

**RISK REDUCTION**

# “Prevention is ‘always’ better than cure”

Every action has an equal and opposite reaction; therefore every step that we willingly take into the unknown demands Plan A and Plan B, if Plan A doesn't really do the deed, enroute to Plan B seems like the most logical take! Not that this is to say that Disaster Risk Reduction is a hit and miss that we should use to suit our fancy. The point that we are trying to make is that 'preparedness' can be the only logical solution for impending disasters!



The role of the civil society becomes even more prominent in states where governments do not have sufficient resources. South Asia is the most disaster prone region in the world. The usefulness of CBDM (Community Based Disaster Management) approach helps in reducing disaster impacts and calls for its greater recognition and institutionalization within the disaster management framework. (for instance the work undertaken by SEEDS in the Saurashtra area to spread more awareness)

Climate variability is leading to, and in future will increasingly lead to, catastrophic events due to extreme weather conditions. Heat waves and cold waves have taken away human lives in spite of improved technologies and understanding of scientific tools. Unpredictable and unprecedented rainfall shifts are leading to floods and droughts in areas where they are not expected. It's expecting the most unexpected and being 'prepared' to deal with it which gains significance now! That's the reason why there is an acute exigency to learn and follow by example. And that's the reason why we have dug deep for these...

# THE AFTERMATH of the ONSLAUGHT!


## Case in point *Barmer*

August 2006 saw unprecedented rainfall and subsequent flooding in several villages of otherwise drought stricken Barmer district of Rajasthan in Western India. No one was prepared for such a disaster that wreaked havoc in the district making things all the more worse since there was no coping mechanism in place! Heavy monsoon rains started on 16<sup>th</sup> August 2006 that drenched over hundred villages in the 12 odd districts. By midnight of 21<sup>st</sup> August 2006, Barmer had received 577mm of rainfall in three days,

300mm more than the annual average rainfall of 277mm. The structures made of mud were badly damaged. The damage caused by the floods was even more aggravating because houses in this region are constructed in depressions and low lying areas between sand dunes in order to protect them from sandstorms. This worked to their disadvantage as these low-lying pockets got flooded first, and due to the impervious sub-soils, the water stagnated for weeks here.

Floods were really damaging for the houses, life and infrastructure as they were really quick and no one was prepared for them.

*Mangu Singh, 67*



Pushpa Devi, who had just barely entered her teens, was forced into marriage. Since she lost her husband to an accident, and was solely responsible for bringing up her two children, she had to make provisions for a roof over her family! When she had just about begun to cope with her husband's loss and was getting her life back on track, she was again rendered hapless when the floods razed the house she had made for her small family.

One of the villagers from Barmer recalled a similar event that took place about 75 years ago...  
"The village did not have much human or livestock population then. So, there was little damage. The scale of flooding was also much less. The village was deluged with ratadiya magra (red-coloured river in local language)."

Megha Ram, 96

## THE CATALYSTS

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"The floods ravaged arid Gujarat, and neighbouring Maharashtra, while usually-wet Assam reeled under drought and extreme weather conditions. And worldwide, the frequency of such extreme events is increasing because of climate change," says environmentalist Anupam Mishra. Similarly, in July 2003, UN's World Meteorological Organization had warned of an increase in frequency of extreme weather events because of climate change.

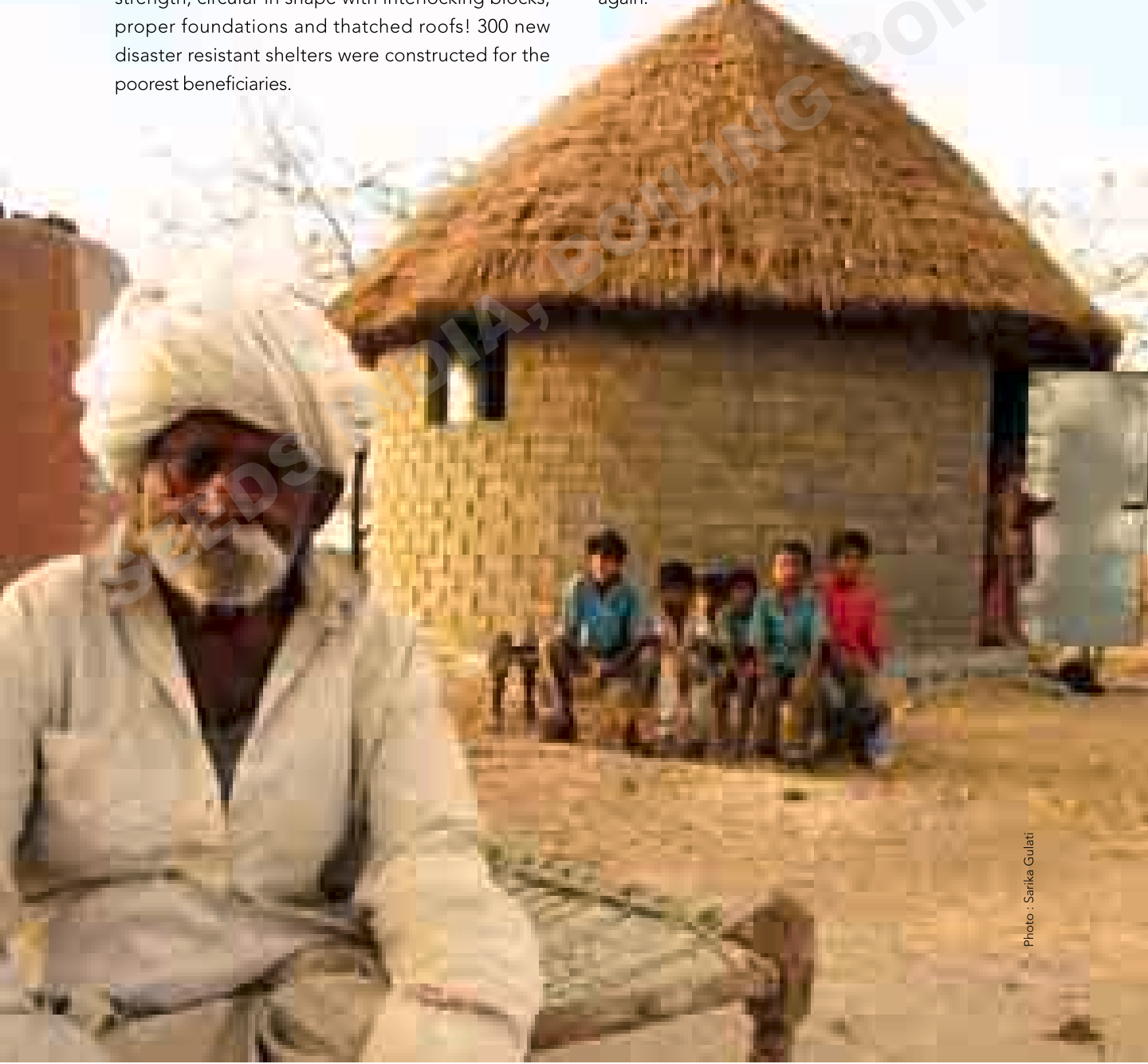
The deluge in Rajasthan was caused by a low pressure zone over the area, itself a result of extreme heat conditions, experts note. Low pressure area in deserts that results from extreme heat are referred to as 'thermal low' in meteorological parlance. Such conditions can also be caused by global warming.



# LEARNING to get LIFE BACK on TRACK!

SEEDS in partnership with Christian Aid and ECHO (European Commission Humanitarian Aid Department) constructed 300 houses across 15 flood affected villages to meet the immediate housing need. The initiative was primarily aimed at marginalized and socially excluded families that had small land holdings and no belongings to rebuild. Women headed household and people with disability were the other groups where the intervention focused on. Houses were made of mud that was stabilized with 5% cement, compressed for strength, circular in shape with interlocking blocks, proper foundations and thatched roofs! 300 new disaster resistant shelters were constructed for the poorest beneficiaries.

Building disaster resistant houses that are as close to the traditional ones as possible was not the only aspect of Barmer Ashraya Yojna but also the intervention aimed at rebuilding lives and livelihood. SEEDS engaged local masons at all levels of the recovery process. Rain water harvesting, a traditional mechanism, was formalized and propagated right through the project to ensure impacts of local climate change shall not be penalizing the community in the long run and rains shall not lead to such catastrophic damage ever again.





Water harvesting and equitable distribution of water are two major approaches that have proved successful in the mitigation of droughts in traditional societies in India, and in the neighbouring countries of South Asia. The water harvesting technologies are low cost, use local materials and labour, are time tested, and are based on simple and easy to understand people's science and therefore can be easily adopted by the government as well in drought stricken areas to contain the effects of the disaster!

Risk Management is the only way to tame a situation from going completely out of hand. Like Barmer and the relief work carried out by SEEDS, there are other organizations that are involved in the rehabilitation process!

Information and Communication Technology (ICT) tools can play a major role in designing early warning systems in disaster prone areas catalyzing the process of preparedness, response and mitigation. Furthermore,

the GIS tool (Global Information system) also allows disaster managers to quickly assess the impact of disaster/emergency on geographic platform and eventually plan the most adequate resource mobilization in the most effective way.

In 2006, when the state of Assam faced drought, and the chronically drought prone state of Rajasthan that faced unprecedented devastating floods--- are examples of such impacts. Increasing sea levels, loss of inhabited land to rising seas, increased frequency and intensity of cyclones and incidence of floods and droughts in short intervals of time in the same locations or in close proximity at the same time, are other such incidences that will have to be dealt with in the near future. There is an urgent need to have a national programme on disaster mitigation and preparedness in place that is based on community based approach and has a wide outreach.



Photo : Tom Petrasik/UNICEF





SEEDS INDIA, BOILING POINT

# 9

Although we in no way can undermine the importance of any human being in the growth of a civilisation or a country, but in the same breath we cannot also begin to deny or contradict the superior role of women and children in its constant growth! While women embody what might come in the future, the children are that impending future!

**ATTENTION to**  
**SPECIAL GROUPS**

# “Take marginal first’s to intergrate All!”

While it is implicit that all programme will have a cross cutting outreach covering all people without bias, there is a need to identify and specifically focus on some especially vulnerable groups in order to ensure that they are able to stay in the mainstream part of our society and are well integrated. Such special groups need to be identified judiciously, and specific actions need to be planned to ensure their security from climate related risks— both direct and indirect.

Socially excluded groups, economically weak groups, disadvantaged women and children need to be the priority now more than ever. The impact, however, is far more devastating on the landless labourers who work in the affected orchards or farms. Similarly, Van-Gujars, the landless herders in the Himalayas, and other such communities are being hit hardest by the changing climate.

In the larger scheme of things it's the role of women and children that is pragmatically forgotten. What's important to comprehend is that if you consider the disastrous effects of climate change, it's women who seem to lose out in this race for survival. Although most policies fail to mention gender when talking about the effects of climate change, a rights based approach needs to be assured to these special groups. During the Tsunami itself, there are innumerable examples of how women suffered because of the gender divide—they did not run for security since they stayed behind to protect their children and the elderly while the men scrambled for a safer place; they couldn't even attempt to save themselves since they were not taught how to swim. A rights based approach to climate change therefore becomes even more crucial to incorporate in the national scheme of things. At least a step in that direction is the least that one can appeal for.



“Reuters/Ahmad Wasood, courtesy www.alertnet.org”



## THE RISING...

### Case in point *Nellore*

Kavali is a coastal Mandal, situated in the northeastern part of the coastal district of Nellore, Andhra Pradesh. On May 3rd and 7th of 2008, the temperature recorded in this Mandal was 44.3°C. A few of the news agencies had reported four deaths in Kavali. Many from this village are employed by the forest department in carrying out the plantation work in the forest. In the recent times many industries have come up in the Panchayat jurisdiction. Many from this village have also taken up casual work in these companies. 'Ada dheba' is the

term used for sunstroke. The villagers have felt that from the 1<sup>st</sup> of May 2008 the heat wave has been extensive, unlike previous years. During 2003, the heat wave had taken three lives in Madurupadu. The farmers in Madurupadu used to cultivate maize and millets after the harvest of paddy in March-April. In the past 15 years they haven't cultivated these varieties because for two consecutive years the rain which used to fall during January failed and the farmers had to face heavy financial losses because of it.

## DON'T SNIP the UMBILICAL CORD!

In Bundelkhand, families are unwilling to marry away their daughters to the men of the village, fearing that the young brides would suffer in the water-parched villages.

Drought induced by climate change has haunted local farmers for more than four years now. For farmers, crops have failed miserably due to the prolonged drought and in the past three years, at least 2000 men and women were reportedly to have committed suicide!

People prefer giving their girls to outsiders as they will suffer here due to water shortage. Women have to travel miles to collect water for their families.

*Rama Bai, 57, Kena Village*

## IMPACT

People have often remarked that they haven't received any support from the external agencies—be it government or non-government organisations with regard to awareness, technical guidance or for that matter basic medical support. In the case of Chellamacherla, they have had to carry the ill or sunstruck in the hot sun to Kavali for medication. The inclusion of these people is far from a reality—sitting quietly on the periphery without any effort made to integrate them into the mainstream. The question is, how long will this exclusion be swept under the carpet and everything else remain a hogwash in the name of development!





## REGROUPING and FIGHTING AGAINST the ASSAULT!

In spite of the heat wave and the water problem in Madurupadu village, there is a bottled drinking water industry here. However it's the villagers who are still trying to make ends meet without any support from government agencies coming forward.

Another way of remodelling the social structure to incorporate women is the striking feature of the Chipko movement—that has not been led by the professional leaders and demagogues, but is actually guided by the common rural folk.

The community grain fund in Andhra Pradesh, serves the critical needs of the poorest and destitute in the community. In the past two decades villagers have moved towards autonomy of food production, seeds, natural resources and their management.

To help women go back to work, Balwadi's have opened across the country in rural districts which act as day care centers for the kids where they are also given a healthy diet on a regular basis. DDS (Deccan Development Society), is a grassroots organisation working with Sanghams (village level groups) of poor women most of whom are dalits. The community grain fund is a part of their project to integrate women in the mainstreaming functioning of things.

A rather cursory glance at UNICEF's report on applying human rights approach brings us to the children's right which recognises and facilitates the right of children to participate and have their voice heard, according to their evolving capacities. Children's participation includes their involvement in the social, cultural and political spheres of life.

Within the families of the landless workers, the women are the worst hit since they ensure that they first feed the men and children, and they themselves consume food last. Dwindling resources are an additional burden on women when gathering water, fodder and fuel-wood. Eroding financial security of the family even puts children and young people, particularly girls, at risk of human trafficking. Enough reason perhaps, to make anyone sit up and take notice of the current discriminatory scenario.

SEEDS INDIA, BOILING POINT

Development means using your traditional wisdom to adapt to change.

*Chandamma, beneficiary of the  
Community Grain Fund*







# 10

A chain reaction with positive implications is always a good thing! Especially if the chain is seemingly beneficial for the future and allows everyone a greater understanding of how to administrate things better! Education is the answer to almost everything—you pose a question, you have answer and you familiarise yourself with something brand new and exciting! Education can never ever be vacant, it leads us to hope and the belief that there's always an answer to every question! Needless to say, education on climate change is the first pragmatic step towards meeting many important goals in the future!

**EDUCATION on  
COMBATING CLIMATE CHANGE**

# “Awareness is the one and only way!”

If we would have left everything which concerned our growth to someone else, the shiftiness in the interests would be a bone of contention. Especially since it would seem like you are escaping the obvious and essential, and waiting for the opportunity without attempting to create your own. Similarly, governments alone cannot combat climate change. A concerted effort by governments, corporations, the scientific community, and the common people will be required to create a significant impact. A few and far in between ways of doing so is a possibility we keep scouting for whenever an opportunity arises!





## BLOOD TIES...

### Case in point *Ellichettladibba*

The source of livelihood of the villagers here is the river and creeks in the mangroves surrounding the village Ellichettladibba, Andhra Pradesh. The villagers have experimented with agriculture, moved on to aquaculture and then come back to farming. The rising Krishna River, has substantially affected the villages in terms of loss of homestead and farming land to the east of the village. There are about 400 families in the village, all of whom are from one single caste of Agni kula kshathriya raju. Before 1977 agriculture was extensively practiced — they pumped water from the Krishna River and were cultivating paddy and

vegetables. Apart from agriculture they also do fishing in the river and prawn catching in the creeks of the mangroves. During 1977, there was a big cyclone after which agriculture was not practiced at all; they were only 'hunting' in the creeks. Thorn trees that were grown in the agricultural lands were cut and sold. They also made coal out of wood from the thorn trees and sold them. In 1992 aquaculture was started in the village, by turning the agricultural land into ponds. They came to know about aquaculture from the neighbouring villages, as an alternative. That was the first attempt to practice change.

## The AFTER-EFFECTS of CLIMATE CHANGE!

After the 1977, floods the villagers were not able to pump the water from Krishna River to irrigate their agricultural land, as the water would quickly become saline. Until 1992 when they started the aquaculture their main occupation was fishing. The villagers still suspect that the virus that affected the prawn and fish farms in the village could be due to some wind prone infection. But the villagers have not made laboratory tests to confirm what the main cause of the virus was. Although one thing remains clear, the loss of homestead lands and farmlands is directly linked to the rise of Krishna River.





## COPING with it ALL!

The impact of floods in Ellichettladibba is significant. Two years ago Aga Khan Foundation had built a revetment for a distance of 400 metres in the banks of Krishna River to the east of the pond in the village. Therefore, the residential locality of the village has been saved from further breaching. Two years ago the eight acres reservoir was built by another NGO called GUIDE to enhance the agriculture potential in the island. The water to this reservoir is pumped from the Krishna River further inland where the water is still fresh. The village has a committee of elders and knowledgeable people which functions independently from the elected statutory village panchayat. Those elected in the village panchayat are also part of the committee. They are called 'Oor Bethalu'—village elders during earlier days, now this institution is addressed as village committee.

There is a need to make significant investments in the research, monitoring and documentation

of climate change impacts and appropriate responses. Both transferable indigenous knowledge and appropriate technologies need to be studied to arrive at an appropriate mix that will be environmentally, economically and culturally suited to the Indian context.

The knowledge thus generated needs to be deployed at multiple levels - advocacy for appropriate decision-making, dissemination of information to various stakeholders to enable appropriate actions, and awareness generation at public level for required changes in lifestyles and practices. Inclusion of climate change in the school curriculum could be another way to enforce its importance in the long run. Educational institutions have a very strong role to play in this regard, and climate change mitigation and adaptation needs to be an integral part of school and college education, and also of the national school safety programme.



## THE LAST WORD...

The purpose of the Climate Change Report is to instil a sense of urgency so that we can gear up and brace ourselves for what's in store. The time has come for quiet retrospection and thought over what we have made of the world around us and how challenging it is to sustain it. While there are 'n' number of theories and deductions that can be arrived at for safeguarding our future... the thumb rule states the obvious—theories mean nothing if they are not put into action!

We must raise the bar of performance for ourselves and for the government. We must collaborate as

a unit and become agents of collective change. It doesn't take a genius to grasp the reason for the rising sea level, nor is it as hard to digest that there should be some laws in place to limit the outflow of carbon emissions!

The Climate Change Report is meant for the government and the common man so that he/she may sit up and take notice of the world around him/her, look a little closer and lift that superficial layer of false belief to really get to the bottom of the problem. To eventually arrive at a cumulative way of attempting to 'right' the wrongs!

SEEDS is seeking to raise awareness on climate change through its advocacy campaign on combating climate change. A gamut of educational and informational products targeted at various sections of the society is developed under the initiative.

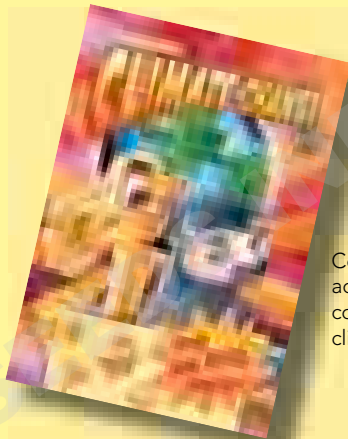
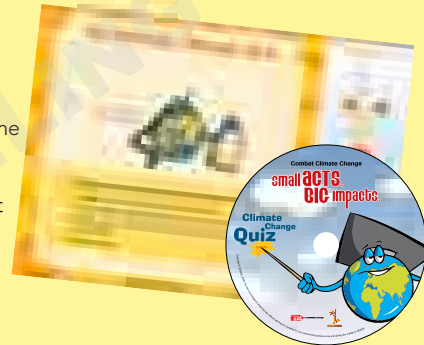


Informative poster on climate change for children



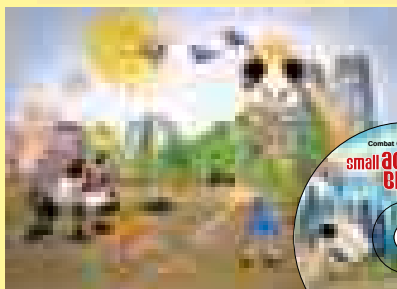
Card Games educating children on climate change

Quiz gauging the climate change quotient



Comic cum activity book on combating climate change

Course Modules on Climate change adaptation and mitigation



Fun animation movie on climate change

Check out the website [www.seedsindia.org/climatechange](http://www.seedsindia.org/climatechange) to know more about our campaign on climate change.

You are encouraged to contact us for these educational tools. Write to us at the address provided at the back.

SEEDS is a non profit organization working to make resilient communities. For this, SEEDS adopt a multi hazards locally based approach seeking to empower communities through awareness generation, training and action.

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