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THE HINDU

Kurukshetra
A JOURNAL ON RURAL DEVELOPMENT

Science Reporter

YOJANA

Press Information Bureau

News from
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What made
Gandhi
Gandhi.

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⇒ **DEMANDING TRANSPARENCY IN POLITICAL FINANCE**

Throughout the world, political parties collect funds to build and sustain the organisation, to train party cadres and fight elections. Recognising that they are the main link to the citizens (as voters) and, by implication, the mainstay of democracy, many countries, including India, have helped cushion their expenses at public cost. But the major share of funding still comes from voluntary contribution. Undeniably the sources of such funding influence voting behaviour and that is why the subject impacts directly on democratic rights. Surprisingly when all important institutions of governance, including Parliament, the judiciary and certainly the executive, have attracted intense public attention, the financing of political parties has been left relatively untouched. Until recently.

CIC order

In 2011, two resolute RTI querists — the Association for Democratic Rights, an NGO, and an individual, Subhash Aggarwal — appealed to the Central Information Commission since political parties had refused to share information although by all accounts they were public bodies. The appeals were upheld in an order dated June 3, issued by the full bench of CIC, which ruled that six national political parties needed to provide information as sought by establishing the RTI apparatus as required. The logic: they were recipients of valuable state resources in the form of land, accommodation, and tax exemptions which amounted to "substantial funding" by the public exchequer. Accordingly, they were to be treated as public bodies and made answerable as such.

The day the order was announced, everyone knew that most political parties would come together to annul the damage done by the CIC. They would either seek judicial intervention or introduce fresh legislation to overturn the CIC's order. Knowing this, the applicants forthwith filed a caveat to forestall the grant of a stay against the order. All newspapers have since reported that a bill has even been kept in readiness to be introduced in the forthcoming session of Parliament seeking to exclude political parties from the ambit of RTI.

The major points of discord are: first, unfurling the RTI umbrella over political parties has implications for political strategy and functioning as once conceded, even information on the distribution or denial of ticket can be sought — clearly a situation that is untenable given the competitiveness, secrecy and intricacy of political decision-making. Second, political parties do not maintain the documentation needed to respond to wide-ranging RTI queries and they cannot be expected to establish a new organisation only to fulfil the sweeping questions that will come under the RTI. Third, if the argument that political parties received "substantial funding" is applied equitably, it would apply to all similarly placed NGOs. The ensuing demands for information from all such bodies would explode the scope of CIC's functions

and belie the prime objective of the RTI which was to provide information on government functioning. Fourth, when it is well known and publicly admitted that most political funding comes from black money sources and in cash, it is impossible to declare whose contribution it was without first cleaning up the "number two" monopoly.

In their place the arguments are not without validity. But none of them addresses the fundamental need to regulate political finance — something that progressive countries enforced decades ago. According to the International Institute for Democracy and Electoral Assistance (IDEA) Handbook 2003 and its current website, in nearly 60 countries, which include the United States, the United Kingdom, Japan, Canada, France, Germany and Thailand, political parties are bound to disclose all contributions beyond a specified threshold. India is not among them. Alongside there exists a ban on making anonymous donations to political parties in more than 45 countries which include all the above countries. Again India is not among them. Happily, India does have a provision for public disclosure of expenditure by political candidates but even so, there is no ceiling on party election expenditure — only candidates' expenses. That leaves enormous scope for gargantuan indirect spending on elections so blithely admitted to by Gopinath Munde who now faces the wrath of the Election Commission for publicly pitching a figure of Rs 8 crore spent on his own election against the stipulated limit of Rs 25 lakh.

Our political parties appear to see the whole business of being pulled under the RTI as brinkmanship. They rest sanguine in the knowledge that civil society in general and RTI activists in particular can do little harm as the latter's sphere of influence is essentially urban, middle-class and, for that very reason, circumscribed. Ultimately with no bridges to the people and little influence, they are secure in the knowledge that civil society would have no option but to pursue the public interest litigation route. That alternative despite some resounding successes is exasperatingly slow.

An Opportunity

Every right-minded political party should look on the CIC verdict as an opportunity — not a threat. In fact, were even two national parties to voluntarily adopt a common reporting system it would remove clouds of opacity, greatly enhance public faith and demonstrate a concern for ethical standards. Others would perforce have to follow suit. Indeed this is a priceless moment for the political system to collectively break itself loose from criminal elements, unaccounted and excessive money power and to remove illegitimacy from the power game.

Political parties should pledge to support a law to ban anonymous donations and cash contributions beyond a threshold and put a ceiling on election related expenses of individual political parties. The Election Commission or a new statutory body should have full authority to oversee the inflow and outflow of political finance and institute legal action if scrutiny is stone-walled. As a public body, it should *suo motu* give information collected by it on its website and also arrange for regular media briefings based on the declarations made by political parties. But it should have no compunction in resorting to the use of Section 8 of RTI if the information sought by querists goes beyond the subject of political finance — so relieving political parties from the rigmarole of RTI and free to steer their internal political strategies in secrecy.

But first voters need the reassurance that political parties are concerned enough to unite to clean the mess. The present opportunity and its timing can be used to augur the much-needed change. If it is merely used to remove the irritant called RTI, it will show that self-preservation is more important to political parties than bringing transparency into their financial dealings. When half the countries in the world have a strict code

and laws on political finance, insist on full public disclosure and impose ceilings on party election expenditure, should the Indian voter be forced to accept any less? When the model code of conduct for elections could be evolved so successfully simply through consensus, why not a model code for political finance?

⇒ **The Underpowered Asian**

India's founding fathers had a clear idea where it was to stand in the comity of nations. They were quite sure that India's place was in Asia. There was nothing parochial to this vision. It sprang from a certain understanding of world history and Asian culture. As they saw it, at the end of Second World War, almost all of Asia had been at the heel of the Europeans for close to two centuries. While acutely aware of this, they saw the sloughing-off of the colonial yoke as the mere beginning of a meaningful journey. The continent's nation-builders set themselves the far more ambitious task of building an Asia so prosperous that it could provide a balance to western hegemony.

Seoul, an Urban Marvel

On a busman's holiday to the East of us, an Indian economist sees that in the rest of Asia much of this grand vision has been realised. For instance, Seoul in its north-eastern extremity is an urban marvel. Its network of expressways, efficient public transport, pedestrian-friendly streets and glorious public services leave you in a state of shock and awe. To the naked eye there is no poverty visible on its streets, nor any great inequality. Instead, food stalls abound and everybody is gorging on their stuff while clutching at their Gucci bags when it is not their Samsung Android phone.

Having once been the champion of the Asian voice in the United Nations, India now languishes as its poor cousin. Its GDP per capita is pitifully low compared to that of the Asian powerhouses, the price of food too high in relation to capita income and the fruits of its much-vaunted high growth in recent years are poorly distributed. From having convened the Asian Relations Conference even before gaining independence to later inspiring Bandung, India has lost its leadership role mainly because it has been left behind in the race to develop the economy. The rest of Asia may admire India as the original home of some profound philosophies, but it is unlikely to capture their imagination as an economy.

This has less to do with the size and growth of India's economy but to do with the fact that India is clearly out of line with one central aspect of the Asian development model which is the wide-spreading of the fruits of growth. India has by now overtaken Japan as the world's third largest economy in purchasing-power-parity terms but the backlog of poverty in India is overwhelming even when the bar is set low. China does have high inequality but has far lower poverty levels than India. In any case, restricting ourselves to the income criterion misses an important element when it comes to evaluating the standard of living. Beyond higher per capita incomes, the economies of the east have a vast stock of well functioning public infrastructure. We refuse to acknowledge how important this is in enabling people to lead a dignified life.

Elusive

Recognising the importance of physical infrastructure would alert us to what must constitute the core of the public discourse on the future of India. The political class speaks of "inclusion" and "empowerment" but does not walk this talk. It has confined itself to promulgating rights. These count for less than an abundant physical infrastructure in empowering the poor. The Right to Information Act may reveal important details of a road project, especially regarding finance, but it can do little to ensure that the road is built well, leave alone well-maintained. Their significance is close to that of the Fundamental Rights enshrined in the Constitution. While they are not without value,

their role in economic empowerment is remote. On the other hand, the Directive Principles call upon the state to act as a facilitator but they are not justiciable. The current trend in Indian politics is for the political class to legislate more and more while withdrawing from building the public good that is physical infrastructure. It is important to understand why it persists with this strategy.

⇒ A Mountain
Strike Corps is not the Only Option

In the history of Indian strategic thought, the decision to create a mountain strike corps against China will remain a landmark. While the file on the subject has apparently been circulating for a while, the absence of open discussion on so momentous a decision is deeply disappointing. Some commentators are of the view that the Chinese incursion in the Depsang plains swung the decision decisively in favour of the strike corps. If so, it doesn't make much sense, for, where is Depsang and where is Panagarh — the headquarters of the mountain strike corps?

What irks a strategic commentator about this decision is the question whether our reaction is wiser, more mature and better institutionalised than it was in 1962. At that time, the Prime Minister had "instructed" the army to "throw out" the Chinese following which Brigadier Dalvi's mountain brigade made its fateful advance across Namka Chu. The big question today is — what were our options? Did we examine more than one option and select the best one? Presumably, it is to guarantee that we go through an intellectual process that we now have a Chiefs of Staff Committee, an Integrated Staff, a National Security Council and Adviser, and the Cabinet Committee on Security (CCS). Did they actually look at alternatives, or was it a straightforward case of 'yes' or 'no' for a mountain strike corps?

The First Step

The first thought that strikes a strategic thinker is whether any non-military options were first examined. This is an inevitable first step in the long and tortuous process that leads up to military action. The Depsang incident, it will be remembered, took place in a part of the country which, before 1954, was always shown as un-demarcated or undefined. What, for instance, were the arguments in the CCS for and against the Johnson-Ardagh Line and the Macartney line? Those who are unfamiliar with these names can take a look at Wikipedia. It is the essence to understanding a possible settlement of the boundary dispute. The fact is that while our case in Arunachal Pradesh is strong and undisputed, the situation is not quite similar in the west where the recent intrusion took place. Admittedly, the political numbers simply don't permit the government to commit itself to a grand bargain with China on territory. The Chinese are in a similar position. But if the border problem hinges for a solution on a strong, domestic government, it is indeed better for both countries to postpone the solution to the next generation — as the Chinese suggest. So how did we come to the conclusion that the Chinese may force the border issue *now*, leading us to raise a mountain strike corps?

It has been argued that China is a continental power with a huge land army. It is making amends by funding its Navy strongly, to change the balance. But its army reforms have converted its land forces into a large armoured and air mobile force capable of rapid redeployment.

Under these conditions, to raise an infantry heavy mountain strike corps has obvious disadvantages. First, it would be geographically confined to one or two axes of movement and capable of being blunted. Secondly, whatever we may do on land, we will remain an asymmetric power *vis-à-vis* the huge People's Liberation Army (PLA), whose defence budget is thrice ours. Thirdly, a strike corps in the mountains denies us the time and place of a counter offensive, because it is geographically limited. These arguments

should have come up during the process of examining options. If they didn't, it is tragic and shows little improvement from the confusion and bluster of 1962 preceding the disaster.

Infantry Heavy

The Indian Army is a fine institution and no one grudges it any funding. But it is also one of the most infantry heavy armies in the world. Its armour-to-infantry ratio is badly skewed, it is not air mobile, its manoeuvre capability is poor and Rs.60,000 crore would have addressed all these deficiencies and more. Instead, with the strike corps it will become even more infantry heavy and Rs.60,000 crore will have been wasted in barely addressing the tremendous disparity with the PLA's mobility, numbers and manoeuvre capability. It must be remembered that we are addressing mountain warfare, where high altitude acclimatisation is a necessity for soldiers before being deployed. So the mountain strike corps would already be at high altitudes with little possibility of being redeployed without huge air mobility. All this should have been apparent to the Army Aviation Corps whose leaders seem bereft of strategic thinking, having flown light helicopters all their lives. Stopping the advancing Chinese in the mountains strung out through the valleys should have required specialised ground support aircraft like the A-10 Warthog, another strategic choice which was probably ignored by the army aviation branch. By not examining non-army options we seem to be repeating the mistakes of 1962 when the Sino-Indian war became a purely army-to-army affair for reasons that have still not been established.

Strengths & Weaknesses

We are not privy to the notings in the file preceding the decision to raise a mountain strike corps, but it would certainly appear that the border issue appears to have been treated purely as an army problem for which only the army can find a solution, with the other arms of the government contributing nothing. Most of all, we appear not to have assessed the Chinese weakness and strengths. Their strength is the huge logistic network that they have built up in Tibet. By creating a one axis strike corps, we have played into their strengths. The Chinese weakness lies in the Indian Ocean, a fact that even Beijing will readily concede. The clash between their political system and economic prosperity requires resources and, increasingly, the Chinese resource pool is Africa, which generates massive sea lines of communication (SLOC) through the Indian Ocean. Today, they are merely SLOCs; tomorrow they will be the Chinese Jugular. Beijing's paranoia about the Indian Ocean is therefore understandable but the threat according to its strategic commentators comes only from the U.S. Sixty thousand crore spent on strengthening the Indian Navy's SLOC interdiction capability would have given us a stranglehold on the Chinese routes through the Indian Ocean. The Himalayan border, the entire border, could have been held hostage by our strength in the Indian Ocean with an investment of Rs.60,000 crore.

No one minimises the pinpricks that the Chinese are capable of but what we are looking for is an asymmetric capability to balance the Chinese four-fold advantage in GDP over India. Finding the solution requires all arms of the government to debate where our scarce resources should go. A geographically limited one axis offensive will not destabilise the PLA, but a flotilla of nuclear submarines and a three carrier air group in the Indian Ocean can economically cripple mainland China.

⇒ A Climate Plan that Changes Nothing

United States President Barack Obama laid out his administration's first blueprint on the domestic and international initiatives it will pursue to tackle climate change. As with most speeches of the Obama presidency, this too was based on the catchy rhetoric of humanism, but driven by the narrative of instrumentalism. This style-over-substance approach to climate change, intended primarily for a U.S.-based audience —

and by initial reaction, well-received across the board — would have been palatable had it not been for the troubling implications it holds for both multilateral climate change negotiations and the economic policies of developing countries, India in particular. Mr. Obama's speech effectively allows developed countries to abandon their end of the equity bargain — i.e. to provide technology transfer and financial support to developing and Least Developed Countries (LDCs) — in return for their promise of sustainable growth. The discourse has now turned to market-oriented approaches to foreign investment and de-regulation that emerging economies must welcome to "green" their development, if they want to be seen as responsible stakeholders.

Energy

The renewable energy sector in India alone is worth billions of dollars, if the forecasts of global consulting firms are to be believed. High financing costs, stringent government regulations and widespread public scepticism on the efficacy of solar and wind power have stunted the growth of the Indian domestic sector. For American 'green companies' armed with subsidies and tax breaks, dominating this market will be a walk in the park. All they need to do is to hope that the Indian government continues its foot-dragging renewable energy policy — one that currently permits 100 per cent FDI with little regulatory guidance — while pressing for tougher intellectual property laws bilaterally, in line with the 'TRIPS-plus' vision. New Delhi has thus far held out on restrictive IP laws, but faced with the threat of harsher immigration rules and limits on Indian exports, concessions on this front may be a matter of time. Moreover, the U.S. has a powerful carrot in the form of shale gas exports, which India has eyed keenly.

Death knell for Equity

Above all, U.S. attempts to tackle climate change on a bilateral basis sounds the death knell for the principle of equity in international climate talks. In the run-up to the Paris conference in 2015, most developing countries have made it amply clear that any multilateral agreement must address the issue of technology transfer and funding. The U.S., opposed to such preferential treatment, has fired the first shot with President Obama calling for an "inclusive" climate deal. His administration has cleverly shifted the goalposts of technology transfer, from its original, unconditional premise to one based on "innovation" and "investment" in clean energy, which invariably skews the market in favour of western companies. This has now been packaged as part of a larger initiative by the Obama administration to warn India and others about the dangers of climate change. With powerful tools of negotiation at its disposal, the Obama administration would much rather talk to major emitters individually than confront the combined might of the BASIC (Brazil, South Africa, India and China) group. The U.S. can thus secure its end of the 2015 climate deal with regard to flexible emission cuts, while shedding its reputation of a 'climate-rebel' insensitive to the concerns of developing countries — the diplomatic equivalent of having its cake and eating it too.

From New Delhi's perspective, President Obama's new approach should be conclusive proof that India and the United States are on different pages with regard to climate change. Not only has the U.S. talked past the demands of developing countries on equitable measures, it is also willing to harvest the issue's moral significance for its narrow economic interests. For advocates of a values-based "natural" alliance between both countries, few examples stand out so starkly as to how interests trump principles.

⇒ THE EMERGING DEBT TRAP

India's external debt was a little just over $100 billion in 2004; by March 2013, this had grown to $390 billion. More worryingly, the short term debt payable within a year, an indicator of immediate vulnerability, has ballooned to $172

billion in 2013, from $54 billion in 2008. Consequently, India has to pay back $172 billion to foreign lenders by March 2014. This is nearly 60 per cent of its current foreign exchange reserves. In normal circumstances, this commitment would not appear so daunting but then circumstances are anything but normal. First, the reason India has accumulated such a huge short term debt stock is that cheap money at virtually zero interest rate was supplied in abundance by western central banks, especially the U.S. Federal Reserve, post 2008. Of course, the developed world followed an easy liquidity policy to save their own economies, threatened by the worst recession since the Great Depression. But many emerging market economies ended up walking into what can only be described as a "cheap money trap."

But such cheap money has made many emerging economies complacent about receiving inward capital flows without creating the necessary policy framework to strengthen the sinews of their domestic industry. In the four years after 2008, India's own experience has been one of losing its export competitiveness relative to other developing countries. This has decelerated our export earnings. Added to this is our mounting import bill, largely led by rising oil prices. The massive increase in gold imports further added to our woes. The double whammy of decelerating exports and rising imports has resulted in India becoming one of the highest current account deficit nations, at nearly 5 per cent of GDP annually. India needs at least $90 billion of fresh capital inflows a year to meet its current account deficit. It could become particularly vulnerable if the U.S. Federal Reserve decides to partially roll back its cheap money policy in the months ahead. Cheap global money, which had enabled Indian corporates and financial institutions to accumulate more and more debt, will certainly not continue for long. India must begin to prepare for such a contingency. The only way out of this predicament is for the Manmohan Singh government to build a consensus among political parties to rebuild the economy on a war footing. But with general elections less than a year away, the UPA lacks the political capital to make such a determined effort to arrest the current economic slide.

⇒ LEARNING TO LIVE IN A NEW ASIA

Three high-level meetings in the past month, between the Prime Ministers of India and China, of Japan and India, and the summit between the Presidents of the U.S. and China have placed an intensified focus on the new dynamics of Asian politics.

Before the previous century ended, many scholars rushed to predict that the 21st century would be "Asia's century." This view emerged partly from the theory of Asia's turn, considering that the 19th was the "British century" and the 20th was the "American century." In part, it was in recognition of the rise of China, India and other Asian powers. A decade into the present century, however, enthusiasm for Asia stands diminished as realities of global politics assert themselves. During my recent travels to Japan, China, Russia and three Association of Southeast Asian Nations (ASEAN) countries.

India is a central player on the Asian stage. "Asia" of strategic literature may not really begin at the Suez Canal, stretching up to the Sea of Japan, even though many Indian experts prefer to define Asian space as "the Indo-Pacific Region." But, unlike in the past, even the narrower definition now unanimously includes India. To Asian governments and strategic communities, "Asia" means "Asia-Pacific" and its composition is seen as identical to the membership of the East Asia Summit (EAS), namely 10 members of ASEAN, six "dialogue partners" and two "Pacific" powers, *viz* the U.S. and Russia. How their internal dynamics work today came through, with remarkable lucidity, at the "Asia-Pacific Roundtable," the major Track II conference held in Kuala Lumpur in early June.

China-U.S. Relations

China, the drama's chief protagonist, is undoubtedly the single most important factor which has drawn world attention to the region, justifying the perception that power has been shifting from the west to the east. Until recently, the country was on its "charm offensive" engaged in developing cooperation with neighbours and sharing the fruits of its growing wealth with them. But with expanding treasures came the ability and will to spend huge sums on military hardware and technology, a desire to push old territorial and maritime claims, and consequent flashes of aggressive behaviour. This was a novel development which ASEAN, the main grouping of the region's states — big and small, sought to address through "the ASEAN way," i.e. through consultations and consensus, but it failed. Among many reasons for it, two important ones related to fundamental tensions between China and Japan and the complex situation in the Korean peninsula where North Korea, an erstwhile puppet of China, continues to defy everyone and head towards developing a nuclear arsenal of its own. Apart from the robust U.S. response, these reasons may partially explain China's insecurity, reflected in greater aggressiveness.

The U.S., the country which enjoyed unchallenged supremacy, looks at China somewhat warily. It worries about devising the best strategy on how to grapple with China's rising power at a time when economic interdependence between the U.S. and China has assumed unprecedented proportions. Responding to requests from ASEAN and the others, the U.S., under Obama 1.0, sought to stage "the pivot" towards Asia by ensuring to enhance its military footprint in the region. When Beijing complained that the U.S. was reverting to the Cold War era policy of "containing" China, the projection from Washington changed. The preferred vehicle now was a "re-balancing" of U.S. strategic responsibilities in the Indian and Pacific Oceans, although little substantial difference was detected between the two postures. At the Kuala Lumpur conference, Ambassador Christopher Hill, a top former U.S. official, asserted that there would be a further policy "re-calibration." While hedging its bets, the U.S. has no option but to devise cooperative arrangements and avoid conflict in Asia. The U.S. and China are unlikely to advance towards "cold war" or "hot war." Their future relationship may be stamped by a blend of "cooperation, competition, rivalry and periodic tensions."

Tier II Powers

It may hurt our pride but a realistic assessment shows that India, along with Japan, is a Tier II power, not exactly in the same upper category as China and the U.S. A frank recognition of the fact should help us to craft and pursue a dependable policy to handle Asia's complexities. New Delhi gave a clear glimpse of how it intended to address the task as it hosted Chinese Premier Li Keqiang on his first visit to India prior to Dr. Singh's visit to Japan.

India wants cooperation, not conflict, with China. It aims at a relationship based on genuine mutual trust, respect and benefit. In essence, it seeks an equal partnership; it would optimally resist domination of the region by China. These motivations, combined with Tokyo's own tortured relationship with Beijing, provide a strong foundation for the Strategic and Global Partnership between India and Japan that the two Prime Ministers proclaimed recently. Economic interests bring them closer together, reinforced by the strategic need to establish a viable balance of power in the region. They look to other democratic countries — Australia, South Korea, ASEAN — for their contribution to ensure that forces favouring cooperation prevail over those elements that could drag the region towards conflict. The proposed "alliance for democracy," Japanese Prime Minister Shinzo Abe's favourite idea, cannot, however, work if it is structured in patently anti-China terms. This

explains why India strives for creating a better balance of power, but stays in the forefront advocating an inclusive regional architecture. We need to strengthen East Asia Summit as the regional mechanism to resolve inter-state differences through negotiations. Proposals for a new friendship treaty, advanced by Indonesia and Russia recently, deserve favourable consideration in this context.

Understanding China

Madam Fu Ying, a leading political figure in China today, was vocal, at the Kuala Lumpur conference, in defining "the Chinese dream." She explained that China's new leadership simply wanted a better life for every Chinese citizen, stressing that "the Chinese dream" was part of "the larger Asian dream." She revealed how her political colleagues often wondered why the world could not understand China's friendly approach and why China's neighbourhood is "so unquiet." I asked her whether it occurred to Beijing's political elite that tensions in the neighbourhood might have something to do with China's policy and actions too. Her response was that she "had not heard anything about it." But our exchange confirmed the chasm between China's words and actions. If the chasm narrows, trust may enhance, but if it widens, trust will be a further casualty.

Way Shead

In short, the chances of an "Asian century" materialising are mixed at present. They may improve only if Asia's leading powers begin to do what they are saying and say frankly what they are doing. They also need to reread Europe's history. To reconcile conflicting national interests, war is not the only option. Sustained dialogue, backed by strong political will, can work. The EAS conference room is where Asian leaders should be spending more time rather than plotting to send soldiers to remote Ladakh, naval ships to the South China Sea and fishing vessels to the East China Sea.

⇒ **A Path to Environmental Burnout**

Those thirsty for good news on the environmental front may have found some relief in Prime Minister Manmohan Singh's pledge to double India's renewable energy capacity by 2017. Fair enough. Renewable energy sources have a key role to play in the transition towards a sustainable and low-carbon economy worldwide. However, within the renewable energy debate there are several shades of green. Some technologies that are being pitched in the guise of renewable energy have the potential to cause even more harm than fossil fuel-based energy sources.

One such non-solution is Waste-to-energy (WtE) incineration and its subspecies: gasification, pyrolysis and plasma arc. These technologies are now being touted as "The Answer" to the twin problems of municipal waste (particularly in disproportionately expanding Indian cities) and climate change. But what does that mean for our environment, the economy and sustainable growth?

Toxic

First, the green energy status enjoyed by the WtE incinerator industry is not only misplaced, but dangerous. It reflects a woefully inaccurate interpretation of what waste incineration actually is and what the impacts are on public health. Waste incinerators are a major source of toxic emissions that include volatile organic gases and heavy metals. They are also among the top five sources of dioxin emissions worldwide. The World Health Organization (WHO) acknowledges dioxins as one of the "dirty dozen" — a group of dangerous chemicals known as persistent organic pollutants (POPs), where even in low does have the potential to cause cancers.

Independent air samples taken by the Central Pollution Control Board and the Chennai-based non-profit Global Alliance for Incinerator Alternatives (GAIA) in and around India's celebrated incinerator in Okhla, New Delhi, have revealed life threatening levels of particulates and

toxic chemicals including dioxins, which was 30-40 times above permissible limits. Moreover, epidemiological investigations in places where residents have been living close to incinerator facilities since 2009 have provided further evidence linking incidences of cancer and low birth weight to incinerator emissions.

Low generation

Second, power generation though mixed waste incineration has so far been a distant and rather unachievable dream given the nature of our waste. The Ministry of New and Renewable Energy's (MNRE) flagship programme on "energy recovery from urban and industrial waste" stands testament to this fact. When announced in May 2011, it aimed to generate nearly 84MW of power from waste by providing subsidies up to Rs.10 crore to developers. But as of today, only one of the seven proposed projects has managed to take off, and without contributing a single unit of power to the grid. This is primarily due to the failure of these technologies to process unsegregated waste.

Not climate friendly

Third, WtE incineration has been labelled as renewable and sustainable, but the technology is far from climate friendly. It is actually quite ironic that WtE incinerators are subsidised as a climate change mitigation strategy when they rely on burning high calorific recyclable materials such as paper and plastic. The United States Environmental Protection Agency (USEPA), the foremost environmental agency in the U.S., recognises that incinerators emit 2.5 times more carbon dioxide per MW than coal fired power plants.

Expensive

Fourth, when it comes to generating energy, incinerators are very expensive and inefficient. Their financial viability relies heavily on various fiscal and financial incentives from government such as capital subsidies, concessional customs duties on the import of machinery and components, excise duty exemptions, relief of taxes, etc.

According to the U.S. Energy Information Administration's Annual Energy Outlook 2010, the projected capital cost of new waste incinerator facilities is $8,232 per kilowatt hour. It is twice the cost of coal-fired power and 60 per cent more than advanced nuclear energy. Despite this, the government is still determined to pursue WtE as a solution and has decided to divert huge amounts of public money to subsidise the WtE industry.

In the Twelfth Five Year Plan (2012-2017), what the MNRE envisages includes substantial investments in WtE. Just a fraction of this money would be needed to set up systems that can efficiently recover valuable resources from waste, recycle them and create millions of jobs. Cities like Pune and Bangalore are already charting the way on such an approach.

Undermines other options

America's largest WtE company, Covanta, recently announced its plan to conclude operations in the United Kingdom, after local residents strongly protested against their proposals. This announcement came around the same time that the Municipal Corporation of Hyderabad announced its plans to construct India's largest incinerator using Covanta technology. Clearly, the industry is hoping for a new lease on life through projects in China and India, where environmental regulations are lax and the populace is less aware of the negative impacts of waste incineration.

The costs that WtE incinerators impose on public health, local economies, and resource consumption can hardly be justified. Ultimately, WtE incinerators undermine the truly sustainable waste management options such as prevention, reuse, and recycling that correspond much better to the needs of India. This is at a time when Europe has committed to ending the landfilling

and incineration of recyclable waste by 2020, aiming instead to implement a resource-efficiency strategy that will boost a circular economy — where, all waste is treated as a resource rather than requiring expensive infrastructure to dispose of it. The Indian government should be careful not to be fooled into making long-term commitments to old-fashioned and costly, false solutions proposed by an industry desperately trying to get a foothold in the country.

⇒ Wanted, an Indian Frankfurter

'The government proposes to come up with a Bill for the appointment of judges to the higher judiciary replacing the current collegium system. The judiciary evolved the collegium system in the 1990s replacing the previous system where the executive had a predominant voice in the appointment of judges. Under the collegium system, the judiciary has complete control over the appointment of judges. The political executive is of the view that the collegium system hasn't worked well; hence a Judicial Appointment Commission, in which the executive will have a say in the appointment of judges, is necessary to achieve the objective of appointing the best people as judges in a transparent fashion. Arguably, the government's intervention in the appointment of judges strikes at the root of independence of judiciary.'

While "who" should appoint judges can be debated endlessly, the need is to broaden the debate on the appointment of judges by focusing on other relevant issues like having jurists as judges of the Supreme Court. There has never been much debate on this issue.

Three categories

Article 124 (3) of the Constitution, broadly, provides for three categories of persons who are "eligible" to be appointed to the Supreme Court — a High Court judge with five years experience; an advocate in the High Court with 10 years experience; a "distinguished jurist." The first two self-explanatory categories, though different,

have a high degree of commonality. It comprises people who work in courts and are involved in litigation either as judges or as lawyers. However, the third category is not defined in the Constitution. Nonetheless, one can safely conclude that a "distinguished jurist" means a category of individuals different from judges and practising lawyers because these two categories find separate mention. A "distinguished jurist" refers to academic lawyers or law professors: people who have challenged and expanded the existing frontiers of legal knowledge through cutting edge research and teaching.

The "distinguished jurist" category was added to the list of "eligible" candidates for appointment to the Supreme Court in the draft Constitution. This was done in order to have diversity in professional backgrounds among individuals sitting on the bench of the Apex Court. The late H.V. Kamath, member of the Constituent Assembly, while proposing the "distinguished jurist" category, said, on May 24, 1949: "The object of this little amendment of mine is to open a wider field of choice for the President in the matter of appointment of judges of the Supreme Court... I am sure that the House will realize that it is desirable, may [be] it is essential, to have men — or for the matter of that, women — who are possessed of outstanding legal and juristic learning. In my humble judgment, such are not necessarily confined to Judges or Advocates. Incidentally, I may mention that this amendment of mine is based on the provision relating to the qualifications for Judges of the International Court of Justice at The Hague." Kamath's amendment was adopted by the Constituent Assembly.

Will raise the bar

It is important to understand the significance of having law professors on the bench of India's apex court. The Supreme Court is a court of appellate jurisdiction that has to decide on substantial questions of law. It also acts as a court of original jurisdiction in certain cases.

Further, the law declared by the Supreme Court is the law of the land. Consequently, the Supreme Court is constitutionally bound to develop new legal principles and jurisprudence by interpreting the Constitution and other statutes.

This requires a certain ability to theorise and conceptualise. Law professors are academically trained to theorise and conceptualise. Industrious law professors improve upon this training, through years of painstaking research and teaching in their specialised domains, often employing empirical and interdisciplinary tools. These well developed and nuanced theorising and conceptualising abilities have the potential of raising the bar of legal reasoning up by several notches.

Regrettably, 63 long years after the Constitution was adopted, both the judiciary and the executive have consistently ignored this clear constitutional mandate. In the history of the Indian Republic, never ever has a "distinguished jurist," i.e. a law professor, been appointed as a judge of the Supreme Court, although India has produced some outstanding law professors worthy of the "distinguished jurist" tag. In last 63 years, all appointments to the Court have been made from the first "eligible" category i.e. High Court judges, barring four instances, where practising lawyers (the second category) were directly appointed as Supreme Court judges.

The U.S. leads

Compare this with the U.S. Supreme Court where many law professors have been appointed as judges. Comparison with the U.S. is in order because the Constituent Assembly debates referred to the American example where President Roosevelt appointed Felix Frankfurter, a Professor at Harvard Law School for 25 years, as an Associate Judge of the American Supreme Court in 1939. Justice Frankfurter went on to become one of the most celebrated judges of the American Supreme Court and a noted advocate of "judicial restraint" — something, which our constitutional polity desperately needs. Even among the current judges of the American Supreme Court, Justice A.M. Kennedy, before being nominated to the Supreme Court by President Reagan in 1988, was a Professor of Constitutional law for 23 years. Similarly, Justice R.B. Ginsburg, another current Associate Judge of the U.S. Supreme Court, taught for 17 years including at the Columbia Law School before becoming a judge.

Notwithstanding who appoints judges to the higher judiciary, the debate should also be, *inter alia* , on expanding the catchment area to all the three categories given in Article 124 (3). This expansion in the catchment area will throw up an Indian Frankfurter, which our Republic so rightly deserves and which, as [legal scholar] Upendra Baxi puts it, "has been wilfully squandered."

⇒ **The Signs are Ominous**

The Indira Gandhi National Open University (IGNOU) cannot hold the prospects of the country's hearing impaired ransom to the whims of a single individual head of institution. In a patently regressive move, the premier university has recently decided to shut down the Indian Sign Language Research and Training Centre (ISLRTC) from the current academic year. This, despite the growing emphasis on signing as a language to bridge the communication barrier between the deaf and the hearing. Ironically though, it was IGNOU that took the pioneering initiative to start a Bachelor of Arts degree in sign language in 2009, in collaboration with the University of Central Lancashire in the United Kingdom. It was this programme that prompted the Union Human Resource Development (HRD) and Social Justice and Empowerment (SJE) ministries to involve IGNOU in the establishment of the ISLRTC on its campus in 2011. This was the very Centre for which a huge headline-grabbing outlay was announced in the 2010 Union budget. Beyond the fanfare, the Finance Minister's statement raised hopes that

the government was at last acting on a promise, contained in the 11th Plan document, to set up a nodal centre to standardise Indian sign language and train a large number of people in it. But suddenly, the larger objective of bringing the hearing impaired into the national mainstream seems in danger of being ignored. The factors that appear to have influenced the current deplorable move are not particularly clear. But the Vice Chancellor's reasoning that a dual degree course was not conceived under the IGNOU Act does not stand up to scrutiny considering that the conception of new programmes and alterations to existing ones are well within the powers of the academic Council. Nor is it the case that open and distance education preclude teaching and learning face-to-face.

Collegium System in Judiciary

The Emergency and the post-Emergency era witnessed attempts by the executive to muzzle the judiciary. It was to check this erosion of independence of the judiciary that the 'Collegium' system was evolved, by which the senior-most judges of the High Court and the Supreme Court selected judges with the executive merely being consulted. But 20 years after the Collegium experiment, the appointment of judges "by the judges" is being perceived as appointments "for the judges." There is growing evidence that the current system of judicial appointments has resulted in incompetent, inefficient, ethically compromised individuals being appointed as judges.

In May 2013, over 1,000 lawyers of the Punjab and Haryana High Court protesting the recommendation of seven names by the High Court Collegium for appointment as judges wrote: "The independence and integrity of the judiciary has been put at stake by the Collegium while recommending the names of advocates for elevation as judges ... the decisions of the Collegium seem to have been based on considerations other than merit and integrity of the candidate". They added, "it has now become a matter of practice and convenience to recommend advocates who are the sons, daughters, relatives and juniors of former judges and Chief Justices. Nepotism and favouritism is writ large. We all need to rise to the occasion and oppose such recommendation."

In June 2013, the Madras High Court Advocates Association (MHAA) gave a representation to the Chief Justice of the High Court regarding a list of 15 names forwarded by the Collegium, pointing out, "the proposed list of persons recommended for elevation to the high constitutional office falls far short of the standards set out in the various judgments of the Supreme Court. It appears that the names have been proposed on extraneous criteria such as caste, religion, office affiliations, political considerations and even personal interests and *quid pro quo* . We at the Bar are deeply distressed, concerned and even alarmed at the partisan manner in which the selection is made. It exhibits a total indifference to the future of the Judiciary as an institution where institutional interests have been sacrificed at the altar of personal pursuits."

The U.K. system made assessment in respect of all criteria evidence-based. Selection will be rejected if there is not enough evidence that the person is suitable for the office concerned, or there is evidence that the person is not the best candidate on merit.

The 'public' senate hearings for appointments of judges to superior courts in the U.S. are another example of transparency. We may not find the U.S. system implementable as it is; but nothing prevents us from incorporating the key principles of transparency, accountability and citizen participation underlying the U.S. system for selection of judges.

Transparency will inspire confidence in people. Appointment of judges being in the public domain should be open and visible. Considering the views of the Bar is a healthy process of consultation as it is privy to a lot more

information than the general public.

Criticism of biased, partisan and compromised judicial appointments is not new. Yet for the last 20 years, successive Supreme Court Collegiums steadfastly refused to "clean the stables" and evolve a transparent, open and accountable procedure to ensure that the best persons were appointed as judges to the High Courts and the Supreme Court. Judges to these constitutional courts bear the great responsibility of ensuring respect for the "rule of law" and ensuring that governance is based on constitutional principles and vision.

The country deserves nothing short of the most competent, learned persons as judges whose ethical conduct is beyond doubt. Irrespective of whether appointments are Collegium based or through a new Judicial Commission, members of the Bar as also citizens need to participate in the selection process. Our nation's future cannot be totally compromised because the powerful want to ensure their power in perpetuity.

The winds of change sweeping the world demanding greater participation, inclusion, equity, accountability and transparency will eventually engulf the judiciary too. We hope the wise persons in the judicial system will read the signs.

⇒ Saga of River Nile

The broad shouldered hills echoed a low rumble as explosives tore through the grooved walls of a canyon carved by the torrential flow of the most important tributary of Africa's greatest river. Men in hard hats scurried across the vast construction site of the Grand Ethiopian Renaissance dam that, once complete, will harness the Blue Nile to crank out 6,000 MW of electricity for this energy-starved nation.

The Blue Nile escapes Lake Tana in the Ethiopian highlands, tumbling thousands of metres westwards through narrow gorges, carrying 86 per cent of the Nile's eventual flow. At Khartoum, in Sudan, the river joins the White Nile and heads north through the Egyptian desert and drains into the Mediterranean Sea through the Nile Delta that nourishes 60 per cent of Egypt's estimated 85 million people.

Last month, the construction crew in Ethiopia diverted the course of the river to lay the foundation of the dam, triggering protests in Egypt and unnerving Mohamed Morsy's embattled government. Once complete, the Renaissance dam shall stand 145 m tall at the head of a 74 billion cubic metre (bcm) reservoir, a volume greater than the Blue Nile's annual flow.

For Power Generation

At an all-party meeting in Cairo, Egyptian parliamentarians fussed over Ethiopian control of the Nile and threatened to go to war to safeguard Cairo's interests. "The lives of the Egyptians are connected around it [the Nile]," said Mr. Morsy [since removed by the Egyptian Army] in a televised address. "If it diminishes by one drop then our blood is the alternative." Egypt gets 85 per cent of its fresh water from the river.

The Ethiopian government insisted the Nile was safe as the Renaissance dam was intended to generate electricity rather than for irrigation. In the diplomacy that followed the rhetoric, the two countries agreed to deepen existing consultations on the downstream impacts of the dam. Yet, the conversation around the "Grand Ethiopian Renaissance Dam" is no longer a technical examination of project parameters, but a reconfiguration of political power along the Nile basin.

Colonial Framework

For Ethiopia, the dam has emerged as the symbol of a resurgent nation determined to play its apparently destined role in Africa. The once conflict-torn nation has enjoyed 20 years of relative stability in which its population is estimated at 94 million in 2013, making it the second most populous African country after Nigeria. For Egypt, the inevitability of the construction points to a moment of fragility of a

once powerful international force. For the eight other riparian nations, Burundi, DR Congo, Kenya, Rwanda, the Sudans, Tanzania and Uganda, the dam has triggered a much needed conversation: A colonial water-sharing framework guarantees Egypt almost two thirds of the Nile's yearly flows, and gives it the power to veto any projects on the river even as it denies all other nations, except Sudan, the right to draw water without prior permission.

"I think it would be important to have discussions... in a new context," said African Union Chairperson Nkosazana Dlamini-Zuma at a recent press conference, "Not in the context of the colonial powers but in the context of pan Africanism and African renaissance."

"The Sudan," General Charles Gordon wrote in 1884 as he recommended the British abandon the colony, "is a useless possession, ever was so, and ever will be so." By 1898, the British were back in the country, eager to secure the Nile waters for their Egyptian assets. In time, the path of the White Nile was secured, but Ethiopia was drawn into a triangular contest between the French in Djibouti, the English in Egypt and the Italians in Somalia. Control of Ethiopia, wrote historian William Langer in 1936, implied control of the Nile, Egypt and the Suez Canal.

In May 1902, the English signed an agreement with Emperor Menelik to not construct any dams across the Blue Nile without British consent but subsequent Ethiopian monarchs claimed the treaty was never ratified. In 1929, the Egyptian protectorate signed an agreement with British Sudan, granting Sudan the right to build an irrigation project on the Nile on the condition that Egypt reserved the right to veto any future projects in any British colony and that her historic claims as the primary user of the river were acknowledged.

But in the interim, in 1927, *The New York Times* reported that an American company had signed a $20 million contract with Emperor Ras Tafari to build a dam at Lake Tana. The British and Egyptians initially opposed the dam — claiming they weren't consulted — but by July 1933, the Egyptian Cabinet offered to contribute £50,000 for further studies of the project, much like how the Egyptians are pushing for further studies on the Renaissance dam today.

Two years later the Italians invaded Ethiopia. The Second World War began soon after, and plans for the dam were shelved indefinitely. After the war, Egypt's revolutionary military government nationalised the Suez Canal and in 1959 signed a water sharing agreement with Sudan. Soon after, Egypt built the Aswan High Dam, and the arrangement has since persisted.

"At the time of the colonial era those agreements were reached...and gave Egypt 55.5 bcm, they gave Sudan 18.5 bcm and the rest was for evaporation. For us, we are to have nothing," said Uganda's Ambassador to Ethiopia and the African Union, Mull Sebujja Katende. Uganda — which adjoins Lake Victoria, one of the White Nile sources — gained independence in 1962, after the Nile agreements were signed.

In 1999, the Nile riparian states set up the Nile Basin Initiative as the first step towards creating a Cooperative Framework Agreement (CFA) that affirms each country's right to use the river water flowing through its territories in a reasonable manner. The treaty shall enter into force once six nations ratify it. Ethiopia ratified the treaty last month; Uganda, Mr. Katende said, intends to do the same.

"What we were in 1962... is not where we are. Things are changing," Mr. Katende said, "People are now talking of cooperation, integration and that is a weight you cannot undermine. You may be Egypt, but the others can match you – that is the point."

Perhaps the most intriguing piece of the Nile puzzle is that, despite building Africa's largest hydropower project on the river, Ethiopia is the least likely to substantially eat into Egypt's water supply. The Renaissance dam is 25 km from the Sudan border and so is unlikely to be used for

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consumptive purposes like irrigation. Egypt's major headache is how Ethiopia chooses to fill the giant 74 bcm reservoir.

In Flood and Drought

"Both Egypt and Ethiopia have a legitimate point. The Ethiopian point is correct that this dam will not cut Egypt's water supply after the Renaissance Dam is completed because Ethiopia will want to release water in order to generate hydropower," said Dale Whittington, a professor of environmental sciences and engineering at the University of North Carolina, U.S., "Egypt has a legitimate concern about how the reservoir is filled and also how the reservoir will be operated during periods of future drought."

"There is no fixed impoundment date for filling the reservoir," said Semegnew Bekele, the project manager of the dam, adding that the dam would be complete by 2017 and the reservoir would be filled in tandem. The Ethiopian government has said the reservoir would be filled in five to seven years — which would imply a diversion of between 10 and 15 bcm, or between 20 and 25 per cent, of the Blue Nile's yearly flow.

If Ethiopia chooses to fill its reservoir in years when the river is high, excess floodwaters can simply be diverted into the reservoir. By contrast, filling the dam during a period of drought shall have serious repercussions for Egypt and Sudan.

Prof. Whittington points out that the Renaissance Dam and Egypt's Aswan High Dam need to be viewed as two offsetting parts of a larger hydrological system. "It is a subtle message to convey but is very important," he said. "The Aswan High Dam reservoir will gradually fall over the period as Ethiopians fill their dam, but it will build back up once the Renaissance Dam is full."

At current levels, the reservoir at Aswan loses about 14 bcm a year to evaporation.

Once the Renaissance dam is filled, the Aswan reservoir will run at a lower level, losing less water through evaporation and will compensate for evaporation losses from the reservoir behind the Grand Renaissance Dam. Evaporation losses from the Renaissance reservoir will be lower than at Aswan because the surface area is less and the climate is somewhat cooler.

The fallout of the Grand Ethiopian Renaissance Dam can be managed by close coordination between the two countries, but Egypt will find it much harder to accommodate the demands of the countries along the White Nile.

⇒ **A Round Table in the Indian Ocean**

Seeking to leverage the growing strategic importance of the Indian Ocean and give new purpose to their 15-year-old regional association, countries in its littoral spanning three continents have launched an ambitious effort to find a common economic agenda.

Despite the challenges inherent in this task, ministers, officials and business delegations from the 20 countries of the Indian Ocean Rim Association for Regional Cooperation, who began a two-day meeting in Mauritius on Thursday, were optimistic that their common stakes in the region could lead to successful economic cooperation.

The spirit of what they had set out do was perhaps best captured by Taira Masaaki, Parliamentary Vice Minister for Economy, Trade and Industry in Japan, which is a dialogue partner of the IORARC. He gave the example of his country's automotive industry working through a supply chain that transcends national borders and promotes integration in its own way.

"The parts and components manufactured in Thailand and Indonesia are assembled in India and Australia and sold in Africa and the Middle East," Mr. Masaaki said as he highlighted Japan's interest in the IORARC's agenda.

The reality checks came from Ficci's Naina Lal Kidwai, who is leading the Indian business delegation. Tariffs, import restrictions on particular products, and the absence of a clearing

mechanism for trade in local currencies, were some of the challenges for increasing trade in the region, she noted.

Ms. Kidwai also spoke about the need to diversify and expand the exports basket for better trading opportunities.

Minister of Commerce and Industry Anand Sharma, who is leading the Indian delegation, spoke of how the balance of world economic growth had shifted from the "North-West axis" to the global south, particularly the Asia-Pacific region.

This put the IORARC countries, with their combined GDP of $6 trillion (in 2011), in an advantageous position to create new pathways of cooperation not only among member-states, but with other regions, for the "shared benefit of economic development".

Mauritius Prime Minister Navinchandra Ramgoolam, who was a founding member of the IORARC back in 1997, also sounded a note of urgency about the need for the IORARC, whose members range from Australia to countries in Africa and Asia, to take up the challenge.

Pointing to the proliferation of free trade agreements across the world — the trans-Pacific Partnership, and the recent decision by the EU and the United States to negotiate a Trade and Investment Partnership — Mr. Ramgoolam warned of being sidelined by the new economic map of the world.

"Can we afford to be marginalised within the emerging trade and economic configuration that will characterise the 21st century global trade and economic architecture? Of course not. Going on as before is not an option," he said in his inaugural speech.

The uneasiness among some member-countries about an IORARC free-trade area, as some were already in such agreements with other countries, Mr. Ramgoolam said, should not prevent the group "from exploring the best possible arrangements" to foster trade and investment "in a structured manner and with clear commitment".

He urged the group to explore the possibility of adopting "a variable geometry approach".

Mauritius — the co-host of the event along with the IORARC chair India — is particularly keen to position itself as the main platform for the increasing financial investment in Africa. Foreign Minister Arvin Boolell spoke of a proposal to set up trade and investment promotion agencies on the IORARC platform.

⇒ Is the United Nations Racist?

Ask it quietly, but ask it we must. Is the United Nations racist, either deliberately or unconsciously? Many years ago, the late Sergio Vieira de Mello, universally admired as one of the brightest and best U.N. officials, was pulled out of the Balkans because the Europeans would not accept a non-European as head of the U.N. mission there. This despite the fact that in personality, outlook and ways of thinking, he was more European than most Europeans. Their stance might have had credibility if, by the same logic, Europeans excused themselves from serving as heads of U.N. missions outside Europe. In fact, westerners dominate this category.

Double Standards

We have seen the same double standard, rooted in the belief in the innate superiority of the westerners, in the choice of the chief executives of the World Bank and the International Monetary Fund. The former is always headed by an American. On any objective measure, the U.S. nominee last year would not have made it to the short list against the other two main candidates from Africa and Latin America. But under the cosy EU-U.S. arrangement, the American candidate got the job. This causes neither Americans nor Europeans to blush when they lecture others on good governance norms.

When Dominique Strauss-Kahn had to resign in the wake of a sex scandal, his successor as IMF chief was another French nominee. Again

without blushes, where all the years previously they had justified the self-serving arrangements on grounds of how well Europe had done economically, this time it was because only a European could understand the grave crisis afflicting the eurozone and lead the IMF.

The position of U.N. Secretary-General (SG) is protected against such shenanigans by the rotation principle whereby each continent gets its turn for the top job. But almost all the top U.N. posts after that, at the ranks of deputy, under and assistant secretary-general, are within the personal discretion of the SG to fill. The same applies to the large number of his special representatives and envoys.

Unlike the parliamentary system of government, the top ranks of this international civil service are not filled by career officials. Instead the practice is closer to the U.S. system where the President gets to choose his own senior people. But in the U.S. system, senior appointments, including ambassadors, are subject to independent confirmation by the Senate. The U.N. practice does not have any comparable check on whimsical and unsuitable appointments.

Ban Ki-moon has been commendably conscious of and good at appointing women to the senior ranks. But both he and the system are yet to be sensitised to the fact that the top-level under-representation of non-westerners is even worse. The situation persists not just because western donor countries use money power and are more focussed in lobbying for their nationals. An even more telling explanation is that the developing countries fail to act in pursuit of their collective interest, are not equally committed to backing their own, and do not wish to jeopardise their own individual chances of a cushy U.N. post.

Remarkably, many commentators seem to believe that the alleged waste, inefficiency and corruption in the U.N. system is rooted partly in affirmative action policies that prioritise incompetent and unqualified personnel from developing countries in recruitment and promotion. When I looked into the statistics almost a decade ago, I was astonished at the reality as compared to the myth. Almost all the powerful and big-budget senior posts in the Secretariat and in the U.N. system are filled by westerners, including peacekeeping, political and humanitarian affairs, management, development and environment programmes, children's fund, refugees, etc. I suspect that for the same ability, qualifications and experience, western U.N. officials can expect to retire two ranks higher than the rest.

Asians contribute about half the U.N.'s total peacekeepers and one-quarter of its regular and peacekeeping budget (although most of this comes just from Japan). They have also suffered around one-quarter of total U.N. peacekeeping deaths. Yet a decade ago, two-thirds of senior peacekeeping officials were westerners. In the U.N. Secretariat overall, Asians comprised a mere 17 per cent of senior U.N. staff at the grades of director and above. This for a continent that accounts for well over half the world's population, is not short of experienced and sophisticated diplomats, and has many high achievers. Between them, Canada and the U.S. had the same number of senior staff in the Secretariat as all of Asia, when they account for 5 per cent and 60 per cent of the world's population respectively.

A decade ago, Asians comprised a mere 12 per cent of high-level representatives. Today, according to the list available on the U.N. website, of the total of 94 special representatives/envoys of the SG, 16 per cent are Asian, 30 per cent African (almost all dealing with African crises), 2 per cent from Latin America and the Caribbean: and 52 per cent from Europe, North America and Australia with nine out of ten of them dealing with non-western and global problems. This is like western scholarship. If you are western, you can tackle any topic or region. If you are non-western, you are expected to inhabit the intellectual ghetto of your own country or continent.

Consider three specific examples. To avoid being misunderstood: my comments do not apply to particular individuals. We would have been rightly outraged if the first two heads of U.N. Women had been men, no matter how capable the individual might have been.

Why is there no matching outrage and unacceptability when the head of the Development Program is a westerner? No matter how well intentioned, they cannot possibly know the political and social imperatives driving development strategies and policies. This is compounded by having an American as a special adviser on development goals. A practising economist from a developing country would be an infinitely superior choice, instead of people whose knowledge of development is derived from books or as an aid donor. The developing-country background and experiences of Mahbub-ul Haq and Amartya Sen were crucial, not incidental, to the emergence and enduring appeal of the notion of human development.

The only part of the system that has its global headquarters in Asia is the U.N. University. Only one of its six chiefs to date has been Asian, when equity and justice would have seen only one non-Asian. On every table of university rankings, the Asian universities (although not, alas, Indian universities) have made the most dramatic progress. Asian university presidents and vice chancellors must be doing something right. How then to explain the bias against them?

Or take a third example, the responsibility to protect (R2P). The likely sites and targets of intervention in the foreseeable future will be developing countries. It is their people who will suffer if mass atrocities being committed are not stopped, or if geopolitical and commercial interventions are masked in humanitarian language. Conversely, people in developing countries will primarily benefit if interventions are motivated mainly by humanitarian concerns and executed responsibly. The interveners can come from advanced and/or developing countries.

Conversations on R2P should occur therefore first among the civil societies and governments of developing countries, and secondly between developing and advanced countries.

Norm Hijacked

And the SG's special adviser on R2P should be a powerful (public) intellectual from the global South. Instead we have had an American and now a Canadian. This is not going to help as sentiment firms that the norm, in whose origins Africans (Kofi Annan, Francis Deng, Mohamed Sahnoun) have played the most crucial roles, is being hijacked and appropriated by the West to serve the old and discredited humanitarian intervention agenda, or to pursue regime change (Libya, Syria).

Why, with numbers to put a stop to it, do developing countries put up with such clear and heavy bias and permit it to persist? One dispiriting answer might be that a particularly insidious consequence of the century of European colonialism is that non-westerners have themselves internalised the sense of racial superiority of westerners. My own extensive experience suggests that the immigration, customs and security officials in developing countries are more obviously racist than in the West.

Part of India's national identity is the self-belief in being a champion of developing countries. Is it prepared to take the lead in demanding an explanation-cum-correction of this anomaly in the U.N. system?

⇒ **Fear Unfounded**

With Britain recently deciding to proceed with draft regulations on the mitochondria replacement technique for preventing women from transmitting mitochondrial disorders to their children, the method joins the list of revolutionary fertility and embryology tools that have come under opposition and criticism. In the recent past, the somatic cell nuclear transfer (SCNT) method has faced much resistance on

ethical grounds. More than the real challenges of producing healthy organs for therapeutic use, it was the pro-life stand against the destruction of embryos for harvesting stem cells that grounded the path-breaking technique in many countries. In fact, phrasing the technique as 'cloning' had already prejudiced the public. Similarly, the idea of a woman, other than the mother, providing genetic material to a baby has not gone down well with everyone. As in the case of SCNT, opposition to the mitochondria replacement technique stems from the labelling — 'three parents.' While mitochondria from a healthy woman do provide some genetic material, the genes within do not in any way contribute to the working of the nuclear DNA that defines a person — in appearance and function. Mitochondria are the power producers of a cell and do not in any way contribute to the traits that make us humans. Hence, any fear that the latest development is a slippery slope that would lead to producing 'designer babies' is unfounded.

Another major concern is the long-term implication of using mitochondria from another woman as they are passed on from one generation to another. However, it must be noted that a woman contributes both nuclear DNA and mitochondria while a man contributes only nuclear DNA.

The inheritance of donated mitochondria, which are passed down the maternal line, will stop with the succeeding generation if the baby is male. While the concerns and fear are baseless, the benefits are significant. In Britain alone, around one in 6,500 children is born annually with a severe mitochondrial disease like muscular dystrophy. Current methods can only reduce but not eliminate the risk; no treatment is available either. It is important to note that the British government has to change the law before the technique can be used. Even after it is legislated by the end of next year, it will take a few more years for this tool to become clinically available in the U.K.; more research needs to done to find out the safest method that can be used. By engaging the public prior to decision-making and allowing only licensed clinics to offer the technique, Britain has once again shown the way to go ahead with such sensitive scientific advancements.

NEXT BIG IDEA IN THE INDIAN OCEAN

A free-trade area in the Indian Ocean may be a vision too far, but the big idea to emerge from a two-day regional conference was that economic cooperation in the littoral cannot be inward looking and must become a springboard for connecting with existing trade communities in Asia and Africa for its full potential to be realised.

The Indian Ocean Rim Association for Regional Cooperation (IORARC) has 20 members as diverse and far apart as Iran and Australia. As Commerce and Industries Minister Anand Sharma, who represented India at the conference, put it, the group embraces five distinct regions, and with them distinct regional economic communities — ASEAN in South East Asia, Saarc in South Asia, GCC in the Gulf, SADC and COMESA in southern Africa, to mention just a few. In keeping with this, the communiqué at the end of IORARC's first Economic and Business Conference committed the group formally to the concept of "open regionalism". That means that while member countries will be encouraged to bring down barriers to doing trade with each other, they can continue to be part of other regional trade groups with different arrangements. In turn, IORARC can leverage this connectivity for engagement with these organisations. For instance, Mauritius, a founding member of IORARC, and an enthusiastic driver of Indian Ocean economic cooperation, is also a member of COMESA and SADC. Next week, it hosts a trilateral these two organisations and the East African Community.

Several speakers at the conference underlined the potential for connectivity between IORARC and regional economic communities, including Mr. Sharma, Mauritius Prime Minister

Navinchandra Ramgoolam and Minister for Foreign Affairs, Trade and Regional Integration Arvin Boollel. But IORARC is an unwieldy organisation of countries at different levels on the economic development scale. Four of its members are in the LDC category. Though this was a ministerial level conference that also brought together business representatives, several countries were represented only by officials, and several countries were conspicuous for not sending any business delegations.

According to the communiqué, a Work Program in Trade Facilitation has been initiated by member states, through which it is hoped that intra-IORARC trade and commerce will pick up.

Trade barriers

Besides urging members to "minimise" trade barriers to facilitate intra-IORARC trade, it also urged member states to harmonise trade practices in line with international norms.

Some key areas in which the IORARC members hope for cooperation from each other are in tariffs, the food sector, standards, in setting up regional value chains, mining, pharmaceuticals and traditional medicine, and coordination among its EXIM banks.

This was the first time that the IORAC was bringing business delegations together and according to Ficci head Naina Lal Kidwai, there were more than 150 B2B (business to business) interactions. The big news of the day was that a Mauritius company tied up a $1m transfer of technology contract with an Indian pharma company in the course of these interactions.

Indeed, transfer of technology and "building capacity" in countries that needed them, were two themes that came up repeatedly.

IORARC also hopes that member-states will soon identify areas in which they cooperate to harness the Indian Ocean's resources. One of the sectors that was earnestly discussed was energy security. Minister Sharma underlined how the 57,000-km coastline that IORARC countries together could boast, was conducive for harvesting wind energy. But, as the Mauritius foreign minister pointed out, what was required was uninterrupted energy supply, and there was no better model for this than agreement for supply of petroleum products to Mauritius by India's Mangalore Petroleum Refineries Limited, which ensured "predictability of supply". "This is an example of what IORAC can do".

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Gist of YOJANA

⇒ **PSB: WHOLESOME ENTERTAINMENT-EDUCATION TRANSMEDIA STORYTELLING**

Public Broadcasting systems all over the world face an existential crisis, caught in the dialectical vortex of serving the public *and* private good, as an agenda-setter *and* democratizer, through technologies of broadcasting *andnarrowcasting,* while implementing programming that entertains *and* educates. Whether it is the BBC in United Kingdom, HK in Japan, Public Broadcasting Corporation in the U.S., the Kenyan Broadcasting Corporation in Kenya, or the Prasar Bharati Corporation of India, public broadcasters must question their meaning and purpose in a world run amuck by bits and bytes, big screens and handhelds, technological convergence and consumptive fragmentation. Digitization, privatization, globalization, localization, customization, democratization, are all here. And, to stay!

Amidst this cacophony of intersecting purposes and interests, shaped by converging technology, expanding connectivity, and consumer fragmentation, no one road map exists for public broadcasters to follow. The media and audience-scape in the present 21st century is a system far too complex for public broadcasters to engineer and orchestrate. There are far too many moving parts, closely and loosely coupled, orderly and chaotic, and both indifferent and sensitive to big and small shifts in technology, policy, and global and local exigencies. Further, historical, cultural, social, and political forces exert influence, direct and indirect.

The science of complexity would tell us that when systems are characterized by multiple, interrelated underlying connections and causes, higher order outcomes accrue not by massive machine-like engineering, but rather by charting a steady course, guided by few minimal specifications (Singhal, 2008; Lacayo, Obregon, & Singhal, 2008). In biological and natural systems, we observe many such manifestations of highly complex behavior guided by simple rules— as in flocking of birds, shoaling of fish, swarming of insects, or herding of animals. Birds and fish engage in complex swirling maneuvers by following a few simple rules: maintain equal distance with neighbours, steering in the general direction of where the mass is moving. From these simple rules, order emerges in a complex environment, allowing for adaptation, self-correction, and onward action.

In rethinking purpose in a complex world, public broadcasters in the 21st century, I would argue, need only focus on few beacons. In this article, I discuss one such guiding beacon: a striving for *Wholesome Entertainment- Education Transmedia Storytelling.* In so doing, public broadcasting systems can lead from the front, while continually adapting and self-correcting on the unfolding path.

Allow me to say more about what I mean by "Wholesome Entertainment- Education" and "Transmedia Storytelling," and let me illustrate with examples.

Wholesome Entertainment-Education Strategy

The idea of seamlessly integrating entertainment with education goes as far back in human history as the timeless art of storytelling. For millennia, music, drama, dance, and folk media have been used in every society for recreation, devotion, reformation, and instruction. However, "entertainment-education" as a purposive communication strategy is a relatively new concept in that its conscious use in radio, television, popular music, films, and interactive digital media has received attention only in the past few decades. (Singhal, 2013a; Singhal, Cody, Rogers, & Sabido, 2004; Singhal & Rogers, 1999; Wang & Singhal, 2009; Lacayo & Singhal, 2008).

In its initial decades, *entertainment-education* (E-E) was broadly defined as "the process of purposely designing and implementing a media message both to entertain and educate, in order to increase audience members' knowledge about educational issues, create favorable attitudes, shift social norms, and change overt behavior" (Singhal, Cody, Rogers, & Sabido, 2004, p. 5; also see Singhal & Rogers, 1999, p. 9). However, in recent years, with the exponential growth in the development and popularity of digital interactive entertainment, Wang and Singhal (2009) proposed a reformulation: "Entertainment-education is a theory-based communication strategy for purposefully embedding educational and social issues in the creation, production, processing, and dissemination process of an entertainment program, in order to achieve desired individual, community, institutional, and societal changes among the intended media user populations".

In radio, the most well-known E-E application occurred in 1951, when BBC began broadcasting *The Archers,* a British radio soap opera that carried educational messages about agricultural development. As the world's longest running radio soap opera, *The Archers* continues to be broadcast to this date, addressing contemporary issues such as HIV / AIDS prevention and environmental conservation.

In television, E-E was discovered more-or-less by accident in Peru in 1969, when the television soap opera *Simplemente Maria* (Simply Maria) was broadcast (Singhal, Obregon, & Rogers, 1994). The main character, Maria, a migrant to the capital city, worked during the day as a maid, and enrolled in adult literacy classes in the evening. She climbed the socio-economic ladder of success through her hard work, strong motion, and later developed seamstress ills with a Singer sewing machine.

⇒ **DEVELOPING THE INTELLIGENCE CAPITAL OF A NATION**

In frameworks of economics that follow Adam Smith, to measure 'the wealth of a nation' in terms of its GDP (the monetary flow into business for products and services offered), the term 'capital' is typically associated with *financial capital.* However, there has also been a growing recognition that money is only one ingredient of the *tangible capital.* We also need *physical capital,* such as natural resources, and going beyond the tangible, we need the intangible *human capital,* which includes such things as *social capital,* and *knowledge capital.*

The Wealth of a Nation: Money or Wellbeing?

It is not unlikely that at some stage in the future, mainstream economics will connect the idea of 'the wealth of a nation' to Aristotle and the Buddha's idea of 'wellbeing' *(eudaimonia* in Greek). This would require locating economics squarely in ethics rather than in business, and acknowledging wellbeing as real wealth. If so, maintaining and increasing the wealth of a nation would also need *ethical* and civic *capitals.*

My concern here, however, is not with money vs. wellbeing as wealth. What I wish to do is far more modest and limited. Setting aside the question of whether it is legitimate to measure

the wealth of a nation in terms of GDP, I wish to explore the concept of *intelligence capital* as a necessary ingredient in the pursuit of increased profit on products and services.

Knowledge Capital vs. Intelligence Capital

Just as the concept of wealth is impoverished in mainstream economics, so is the concept of knowledge in the terminology of, knowledge capital' in industry, government, and education. In this discourse, 'knowledge' points to *information* and *know-how* (e.g., technology), not an *understanding* of the world. It does not recognize, for instance, that an understanding of quantum mechanics and relativity theory is part of a nation's knowledge capital. Many people do not realize that building nuclear bombs and nuclear plants requires knowledge of quantum mechanics, that building Global Positioning Systems (GPS) requires knowledge of Einstein's theory (as opposed to Newton's theory), or that modern computers would not have come to exist but for Alan Turing's work on the mathematics of automata.

Now, knowledge by itself is unused money. The enterprise of maintaining and increasing the wealth of a nation through knowledge calls for the intelligence to *apply* that knowledge, to *critically evaluate what* is *alleged as knowledge,* and to *generate new knowledge.* This means that, even to pursue economic growth measured in terms of GDP, we must go beyond knowledge economy and knowledge capital, and acknowledge the need for *intelligence economy* and *intelligence capital.*

Intelligence, Education, and Intelligence Capital

Intelligence can be thought of as the *capacity to do things with our mind,* analogous to the capacity to do things with our body. To develop physical stamina, strength, speed, and agility, we need both nutrition and exercise. Likewise, to develop mental stamina, strength,

speed, and agility, we crucially need both mental nutrition and mental exercise. Mental nutrition is knowledge; supplemented by mental exercise, it develops the qualities of the mind that we call intelligence.

The term 'intelligence' has popular associations with IQ scores and with surface smartness that can impress an interview board. It is therefore important for me to clarify what I include under 'mental capacity to do things with the mind'.

Firstly, by intelligence, I mean an individual's mental capacities shaped by learning *(actualized intelligence),* not the genetic predisposition for those capacities *(potential intelligence).* In this sense, a professional mathematician has far greater mathematical intelligence than a high school student, and a high school student has far greater mathematical intelligence than a five-year old.

Secondly, granted that individuals vary in their potential intelligence, what is relevant for a nation's intelligence capital is the actualized intelligence. Regardless of a body's genetic potential, physical stamina, strength, speed, and agility need to be nurtured through systematic effort. The same holds for the capacities of the mind as well.

Thirdly, intelligence includes *memory,* which in turn includes *knowledge, information,* and *experience.* For instance, to make a recommendation or decision on the legitimacy of stem cell research, balancing the legal and the moral factors, a decision-maker needs the capacity for legal and moral inquiry, grounded in the knowledge of biology and medicine, and experience in handling such matters. All these strands are woven into what I mean by intelligence.

Suppose we accept the concept of intelligence as the capacity to do things with the mind as sketched above. Suppose we also accept that the function of education is capacity building. It follows then that the *primary responsibility of*

education is to increase the intelligence of the young, by helping them develop their potential intelligence into actualized intelligence, thereby contributing to the intelligence capital of a nation.

Multiplicity of Intelligences

To address the question, "How do we increase the nation's intelligence capital?" the very first step is to acknowledge the different facets of human intelligence. As Howard Gardner has persuasively argued in his book *Frames of Mind: The Theory of Multiple Intelligences* (see http://infed. org/mobi/howard-gardner-multiple-intelligences - and-education!), intelligence is *multifaceted*: different individuals have different kinds of intelligences: some have monetary intelligence, others have design intelligence, and yet others have musical, mathematical, conceptual, scientific, or person intelligence.

Gardner categorizes intelligences into the linguistic, logico-mathematical, bodily-kinesthetic, musical, spatial, interpersonal, and intrapersonal. A brief examination reveals that this categorization, while valuable, is not yet an adequate framework of the multiplicity of human intelligences. Take for instance, mathematical intelligence. It calls for the following capacities:

- inventing *mathematical objects, properties, relations*, and *operations*, either by abstracting from the external world, or by building on those that already exist in the world of mathematics;
- coming up with and articulating *definitions* of the above entities; articulating the *axioms* governing the world inhabited by these entities;
- contemplating on them and discovering plausible *conjectures;*
- *proving* those conjectures to establish them as *theorems*, by showing that they are logical consequences of the axioms and definitions, or of already proven theorems; and

- constructing *mathematical models* of the objects, properties, relations, and processes of the external world, and deducing their *logical consequences/ predictions.*

These capacities would all come under Gardner's' logico-mathematical' intelligence. Do we have evidence to believe that these capacities are different manifestations of a single form of intelligence, and are all strongly correlated? Ramanujam, the celebrated Indian mathematician, is a case in point: he had a genius for discovering conjectures, but no demonstrated intelligence for proving the conjectures, or for coming up with and articulating definitions or axioms. Such examples suggest the possibility that a person may have acute intelligence in some of these facets, but not in the others.

Extending this to the distinction between the intelligence for logic and the intelligence for mathematics, it is fairly clear that to be a high caliber mathematician, a person has to have a basic capacity for logical thinking. But this does not mean that the kinds of intelligences that go into the making of a high caliber logician and a high caliber mathematician are the same.

Is the intelligence for scientific inquiry the same as mathematical intelligences? It is true that mathematicians, and philosophers need a high degree of capacity to work with definitions. But scientists need a high degree of observational intelligence, not crucial for logicians and mathematicians. Likewise, it is not clear that the intelligences that experimental scientists and theoretical scientists need are the same. Granted that both Einstein and Hubble were great scientists, Hubble may not have had it in him to be a theoretical physicist. And a brilliant biologist may not have the intelligences to become an equally brilliant physicist.

Anyone who is dedicated to helping students develop the capacity for academic inquiry knows from experience that these diverse capacities vary across students, in both the

potential and the actual. It goes without saying that there would be similar variation within other kinds of intelligences as well. Within musical intelligence, the capacity to sing well and the capacity to compose music would call for different strands of intelligence. Intelligence for managing a research institution and for managing a McDonalds would not be the same

Nurturing Intelligences

Suppose we accept the idea of the multiplicity of mental capacities beyond Gardner's categories. How do we design an educational system that helps students develop the intelligences they will need in their professional, public, and personal life?

It is important to bear in mind that, with the exception of certain professional courses (like medicine, dentistry, or fashion design), it is not possible to predict what profession a high school or college graduate would go into. A physics degree holder may become a minister, a banker, or a journalist, not necessarily as a researcher in physics. Even an IIT graduate may become a civil servant or a CEO, with very little need for engineering skills or engineering knowledge.

Given this situation, it makes sense to develop in students a variety of intelligences that are transferable across domains, rather than training them for specific professions or for specialized higher studies. The skills of solving quadratic equations may be needed for graduate studies in mathematics, but are irrelevant for a bank manager or an IAS officer. However, the capacity to detect logical contradictions, which a good math education can nurture, is transferrable to any profession, and even public and personal domains. Likewise, the ability to check the steps in a mathematical proof, when generalized, would develop the broader capacity to check step-by-step reasoning in any domain. The dexterity to dissect a frog in a biology lab would not be relevant for a future psychiatrist or administrator; but the broader capacity to design experiments to test

causal claims would be of relevance to everyone. Making statistical calculations is useful only for those who need statistics in their professions; but statistical and probabilistic thinking is of value to every educated citizen. A detailed knowledge of Plato's theory of rebirth has no value for a doctor, but the capacity to make decisions that combine moral and pragmatic values, such as those of the legitimacy of stem cell research or of capital punishment is of value to every citizen in a democratic system. Education has the responsibility to aim at such transferable capacities of the mind that would contribute to the wealth of a nation.

A Curriculum to
Enhance Our Intelligence Capital

The core ideas discussed in the preceding sections lead to an obvious question: *What kind of syllabi, textbooks, classroom instruction, and examinations would best contribute to the goal of increasing the intelligence capital of a nation?*

I will restrict my remarks to syllabi, the component of education that shapes the design of textbooks, classroom instruction, and examinations. The syllabi of most educational programs expect students to have:

- *understanding* (an understanding of a body of knowledge); and
- *application* (the ability to apply that knowledge).
- The quest for an educational system that contributes to the nation's intelligence capital requires us to go beyond these, and include educational goals such as the following:
- *independent learning* (the ability to acquire knowledge from textbooks, other reading materials, and the internet, without having to depend on teachers);
- *critical understanding* (an understanding of the evidence and arguments that have a bearing on what is presented as "knowledge");

- *critical thinking* (the ability to critically evaluate what is claimed as knowledge);
- *independent inquiry* (the ability to look for answers to questions by gathering new information, and through reflection, thinking, and reasoning, on one's own);
- *innovative problem solving* (in design and policy, relevant for technology, engineering, medicine, law, management...);
- *decision making* (drawing on values, goals, constraints, moral principles, information, and knowledge); and
- *communication* (the ability to *use the spoken and written forms of language* for a variety of purposes, including those above).

Each of these components of education needs to be fleshed out in detail with great care. By way of illustrating what this would involve, I will explore the challenge of incorporating into school and college education one of these components, namely, *independent inquiry.*

Why Inquiry?

Why should we include inquiry in our curriculum? There could be many responses to this question, but let me pick one: the Indian constitution. Article 51 A(h) of the Constitution holds that Indian citizens have a fundamental duty "to develop the scientific temper, humanism and the spirit of inquiry and reform." If we begin with the premise that we have an obligation to fulfill what our Constitution demands, there are four items that we must pay attention to: scientific temper, humanism, the spirit of inquiry, and the spirit of reform. For the purposes of this article, I will restrict my attention to two of them: scientific temper, and the spirit of Inquiry.

I understand 'scientific temper' to be a mindset that underlies scientific inquiry, and is nurtured through the practice of scientific inquiry. It is useful to recognize that education also has a responsibility to develop mathematical temper (the mindset that accompanies mathematical inquiry), philosophical temper (the mindset that accompanies philosophical inquiry) and historical temper (the mindset that accompanies historical inquiry) as important traits of the educated mind. Since scientific, mathematical, philosophical, and historical inquiries are all forms of *rational inquiry,* I will focus on what these different tempers have in common, namely, the *rational temper.*

At the core of 'rational temper' is a commitment to the following canons of rational inquiry, together with a predisposition to follow them in our professional, public, and personal lives:

- Statements that are claimed as knowledge must not be accepted merely on the basis of *blind faith* in the 'authority' of the source of assertions, they must be *doubted and questioned.*
- Conclusions that are alleged to be part of our knowledge must be *rationally justified.*
- The body of propositions that are judged as knowledge must be logically *consistent,* and be maximally *coherent.*

If these canons are crucial to rational temper (and hence to the scientific temper), given that our Constitution requires educated citizens to develop the scientific temper, we must conclude that *our current educational system* is *unconstitutional.*·

⇒ **Why India needs a**
Freed-up Public Broadcaster

Why can't India produce a broadcast service to rival, the BBC, C or CCTV (Chinese Central Television)? Why are Prasar Bharati and its two children, Doordarshan and Akashvani, unable to command attention and respect in India or overseas?

As print-based news organizations close down, it becomes even more important that credible news-gathering operations survive. The world is digital, and every comer of the globe has

the potential to affect every other comer almost instantly. How stories are told to the world is substantially what "soft power" is all about.

India has the ingredients to create a world-respected news organization. It has vast experience in digital technology, television production and film-making. It has thousands of English-speaking, multi-lingual journalists who come in all shapes, genders, colours and sizes - an appearance for every occasion. It has Indian-origin communities from South America to Japan to provide its correspondents with local knowledge. It's a democracy with a history of struggles to achieve press freedom. And India has its non-aligned reputation going back *three* generations to lend it credibility.

So why are Prasar Bharati, founded in 1997, and its international television service, Doordarshan India (DDI), founded in 1995, such frail, aimless things? DDI is difficult to find, and if you do find it, you probably won't want to stay for long.

What prevents DDI from becoming the world-class service India and the world need? The answer is: the same things that make Doordarshan and AIR ponderous, uninspired and the broadcaster of last resort for listeners and viewers. As with much that's wrong with India, it would be fair to blame the British ... at least for initiating the problem.

When radio became the rage in the 1920s, the new medium had very different experiences in Britain and India. The times were similar to today's: no one knew where media was going, and radio, the new entry, looked especially dangerous to British rulers if it were to fall into the wrong hands. In Europe and the US, companies that had developed electronic expertise during the First World War looked for ways to make money out of radio sets. An obvious way was to get into the entertainment business: give people a reason to buy your radio.

In Britain, John Reith, a complex, driven Scot, got the job in 1922 of running the British

Broadcasting Company, a consortium of radio manufacturers set up to make programs that would induce people to buy radios (http://www.bbc.co.uk/historyofthebbc/resources/in-depth/reith_5.shtml). Within five years, radio had taken off. In 1927, when the licence of the British Broadcasting Company to use the airwaves expired, Reith championed the creation of the British Broadcasting Corporation, a government broadcasting monopoly with an independent board insulating it from government control.

Perhaps the crucial event in establishing the BBC's independence had been the national general strike of 1926 when BBC gained widespread respect by reporting the strike impartially. The right of the broadcaster to run its own news service and gather and transmit news was established, in spite of opposition from newspaper owners who feared the competition.

It is instructive to see how Indian radio developed during the time that Reith and his colleagues were struggling to create the BBC model. Radio in India owed a lot to the BBC - but vital ingredients of the BBC package were missing and have never been supplied.

In 1927, the year the Federal Communications Commission (FCC) was established in the US and the British Broadcasting Corporation in Britain, India got its first radio stations that broadcast regularly with a published schedule. They were commercial ventures, and they failed. The Government of India took over the Indian Broadcasting Company and tried to close it down in 1931, but reluctantly kept it going once the BBC started its global shortwave service in 1932. The British in India bought radios to keep in touch with "home."

In Britain, Reith argued that it was in British interest to build up the radio service in India, which he saw as a fine opportunity to communicate and educate. Conservative British civil servants in India, on the other hand, saw radio as a potentially dangerous tool for unrest, rumour and sedition. Films and newspapers were

troublesome enough. Nevertheless, Reith's lobbying got a BBC man, Lionel Fielden, lent to India as controller of broadcasting in the mid-1930s. He became an' acquaintance of Nehru and Gandhi, earned the suspicion of British officials and got the name All India Radio endorsed. When he left India in 1940, there were said to be 100,000 radios, and nine towns and cities had stations. This was no media frenzy: the population of India in 1941 was nearly 400 million - I radio for every 4,000 people.

The early history of radio in India contrasted with Indonesia and the Philippines. In Indonesia (then the Netherlands East Indies), the Philips company of the Netherlands pushed the colonial government to encourage radio transmission, which covered the whole archipelago by the time the Japanese arrived in 1942. In the Philippines, the US rulers allowed a commercially based radio system to grow up before the Second World War.

In India, on the other hand, the Nehru government inherited in 1947 a tightly controlled, severely limited All India Radio. Vallabhbhai Patel kept the Ministry of Information and Broadcasting in his own hands until his death in 1950.

One of Patel's early actions was to ban any performer from AIR whose "private life was a public scandal." Patel's two successors at the 18 Ministry were both elitist Gandhians - R. R. Diwakar (1950-2) the legendary V. Keskar (1952-62). ·

⇒ **COMMUNITY RADIO IN INDIA:**
OPPORTUNITIES AND CHALLENGES

We have been very privileged to have a democracy secure enough to support and encourage community radio in India. In 1995, the Supreme Court ruled that "airwaves constitute public property and must be utilised for advancing public good." The first community radio policy guidelines were subsequently released in 2003-04. These recognized educational institutions as eligible licensees and from 2004 to 2006, 104 educational institutions were granted licences, starting from Anna University in Chennai. In 2006, the guidelines were revised to include non-profit organizations and agricultural centres (Krishi Vigyan Kendras). However, there remains little awareness about community radio, as well as ongoing restrictions to its potential. In this brief article, we review the current situation in India, assess to what extent community radio can "advance public good" and acknowledge the limitations and government concerns. We then discuss issues of regulation and pricing, and appraise where India stands on the international scene-what can we learn, and what can we contribute? In the final section, we make our recommendations for the future of community radio in India.

Community Radio Today

To date, the Ministry of Information and Broadcasting has received 1200 new CR (community radio) applications. Out of 655 applications, 428 have just passed the initial stage, i.e. they are in receipt of a Letter of Intent, 91 have reached the final stage and are ready to broadcast, i.e. have signed a Grant of Permission Agreement with MoIB, and 148 are actually operational. If we analyze the ownership of the operational stations, out of 148, the majority (99) are educational institutions, Krishi Vigyan Kendras and State Agricultural Universities. Forty Nine are by non-profit organizations. Geographically, we see stations dispersed across Tamil Nadu, Delhi, Karnataka, Uttar Pradesh, Madhya Pradesh and Maharashtra. Naxalite affected states like Orissa, Jharkhand and Chhattisgarh, insurgency affected areas like North Eastern States and Kashmir, and states bordering Nepal, China, Bhutan, Myanmar and Pakistan have little or no community radio presence.

However, we need to investigate further why out of 1200 applications, 545 have been rejected. Is this because of incomplete or

insufficient applications, security concerns, financial concerns or other factors? Similarly, why is there a preference for educational institutions rather than NGOs? More research on why CR stations cluster

in certain states and. not others, is also necessary. Addressing these issues should help strengthen relations between government and the CR movement, and in particular provide guidelines to aspiring stations.

The Benefits of Community Radio

Community radio emerges out of a core set of principles or values that it is: Available and trustworthy alternative to mainstream media - in terms of news, information and entertainment.

A platform to enable participation of communities (of interest and defined by geographical boundaries). Participation can be in varying intensities - from lending voice to a program, to becoming decision makers on all aspects of management.

- A channel to document and keep languages and cultures alive on a daily basis.
- A means to promote values of access to education, economic and social justice, against gender, race, caste and class based violence and transparency in governance.
- Of priority to minority communities - including sexual, racial, religious, and linguistic minorities.

Most of these are all related to the *content* of community radio. In addition, the *process* of participation in community radio has its own benefits. Both these can contribute to "advancing public good" as stated by the Supreme Court in 1995. As human beings, expressing ourselves is an essential core of who we are. As technologies advance, the power to express ourselves - both in terms of "transmitting" or "speaking" and "receiving" or "being heard" sometimes gets distorted. Richer urban populations with access to a high speed broadband Internet connection can use voice, text, images, video to send and receive information. A slum or rural inhabitant is much less likely to have these options. Access to infrastructure, affordability of technology, steep learning curves, literacy barriers, are some of the factors which distort our ability to express and interact with each other. Some have called it lack of voice, lack of agency or disempowerment. Whatever one calls it, CR can become a platform for even those without literacy to easily express themselves, potentially restoring self-confidence, triggering dialogues and promoting transparency in various issues: it can be a two-way forum for clarification and discussion.

"Development" is a loaded term. While meanings attributed to the term have changed over the years, a widely accepted notion of development today would be where the individual has control over his/her life, particularly with respect to income, health and literacy. CR has the potential to do this, not only in terms of access to very useful, localized, contextual information (e.g. health, agriculture, nutrition) delivered by trusted intermediaries, but also in terms of skill and capacity building (radio production, IT skills, administrates, management etc). With a long term aim of self-sustainability, CR should also be a source of job opportunities, in line with NREGA. Finally, from one of the author's PhD fieldwork at *Namma Dhwani* CR in Karnataka, one of the biggest benefits which emerged was the self-confidence speaking publicly and 'engaging in the workplace gave to women. We therefore see the benefits of CR as limitless. However, we also understand there are concerns, which are addressed next.

Limitations

It is evident that CR in India, while creditable in the South Asia region, has much to overcome. If only 148 stations out of 1200 applications are operational, clearly there is some disconnect which we should address. Some of the limitations to the potential of CR are purely bureaucratic. We are sure that with streamlining of processes, as occurring throughout governance

in India, operating CR stations will become much easier.

The first is that currently communications is centrally governed, as per the Union List of the Constitution. This has implications for CR licensees, as all governance and management of the sector is by the MoIB and MoCIT at, New Delhi. This is clearly inconvenient for licensees' operating in parts of the country far away from Delhi.

Secondly, CR has both administrative and technical components. Due to necessary measures by different ministries, the current licensing mechanism can be lengthy and bureaucratic. The Letter of Intent is given by MoIB, the frequency allocation is given by MoCIT, the Grant of Permission Agreement is given by MoIB and then the Wireless Operating License is given by MoCIT. In addition, applications can be further delayed because of the involvement of Home Ministry, Defence Ministry, Ministry of Space, Law Ministry etc.

Thirdly, CR policy guidelines state that "emphasis should be on developmental, agricultural, health, educational, environmental, social welfare, community development and cultural programmes". We do not argue that this information is extremely useful, particularly if localized, contextual, and anticipatorily created. In addition, the premise of 50% community content is welcome but needs to be clarified. Equally, the prohibition of news and current affairs broadcasts limit the value of CR.

Fourth, educational institutions have had a head start from the 2003-04 policy guidelines and cities are now saturated in terms of frequencies. There are three reasons for this scarcity of spectrum. The Department of Telecommunications had informally announced in 2005-06 that a total of 6 frequencies would be reserved for community radio in a given location. Over the years, only 3 frequencies are now informally reserved for community radio. Transparency in reservation of FM frequencies for CR needs to improve. Secondly, there is a lack of clarity on channel spacing. The norm in India is to have a channel spacing of 800 KHz, which means that if a radio station A is allocated a frequency of 90.4 MHz, then the next available frequency is 91.2 MHz. This limits the space available in the FM band (88-108 MHz). Studies have shown that channel spacing of 200 KHz can increasingly be adopted on devices. Therefore even a safe decision of adopting 400 KHz channel spacing would free up much needed FM spectrum. The third and final reason is the license area guidelines. We need to work on formal CR guidelines. It is informally known that if a frequency is allotted in a given place, then that particular frequency is blocked (for others) for a radius of 100 kilometers. It is believed that this rule has now been relaxed to 50 km for rural areas, 30 km for semi-urban areas, and 20 km for urban areas. Yet the distinction between urban, semi-urban or rural and how these figures have been arrived at is unclear.

Fifth, CR has not been promoted on the scale of MNREGS or other social welfare initiatives. This is a golden opportunity as CR has unbounded potential as outlined above, and in fact, can work in tandem with the MNREGS or CSCs (common service centres). There is an urgent need to promote CR through public and private broadcasters 'and newspapers (including small and regional media outlets).

We appreciate that the greatest apprehension and why CR has been thus far limited, is the security concern. In 2010-11, 11 applications were received from Jharkhand State. Although MoIB had in principle approved these applicants (which implies approval from a screening committee), the applications were rejected at a Inter-Ministerial Committee level, where Intelligence Bureau officials cited terrorism in these areas. Similarly, there have been instances of applicants from Kashmir, Manipur, Chhattisgarh etc all being rejected because of broader security concerns. These

concerns are serious, and yet, they can be mitigated, as has been illustrated in Mexico and Sri Lanka (discussed further in the article). The Indian government is increasingly open to investing in infrastructure in sensitive areas. Jairam Ramesh, in late 2011, announced that the government will set up telecom towers in Naxal-hit areas, stating "the single biggest problem in all these districts is connectivity". We accept that in these cases, security concerns are not trivial, and stations have to be closely regulated, but this does not mean they should be marginalized altogether.

Regulation

As the CR sector in India is governed by "guidelines", which can be approved at the cabinet level, Parliamentary approval is not required. This is advantageous on the one hand, as reform has come fairly and relatively quickly - from the initial guidelines in 2003-04, it took two years for the revised guidelines to come into effect. The Ministry is currently reviewing the policy guidelines again. On the other hand, it does mean that policy guidelines have not had the scrutiny of formal bills submitted in Parliament. Much remains to be discussed, including fair and clear eligibility for NGOs, campuses, KVKs and SAU; technical issues such as 100 Watts ERP and 30 meters height of antenna; 50% of content to be locally produced in local language/dialect; content to be developmental, and prohibition on broadcast of news.

In terms of evaluation, in addition to the initial screening, we suggest that either government or its representative agent conducts continuous and ongoing monitoring and evaluation, identifying critical areas of improvement in participation, maintenance as well as any perceived problematic content. Evaluation can also check if stations are producing at least 50% of the content locally. Are they using the license to generate profit for the licensee institution? This can be done either on the basis of complaints - in which case the

remedy will be post-facto, or through periodic site check in which case remedies can be preventive. All CR stations sign a Grant of Permission Agreement with MoIB for a period of five years. At present, license renewal is automatic provided the applicant pays spectrum fees and completes administrative formalities. Evaluation can test if a particular licensee institution has used the spectrum well for the five year period and should be renewed, or whether there are more deserving candidates in the same location. The question of who conducts all these evaluations is critical. It would be ideal and more cost-effective if MoIB could support and promote self-regulation agencies like the Community Radio Association of India and Community Radio Forum of India.

Pricing

In CR, there are two aspects - one is a Grant of Permission Agreement which is valid for five years. There is no direct cost for this, except a one-time Rs. 25,000 bank guarantee. The other aspect is a Wireless Operating License from the WPC, of the MoCIT, which is priced at roughly Rs. 20,000 every year.

In early 2012, WPC announced a rise in spectrum fees for all terrestrial users of spectrum, on a formula basis. This meant that spectrum fee would be increased by a particular amount depending on strength of transmitter and height of antenna. FM stations run by communities, private operators and Prasar Bharti were all affected. However, the CR sector was probably the only sector which could not afford the fee hike - from Rs. 19,000 to Rs. 91,000. Following media attention, l?rotests and advocacy, Kapil Sibal announced in late 2012 that the spectrum fee would be rolled back to the existing Rs. 19,000, where it currently stands until September 2013.

While private FM stations go through an auction process to bid for licenses they still pay fixed costs for spectrum. However the dispute around spectrum fees for community radio has

raised the question of how much is a license and/or frequency for community radio really worth, especially in urban areas, where demand for licenses and frequencies outstrip the supply. It is noteworthy that Kapil Sibal, the Minister for Communications and IT has stated that the opportunity cost of waiving the fee hike is not more than Rs. 25 lakhs, and would be worth it compared to the benefit of empowered, informed and inclusive local communities.

International Experience: what can we share, what can we learn?

India is a CR leader in some respects in South East Asia, one of the first countries in South East Asia to have an explicit third tier of broadcasting. With clear guidelines and regulations, we are in a strong position to advise countries like Nepal, Sri Lanka, Bhutan, Pakistan, Maldives and Myanmar. However, in comparison to European, north American, Latin American and Australian community radio, we have much to learn, for example:

Many countries reserve part of the spectrum for community broadcasting, in order to provide equitable access to the spectrum which is considered as a valuable national resource. Notable examples include Colombia, Republic of South Africa, and Uruguay

Press in India is regulated by the Press Council of India, public broadcasting by Prasar Bharti and so on. Similarly it is advisable for an independent regulator, rather than ministries, to regulate, award and renew, or reject licenses for community radio. The Telecom Regulatory Authority of India (TRAI) may be a appropriate body for this purpose, just as FCC regulates local radio in the U.S and of com regulates community radio in the U.K.

In Germany, each state/province has the authority to allocate licenses for broadcasting in its jurisdiction. Since CR is so localized, this decentralization is advisable in India. Of course, frequency allocations, a nationally regulated matter, will have to be worked out, and further checks and balances will have to be provided to avoid politicization of community radio by local political interests. Similarly, it makes no sense to have a blanket channel spacing policy and instead we could look further to the U.S policy - if an applicant can demonstrate that he or she can "squeeze in" a radio station in a given location, without interfering with other stations, then that station is granted a license. This is critical if growth in FM is to be maintained in urban areas, where demand is higher than supply of frequencies.

Several countries in the West, including Canada, Ireland and Australia have a pool of funds either from citizens' tax money, or from obligation funds collected from commercial broadcasters, managed by an independent funding body. Some funding schemes support seed funds for new stations, while others support programming, development of minorities, diversity etc. While India is also in the process of developing a CR Support Scheme, overall regulation of the scheme needs to be assessed, as it is currently due to be under the jurisdiction of the MoIE and funds will directly come from the Govt, either through Planning Commission, or through the Union Budget. This may again mean unnecessary politicization. We should look to Canada, Ireland and Australia to see how these funds are administered.

CONCLUSION

India is often praised as the "world's largest democracy". The diversity of media is something we should justifiably be proud of. To some extent, the proliferation of community radio has been inspiring, and one that many other countries aspire to. On the other hand, we believe that the CR sector in India has not been able to explore its full potential, largely due to current processes and security concerns. While not trivialising the latter, we believe that the former can be simplified and the latter mitigated, and perhaps it is only a question of time. Given the size of our

country, the strength of the population, social, economic, linguistic and cultural diversity, India can be host to tens of thousands of community radio stations which truly reflect the plurality and diversity of our people.·

⇒ FUTURE OF COMMUNITY RADIO IN INDIA

In most of the democratic countries "media policies and broadcasting systems are undergoing changes in response to the demand to accommodate voices of the civil society and poor. Looking back, it can be said that broadcasting in India, for nearly eighty years has been dominated by hierarchical and paternalistic 'public' broadcasting fashioned around BBC model. Now, broadcasting has shifted to profit- oriented and market driven business model (Pavarala and Malik 2007: 243).

Government of India derived exclusive broadcasting rights over radio and later television from the colonial Indian Telegraph Act, 1885 at the time of independence. The historic verdict of the Supreme Court that airwaves constitute public property and must be utilized for advancing public good brought about unprecedented changes in broadcasting. The verdict more or less coincided with the "economic liberalization" and "privatisation of media" in 1992 adding further stimulus to change.

Both national and international support for community radio has been forthcoming in varying degrees. Non-government organizations (NGOs), educational institutions and community organizations have been supported for setting up of community radio from time to time though sustainability of community radio is often in doubt once external support is withdrawn. It has taken over several years for the Government of India to layout policy guidelines for community radio in 2005 for grant of licenses for setting up community radio stations in the country. (www.becil.netiPOLICY%20 GUIDELINES. pdf)

It may be mentioned that Government of India finally in November 2006 gave its seal of approval to the community radio policy. In 2007, Ministry of Information and Broadcasting, Government of India announced its resolve to have 4000 community radios under the new enabling community radio policy. The advocates of community radio felt that the approval of the community radio policy in November 2006 would unleash the potential of radio for achieving participatory development goals. Community radio as viewed is "owned and operated by a community or members of a community ... is characterized by .access, public participation in production and decision-making, and by non-profit listener friendly economics. The management of the station is in the hands of those who use and listen to it" (VOICES-UNDP 2004:2) Community Radio in its brief history, has come a long way. Today, there are reported 126 community radio stations operated and managed by non-government organisations (NGOs) and educational institutions.

Slow Growth of Community Radio

The obstacles in the expansion of community radio is manifold. Due to lack of political will the importance of community radio in economic and social development has been largely ignored. It must be emphasised that community radio by itself is neither an end nor an independent means to reach everyone for achieving social development. It has to be coordinated with ground level initiatives and has to be thought of as an additional arm and means of capacity building (VOICES-UNDP 2004:3).

Business and financial considerations in market driven media may be another major reason why the growth of community radio has been slow. License conditions also implicitly favour well-funded community radio stations as against inexpensive low power civil society supported community radio that run on shoestring budget. Although five minutes of advertising per hour is permissible by the Government on community radio, the advertisement revenue appears to be inadequate.

Community radio needs to cater to both urban and rural marginalized poor. It also requires a fair deal of technical and programming expertise, despite demystified and simplified radio technology. Hence, transfer of programming expertise and technical know how needs to be made available in a timely and regulated manner to promote and expand community radio.

Five functioning community radios in different parts of the country are described and discussed. The case studies will illustrate the potential of community radio for development in a highly stratified, culturally diverse and multilingual country. It is argued that no centralised radio broadcast can be useful where individual linguistic abilities are limited and day-to-day information needs are highly fragmented. It is in this context, community radio seems to provide the best solution to reach out, to have dialogue and two way communication between and among the community members and to the rest of the country and world. It also helps strengthen the democratic political system in a largely monolithic top down non-responsive bureaucracy.

"Radio Active," Urban

Radio Active in Bengaluru is a community radio launched in July 2007. In keeping with the tradition of promoting the welfare and betterment of society, the Jain Group of Institutions (JGI) , a conglomerate of 35 mission driven educational institutions launched campus community radio station. It serves the cause of progress and development of the community at large. *Radio Active* seeks to reach out to Bengaluru's masses on issues concerning health, environment, development, scientific awareness, social issues, among other issues in turn seeking to inform, educate, while entertaining the public (www. jgi.ac.inlradioactivel Aboutus.htm). Although *Radio Active* has a specific listener base, they are not defined by geographical area. Members from these groups act as producers of programmes and also form the listening club. Last reported, it had thirteen and a half hours of transmission a week, and has appointed two radio jockeys from the community (Chandran 2010). *Radio Active* has also currently launched several sponsored radio programmes for revenue generation. These radio programmes range from initiatives in solid waste management to management of street dogs.

Observations

None of the five community radios mentioned started as a community radio. They remain partially community radios. Hence, community radio is yet to emerge in the country to serve the local information needs. It is hoped that in the near future, once the Government of India starts giving license easily to civil society, popularity of community radio will be enhanced in the country. All the five community radios presented were externally supported without any assurance of sustainability. It is therefore important to find ways and means to provide sustainability to community radio. Community radio has been helpful to both rural and urban listeners, especially women in fulfilling some of the development goals.

Community radio is a process and cannot exist in socio-political isolation. Community radio is not simply about producing programmes to broadcast, it requires preparing and creating awareness and information of a community radio from the very beginning. Community radio is about developing a community-a neighbourhood cluster of villages or college campus. Despite the huge gap that exists between policy and ground level realities, the community radio will grow in the future. It is a matter of time. Due to 'slow and steady' expansion of community radio several of them will die out and a large number will be born. It is appropriate to give civil society the time to respond to this opportunity, so that they can utilize the medium in a more meaningful way, as it is meant to be.

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Gist of

KURUKSHETRA

⇒ **MICRO CREDIT-THE ENGINE OF INCLUSIVE GROWTH**

The Self Help Groups (SHGs) methodology was first developed in Karnataka in 1992 to link rural population to the formal financial sys. Now about 8.6 crore households have access to banking through SHGs.

Linking SHGs with bank finance has been identified as a key tool towards achievement of holistic inclusive growth. Despite the vast expansion of the formal credit system in the country, marginal farmers, landless labourers, petty traders and rural artisans belonging to socially and economically backward classes and tribes whose propensity to save is limited or too small to be mopped up by the banks, continues to depend on money lenders.

In order to minimize the dependence on money lenders, NABARD, APRACA and ILO have carried out a study and brought out the concept of SHGs and launched a pilot project supported by refinance. The criteria would broadly be adopted by NABARD for selecting SHGs:

- Membership of the group could be between 10 to 20 persons.
- The group should be in existence for at least six months.
- The group should have actively promoted the savings habit.
- Groups could be registered or unregistered.

What is Micro Credit?

Foreseeing the need of sustainable development for the improvised; Muhammad Yunus, the father of microfinance, popularized the concept of micro credit. Micro credit, being part of financial inclusion, is defined as the provision of thrift, credit and other financial services and products of very small amount to the poor in rural, semi-urban and urban areas for enabling them to raise their income levels and improve their living standards (as per RBI Master Circular, 2008). In India, the most flourishing testing ground of social entrepreneurship has been in the area of micro credit, and more recently microfinance. Culling from international literature empirical features of micro credit are:

- Quantum of loans is small,
- No collaterals are required,
- Rural and urban poor are the major borrowers, Ideally loans are used for income-generation through market-based self-employment,
- Loans are administered through borrower groups,
- Owing to NGOs' controlling disbursement as well the basic terms and conditions for sanction, they sometimes become private transaction.
- Less than 15 per cent of the households have any kind of insurance.
- Bankers feel that it is fraught with risks and uncertainties.
- High transaction costs.

- Unfavourable policies like caps on interest rates which effectively limits the viability of serving the poor.
- Lack of an appropriate legal vehicle.

Framework for Micro Credit

In India, there are two routes through which micro credit is provided to borrowers. The first is the "Bank-SHGs linkage programme" by which National Bank for Agriculture and Rural Development (NABARD) and commercial banks promote the formation of SHGs. Banks lend directly to SHGs, which, in turn, open group savings accounts in the banks. The second route is the "Micro Finance Institute (MFI) model", is the most important institution in the chain.

Why Micro Credit?

Providing credit is in the top priority for policy makers to achieve inclusive growth. Unless we are able to meet the credit needs of our people, we can never hope to grow in a sustainable way. Despite multiple agencies giving credit to the rural sector, the critical gap in rural credit still exists resulting in the exploitation of the rural masses by money lenders. The status of micro credit is as follows:

- Considerable gap between demand and supply for all financial services.
- Majority of poor are excluded from financial services.
- About 56 per cent of the poor still borrow from informal sources.
- 70 per cent of the rural poor do not have a deposit account.
- 87 per cent have no access to credit from formal sources.

The SHGs-8ank Linkage Programme

In 1991-92, a pilot project for linking about 500 SHGs with banks was launched by NABARD in consultation with the Reserve Bank of India. Since launching it as pilot project, it has proved its efficacy as a mainstream programme for banking by the poor who mainly comprise the marginal farmers, landless labourers, artisans and craftsmen and other engaged in small business like hawking and vending in the rural areas.

MFI Model

Microfinance refers to a movement that wants to provide low-income households a wide range of financial services, including not just credit but also savings, insurance and fund transfer. The Indian MFIs are among the fastest growing sector and most efficient in the world today and will continue to develop into an important delivery mechanism to reach out to the poor and empowering women. The role of MFIs is to enhance human capital and to evolve the bankable clients to make poverty irrelevant.

SHGs-bank linkage programme and MFIs model have become an important alternative to traditional lending in terms of reaching the poor and will continue to be an important delivery mechanism as:

- Poor people need not just loans but also savings, insurance and money transfer services.
- Microfinance must be useful to poor households: helping them raise income, build up assets and/or cushion themselves against external shocks.
- Subsidies from donors and government are scarce and uncertain, and so microfinance must reach to the large numbers of poor people.
- Microfinance means building permanent local institutions.
- Microfinance also means integrating the financial needs of poor people into a country's mainstream financial system.
- The key bottleneck is the shortage of strong institutions and managers.
- Donors should focus on capacity building.
- Interest rate ceilings hurt poor people by preventing microfinance institutions from covering their costs, which chokes off the supply of credit.

- MFIs should measure and disclose their performance - both financially and socially.

What is needed to be done?

Micro credit institutions should fund their loans through savings accounts that help poor people manage their myriad risks. Governments should provide an enabling legal and regulatory framework which encourages the development of a range of institutions and allows MFI to operate as recognized financial intermediaries subject to simple supervisory and reporting requirements. Usury laws should be repelled or relaxed and MFIs should be given freedom of setting interest rates and fees in order to cover operating and finance costs from interest revenues within a reasonable amount of time. MFIs on its own are unlikely to be able to address formidable challenges of underdevelopment, poor infrastructure and governance. It needs:

- Appropriate legal structures for the structured growth of microfinance operations.
- Ability to access loan funds at reasonably low rates of interest.
- Appropriate loan products for different segments.
- Ability to innovate, adapt and grow.
- Bring out a compendium of small and micro enterprises for the microfinance clients.
- Ability to attract and retain professional and committed human resources.
- Identify and prepare a panel of locally available trainers.
- Ability to train trainers.
- Capacity to provide backward linkages or create support structures for marketing.
- Finding adequate levels of equity for the new entities to leverage loan funds.

Micro credit institutions should fund their loans through savings accounts that help poor people manage their myriad risks. Governments should provide an enabling legal and regulatory framework which encourages the development of a range of institutions and allows MFI to operate as recognized financial intermediaries subject to simple supervisory and reporting requirements. Usury laws should be repelled or relaxed and MFIs should be given freedom of setting interest rates and fees in order Micro credit is not yet at the centre-stage of the Indian financial sector. The knowledge, capital and technology to address these challenges however now exist in India, although they are not yet fully aligned. With a more enabling environment and surge in economic growth, the next few years promise to be exciting for the delivery of financial services to poor people in India. Micro credit will continue to develop into an important delivery mechanism to reach out to the poor and achieving financial inclusion and empowerment of women. Its role in enhancing human capital is considerable. T objective of the micro credit initiatives must be to evolve the bankable clients to creditworthy clients, thus making concerns about poverty irrelevant.

⇒ **SCHEMES**

PROVIDING SUBSIDISED FOODGRAINS

Targeted Public Distribution System

Government of India makes allocation of foodgrains under Targeted Public Distribution System (TPDS) for Below Poverty Line (BPL) families and Antyodaya Anna Yojana (AAY) families @ 35 kg per family per month. Beneficiaries for the scheme are identified by the States on the basis of 1993-94 poverty estimates of Planning Commission and March 2000 population estimates of Registrar General of India.

Other Welfare Schemes

The Department of Food & PD also makes allocation of food grains at BPL prices for the following welfare schemes implemented by various Ministries/Departments of the

Government of India as well as State Governments/UTs:

Mid Day Meal Scheme

The Mid Day Meal Scheme is implemented by the Ministry of Human Resource Development. The Scheme covers students of Primary & Upper Primary Classes in the Government Schools/ Schools aided by Government and the Schools run by local bodies. Food grains are supplied free of cost @ 100 gram per child per school day where cooked/processed hot meal is being served or 3 kg per student per month were foodgrains are distributed in raw form.

Wheat Based Nutrition Programme

This Scheme is implemented by the Ministry of Women & Child Development. The food grains allotted under this Scheme are utilized by the States/UTs under Integrated Child Development Services (ICDS) for providing nutritious/energy food to children in the age group of 0-6 years and expectant/lactating women.

Rajiv Gandhi Scheme for Empowerment of Adolescent Girls 'Sabla'

The Ministry of Women and Child Development administers the scheme at the central level and State/UT Governments implement the scheme. The SABLA Scheme has been launched on 19.11.2010 by merging two schemes namely Nutrition Programme and Adolescent Girls (NPAG) and Kishori Shakti Yojana (KSY) in to a single scheme and proposed to be implemented in 200 selected districts across the country. The Scheme aims at empowering adolescent girls of 11-18 years by improvement of their nutritional and health status and upgrading various skills like home skills, life skills and vocational skills. It also aims at equipping the girls on family welfare, health hygiene etc. and information and guidance on existing public services along with aiming to mainstream out of school girls into formal or non-formal education.

The requirement of food grains under the scheme for nutrition is @ 100 grams of grains per beneficiary per day for 300 days in a year.

This Scheme is implemented by the Department of Food and Public Distribution through the State Governments/UTs. To meet the requirement of Hostels/Welfare Institutions, viz., N.G.Os/Charitable Institutions, an additional allocation of foodgrains up to 5% of the BPL allocation of each State/UT is made to States/UTs at BPL rates under this Scheme.

Supply of
Foodgrains for Sc/St/Obc Hostels

This Scheme is implemented by the Department of Food and Public Distribution through the State Governments/UTs. Under this Scheme, all residents of the hostels having 2/3,d students belonging to SC/ST/OBC are given 15 kg. foodgrains per resident per month.

Annapurna Scheme

This Scheme is implemented by Ministry of Rural Development. Indigent senior citizens of 65 years of age or above who, though eligible for old age pension under the National Old Age Pension Scheme (NOAPS) but are not getting the same, are covered under this Scheme and 10 kgs. of foodgrains per person per month are supplied free of cost.

Emergncy Feeding Programme

This Scheme is implemented by Department of Food and Public Distribution through the State Government of Orissa. The Scheme is being implemented in eight KBK Districts of Orissa covering 2 lakh beneficiaries and foodgrains (rice) at BPL rates are being allocated to State Government of Orissa. Cooked food containing, inter alia, rice-200 gms, dal (pulse)-40 gms, and vegetables-30 gms, is provided daily in the diet of each EFP beneficiary by the State Government.

Village Grain Banks Scheme

Village Grain Bank Scheme was earlier

implemented by the Ministry of Tribal Affairs in 11 States. However, since 24.11.2004, the scheme is being implemented by the Department Food & Public Distribution.

The main objective of the scheme presently being implemented is to provide safeguard against starvation during the period of natural calamity or during lean season when the marginalized food insecure households do not have sufficient resources to purchase rations. Such people in need of food grains will be able to borrow food grains from the Village Grain Bank. The grain banks are to be set up in food scarce areas like the drought prone areas, the hot and cold desert areas, tribal areas and the inaccessible hilly areas which remain cut off because of natural calamities like floods, etc. These villages are to be notified by the concerned State Government/ Union Territory. The scheme envisages inclusion of all willing BPL/AAY families in the villages to be identified by the State Government in food deficit areas. The quantity to be lent and the period of repayment is to be decided by the Group themselves. Village Panchayat/Gram Sabha, Self Help Group for NGOs etc. identified by the State Governments are eligible for running the Grain Banks.

⇒ **Termites Use in Ecosystem**

Everything .present on the earth is useful to human beings. But we always see termites as a nuisance to plants. They are often branded as enemies in agriculture. The pest management literature depicts termites as "pests". But actually, they are the builders of the soil, aptly known as 'soil engineers'. They create a huge amount of space in the soil that helps in improving the availability of air and infiltration of water into the soil. They are also used as food and feed, and have medicinal value. There is no doubt that some species cause significant damage to crops, trees, and structural timber.

But the ecological literature demonstrates their crucial role in ecosystems, as they playa

beneficial role through promotion of essential ecological processes. The ongoing interest in sustainable agriculture and food security highlights the need for a more balanced approach to termite control and maintenance of their ecosystem services. This article tries to put forth the importance of termites to human beings, especially in agriculture.

Myth behind Termite Attack

Termites are considered as intolerable pest around the world. Every year we use many tons of agrochemicals to manage these insects with little success. Many people think that termites would kill a plant or tree, which is a myth. Actually they eat away a plant while it is struggling to dry away due to lack of moisture. It is like mercy killing. They graze only on dead bark of the tree which otherwise could have encouraged fungus growth during rainy season. In reality, the termite hill built up with their saliva moistened mud is not only fertile but also a very good antibiotic. Many use this termite hill mud for bathing and shaving. The natives and traditional healers of Chhattisgarh use these termites both as medicine and food. Here, the natives collect the termite queen and sell it in local markets at fair rates. In many African countries, it is applied in the pit before planting saplings as because of its fertility.

Various Termite Species

Termites are a large and diverse group of insects consisting of over 2600 species worldwide. They belong to the order Isopteran. On the basis of nesting behaviour two types are found - soil nesting termite species including mount building species and subterranean species, and non-soil nesting species i.e. tree nesting species. Termites are reported from all zoogeographical regions of the world, but most of the termite species are known from the tropics. With over 660 species, Africa is by far the richest continent in termite diversity. Most of the known genera and those species that damage crops, trees, and rangeland belong to the family

Termitidae. This family consists of four subfamilies: Macrotermitinae, Nasutitermitinae, Termitinae, and Apictotermitinae. Although the exact number of pest species is not known, it is estimated that only less than 20% of members of the family Termitidae are serious pests (Pomeroy et al. 1991).

Uses of Termites
Conserves Ecosystem

It must be noted that the pest activity is a part and parcel of the termite's beneficial role in various ecosystems. Various studies in South Africa shows that Macrotermitinae collect up to 60% of the grass, woody material, and annual leaf fall to construct the fungus gardens in their nests. This translates to 1.5 tons of litter removal per hectare every year, which leads to a dramatic reduction in "fuel load" and fire intensity, while at the same time preserving nutrients in terrnitaria beyond the reach of fire. By breaking down up to 100% of the litter fall and mineralization of up to 50% of the net primary production, termites influence ecosystem services such as nutrient cycling and biomass production. From this viewpoint, termites are beneficial for the functioning of forest and savannah ecosystems. Termites also playa significant role in the availability of nutrients and water to crops and trees, and hence the productivity of agricultural ecosystems (Black and Okwakol 1997). There is also evidence of a role in the N-cycle, especially symbiotic nitrogen fixation, which may be the primary contribution of some of the associated microbes, rather than the degradation of lignocellulose.

Helps in Land Management

The combined effect of organic matte depletion due to overgrazing, continuous cultivation, and adverse climatic conditions has resulted in severe soil degradation. Water runoff on these soils will be also very high. In this situation, sometimes the use of heavy machinery become inappropriate, may be due to the high cost of this technology, or due to the weak structure of certain soils. But the presence of termites may help to increase the aeration and fertility of the soil. The termites open many burrows through the sealed surface of the soil. Throughout the soil profile, they create big pores with irregular shapes and different diameters. Soil structure, aggregation and other physical properties will slowly improve. To invite termites, applying mulch is a more sustainable and affordable option for farmers. Mulch application triggers termites to rework the soil and refill with life (Normally, termite species attracted by dry mulch will not destroy fresh crops in the field The termite species that destroy crops are mainly root feeders whose occurrence does not depend 0n mulch application).

Helps in Water Retention

Literature indicates that termite mound soil generally have high clay content, enhancing water storage capacity. When termite mound soil is spread on low water retention capacity soils, it result in a higher soil moisture content and improve crop growth. The plant biomass and grass growth near termite mount will be high due largely to accumulation of runoff water at the base. Not only could this lead to increased productivity during dry years, but it could also make it possible for plants to survive intense drought.

An indicator for
Soil fertility and water availability

Subsistence farmers largely base their nutrient management strategies on their perception of niche fertility. Within field variability of soil properties create niches that farmers perceive as essential to their farmers. Termites, specifically the Macrotermitinae, create such niches and in most cases help farmers to reduce risks of crop failure. Thus, farmers use termites as biological indicators of soil fertility status. Traditional soil classification is also based on termite presence or absence among some

communities. In Chattisgarh, the farmers of forest areas choose new land for cultivation by observing the Termite mound. The height of mount is considered while selecting the land for tuber and seed crops. It is common belief in Chhattisgarh that the presence of Termite Mound in any land, indicates the presence of sufficient amount of ground water (Oudhia P, 2003). If they found termite mount and koha tree in the same land, they never leave it without cultivation.

Termites as Fertilizer

Farmers in many tropical countries have traditionally used soil from termite mounds as fertilizer, but this practice was abandoned when subsidized inorganic fertilizers became available all over. Farmers apply termite mound soil to the field where they plant maize, soybeans, cowpeas and other local cereals and legumes. They do this once every three years. Literature shows that termite mound soils have high levels of calcium, phosphorus and organic matter, which also contribute to better crop development, especially on the poor soils. Various studies show that plants also take up nutrients very easily from termite mound soil. In Africa, termite soil is proving a viable option to local farmers who can not afford to buy expensive inorganic fertilizers. While taking the mount, they make sure that they leave the base intact so that the colony is not destroyed. Most research shows that termitaria contain significantly higher concentrations of total nitrogen (N) and exchangeable cations than the surrounding area. In addition, soil from termitaria has other positive effects on crops such as suppression of weeds (Andrianjaka et al. 2007).

Termites as Alternative Fuel

Scientists and several companies are currently experimenting with using termites to convert wood, corn stalks and other plant waste into ethanol in an effective and economic way. The hope is that through the study of a termite's unique digestive processes and selected microbes, pollution-free energy may be developed to help solve the world's imminent energy crisis. The United States is investing hundreds of millions of dollars in alternative fuels, part of it being spent on termite research (Evans C. 2007). A termite's intestines take indigestible cellulose, which makes up the bulk of all plant material grown on earth, and convert it to ethanol, a versatile and popular fuel. The US already subsidizes farmers to grow corn for ethanol, but the process isn't carbon- neutral or safe for the environment. But termites can convert 95% of what they consume into energy within 24 hours by using the bacteria and protozoa that inhabit their digestive tracts. Supporters of alternative energy sources believe that energy companies may be able to produce ethanol easily and inexpensively through the use of termites.

Termites as Medicines

The investigation reports of termite mounds and nearby soil extracts collected from three different sites of South India, describes the antibacterial activity of *Odontotermes formosanus*. In Chhattisgarh, a few species like Microtermes sp: Odontotermes sp: Coptotermes sp. and Trinervitermes sp. is the dominant species. In this place, over 550 traditional healers are aware of various medicinal uses of Termite queen. The natives and healers are aware of these uses and using it in their regular practice. Now many enthusiastic young Homoeopaths of Chhattisgarh are trying to prepare a drug from Termite queen. They have submitted a research project for the clinical trials. In southern parts of Chhattisgarh, the soil from termite mound is given in very small quantity to the pregnant woman to assure safe delivery. According to the healers, its use helps in making the complexion of new born, fair. The soil is also used as veterinary medicine, in treatment of many common diseases particularly in Foot and Mouth (F & M) disease (Oudhia P,2003).

Termites as Food

The literature reviewed indicated that

farmers have extensive knowledge of the value of termites in human nutrition. The alates, queen, and soldiers of some species in the subfamily Macrotermitinae are eaten across most of Africa. Local people easily ell the edible termites from those unsuitable for consumption. Consumption of soil from termitaria is common among the nutritionally vulnerable populations, especially children and pregnant and lactating women. Among the positive health benefits during pregnancy are improved maternal calcium status, improved foetal skeletal formation and birth weight, reduction in pregnancy-induced hypertension, and decreased risk of embryonic exposure to teratogens and loss of nutrients through emesis (Wiley and Katz 1998).

Termites as Poultry Feed

The poultry farm owners are using the winged termites as feed. The owners collect the winged Termites using light traps and use it as poultry feed. They informed that the poultry birds are fond of this seasonal dish and for their health it is good (Oudhia P. 2003).

Termites as Diet for Animals

Termites form the major dietary component of many animals, including invertebrates and vertebrates. It is the most nutritionally important insects in the diet of chimpanzees and gorillas. It forms a major source of food for many amphibians, reptiles, birds, and mammals. In addition, many animals including birds, reptiles and mammals nest in termitaria. Termitaria usually act as grazing and browsing hotspots for herbivores. Therefore, indiscriminate use of pesticides on termitaria may put the health of animals at risk.

Conclusion

Many local communities have comprehensive indigenous knowledge of termite ecology and taxonomy. Many communities also have elaborate knowledge of the nutritional and medicinal value of termites associated with termite nests. In addition, farmers use termites as indicators of soil fertility, and use termite mound soil in low-risk farming strategies for crop production. But the termite control measures adopted under the present farming system is harming the environment. Considering the many uses, the management of termites in future should be built on farmers' indigenous knowledge and adequate understanding of the ecology of the local termite species. There is also a need for scientific investigation into the various indigenous uses. Unfortunately, we have yet not started work on this important aspect.

⇒ ASHA the New hope of HEALTH CARE DELIVERY IN RURAL INDIA

Awareness about health care programmes an facilities is the essence for the success of any health care initiative which is closely linked with hum development. The Government launched the *National Rural Health Mission* in 2005 to provide accessible, affordable and quality health care to rural population. One of the key components of the Mission is to provide every village with a trained female community health activist called ASHA or Accredited Social Health Activist.

ASHA is selected from the village itself and is accountable to it. ASHA acts as a bridge between the ANM and the village. She is accountable to the Panchayat. She is an honorary volunteer, receiving performance-based compensation for promoting universal immunization, referral and escort services for RCH, construction of household toilets and other healthcare delivery programmes. She facilitates preparation and implementation of the Village Health Plan along with Anganwadi worker, ANM, functionaries of other Departments and Self Help Group members.

ASHA works as an interface between community and the public health system. ASHA is the first port of any health related demands of deprived sections of the population, especially women and children who find it difficult to

access health services in rural areas. ASHA programme is expanding across states and has been successful in bringing people back to public health system, increasing the utilisation of out-patient services, diagnostics facilities, institutional deliveries and in-patient care.

ASHAs are central feature of National Rural Health Mission (NRHM) community based health care delivery. They are widely accepted as the most visible face and one of the most successful components of NRHM. Till date more than 8.85 lakh ASHA workers have been selected, trained and deployed across the country. ASHAs perform the role of facilitation, activism and community level care. Their work includes counselling on improved health practices and prevention of illness and complications and appropriate curative care or referrals for pregnant woman, newborn, ill children as also for malaria, tuberculosis and other conditions. Other than this, ASHAs have also been engaged in the social marketing of products such as sanitary napkins and spacing contraceptives. To enable ASHAs to perform these roles, most states have established the institutional structures required for training and support. What more needs to be done is strengthening these structures to perform effectively.

ASHAs are effective in reaching about 70 percent of the population with their services but a substantial 30 percent still remain unattended. A training booklet has been disseminated to state governments to help ASHA in reaching marginalised populations in her area. Incentive package for ASHAs has been increased and payments are being streamlined.

ASHA facilitators are an integral part of the ASHA programme and are to be deployed before the selection of ASHA. An intensive induction training programme of 23 days in 5 episodes is given to the ASHA worker. After a period of six months of her functioning in the village she is sensitised on HIV/AIDS issues including Sexually Transmitted Diseases, Reproductive Tract Infections, prevention and referrals. She is also trained in new-born care. The Central Government bears the cost of training, incentives and medical kits. The remaining is funded through central assistance given to state governments under this programme. Over 7.99 lakh ASHAs have been provided drug kits so far. These kits contain Generic AYUSH and allopathic formulations for common ailments which are replenished from time to time. Most states are also in the process of distributing an equipment kit to ASHAs for providing home-based new-born care.

An evaluation study commissioned by the Planning Commission has revealed that more than 65 percent beneficiaries are visited by ASHA once in 15-30 days. 80 percent beneficiaries have confirmed delivery of free drugs by ASHA. 65 percent beneficiaries have opted for institutional delivery and 60 percent of women availed antenatal care services in government facility proving the significant role of ASHA in motivating pregnant woman for utilisation of antenatal care from public health care facilities. 56 percent of couples reported use of contraception of which 88 percent availed from government health counters.

ASHA has also played an important role in educating patients from the households visited by them to go for treatment of chronic diseases in public health institutions instead of private health facilities. Evaluation study has also pointed out the need to improve payment of compensation to ASHAs and also to provide advance money for emergency transport.

The new initiatives are:- Establishing an ASHA database in all states; Introducing a system for outcome monitoring; Introducing handbook for ASHA facilitators; and Setting up ASHA grievance redressal mechanism.

In a separate evaluation study in Madhya Pradesh, Uttar Pradesh and Uttarakhand it has been pointed out that there is a great urgency to speed up establishment of support structures and

implementation of the programme. All these states will benefit a great deal while having a skilled ASHA at the community level to promote maternal new-born and child health and family planning.

⇒ **DISASTER MANAGEMENT UNDER DECENTRALISED GOVERNANCE**

Disasters are common throughout the world. India is also vulnerable to a number of natural, as well as, man-made disaster on account of its unique-climate and socio-economic conditions. It IS highly vulnerable to floods, droughts, cyclones, earthquakes, landslides, avalanches and forest fires. Out of 35 States and UTs in the country, 27 (77%) are disaster prone. Almost 59 per cent of the landmass is prone to earthquakes from moderate to very high intensity; over 40 million hectares (12 per cent of land) are prone to floods and river erosion. Of the 7,516 km long coastline, close to 5,700 km is prone to cyclones and tsunamis; 68 per cent of the cultivable area is vulnerable to drought and hilly areas are at risk from landslides and avalanches.

No doubt, there is institutional arrangement for disaster management provided by the Disaster Management Act, 2005(hereafter referred to DMA) which gave the constitutional sanction to constitute National Disaster Management Authority (NDMA) under the chairmanship of Prime Minister. Similarly, State Disaster Management Authorities in the State/UTs under the chairmanship of Chief Minister or Lt Governor or Administrator and District Disaster Management Authority under the chairmanship of District Magistrate in each District are constituted. DMA also seeks to constitute Disaster Response Fund & Disaster Mitigation Fund at the national, state and district levels. This shows the existence of elaborate arrangement for disaster management.

However, challenge before us is to ensure the role of local democratic institutions like panchayats and municipalities in disaster management. This paper argues that the sustainable solution of the disaster to a great extent depends on integrating the risk management planning into the development planning of the country with the participation of vulnerable groups emerging from the grassroots. How can Panchayats and Municipalities perform this task is discussed here?

Desired Role of Panchayats in Disaster Management Act, 2005

The local governing institutions (i.e. Panchayats and Municipalities) are so marginalised that they have been reduced to 'local authority' from institutions of self - government. The expression "local authority" in the Chapter IV of the Disaster Management Act(DMA) shows that no thought was given to the 73rd and 74th amendments while piloting this Bill. The Articles 243G of the 73rd Amendment Act and 243W of the 74th Amendment Act have not only made these bodies as institutions of self government, but also made them democratically elected bodies. Local authorities are those bodies which are dominated by nominated civil servants and not by community. On the other hand, Panchayats and Municipalities are elected bodies by local community and answerable to local community through the institution of Gram Sabha (village Assembly or equivalent body in urban areas) comprising all voters.

Hence, in the light of elevated role given by the constitution to these institutions, these bodies are to be designated as institutions of self government. It is surprising to note that the 73'd and 74th Amendments to the Constitution were enacted more than a decade before the DMA came into existence even then the provisions of these Acts have not been reflected in the DMA. There are ample evidences to show that local self-governing institutions have played critical roles in the tsunami affected Tamil Nadu and Kerala, cyclone- ravaged Orissa, flood affected Bihar and earthquake affected Gujarat.

Further, the Chapter IV of the DMA refers to formation of District Disaster Management Authority (DDMA). Zila Parishad Chairperson will be the co-chairperson of DDMA while the Collector, District Magistrate or Deputy Commissioner shall be the chairperson of this body. While Prime Minister and Chief Minister chair the National and State level Disaster Management Authorities respectively. Taking the same principle chairperson of the Zila Parishad should head the district level disaster management authority because they are also elected by people and have organic linkages with elected representatives of Block and Gram Panchayat bodies as well as with villagers.

Participation of Vulnerable Groups in the Disaster Management through Panchayats

If we see the outcome of disasters, we find that economically and socially deprived segment of the population namely, women, Scheduled Castes, Scheduled Tribes, suffer the most. Hence, it would be desirable if these sections of the community are involved in the decision making of various activities both in pre-disaster phase comprising prevention, mitigation and preparedness and post-disaster phase comprising response, rehabilitation, reconstruction and recovery. Panchayats and municipalities provide adequate space to these segment of society in disaster management. Here, numbers of elected representatives of SCs, STs and women have been given to show the strength of these sections in local bodies. Panchayati Raj system has three tier structure namely Gram Panchayat at lowest level, Panchayat Samiti at intermediate level and Zila Panchayat at district level. The space provided to SC, ST and women is shown in the table given below:

It may be seen from table-1 that adequate space have been provided to these segment of society under local self- governance system in the country. For example, at Gram Panchayat level, out of total elected representatives more than 5

lakh are from SC category, more than 3 lakhs from ST category and about 10 lakh are women. At Block level, 32779 from SC category, 11510 from 5T category and 58112 are women. At District level, 2699 are from DC category, 1691 from ST category and 5763 are women. Putting all category together, about 5.5 lakh are from SC category, 3.35 lakh from DT category and 10.48 lakh are women working as Panchayat leaders at different levels of the Panchayati Raj system in the country.

This is the level of participation of vulnerable section of rural community in rural governance. Their share in the Municipalities is in addition to that mentioned above. Representatives of these categories also hold the offices of the chairpersons and vice-chairpersons in these bodies. Thus, elected representatives of these categories will take care of marginalized groups and also the entire community in pre-disaster phase comprising prevention, mitigation and preparedness and post-disaster phase comprising response, rehabilitation, reconstruction and recovery.

Shift from Relief-centric Approach to Development oriented Plan under Panchayati Raj System

In order to solve the problem of risk management on sustainable basis the relief - centric approach of Disaster Management has to be integrated into development planning of the country. The Panchayati Raj Institutions provide institutional arrangement for solving at least manmade disasters on continuous basis. Article 243 G of the Constitution says that Panchayats prepare plan for economic development and social justice and while doing so they may also take into account the 29 subjects listed in the 11th Schedule of the Constitution. This list contains varieties of subjects such as agriculture, animal husbandry, construction of roads, implementation of poverty alleviation and rural development programmes, education including technical education, welfare

of women, children and weaker section including disabled, public distribution and maintenance of community assets. In urban area, Panchayats' counterparts Nagarpalikas as per Article 243W of the Constitution also prepare plan for economic development and social justice including 18 subjects listed in the 12th Schedule of the Constitution. This list, among others, contains subjects of urban planning, fire service, welfare of weaker sections, sanitation, urban forestry, urban amenities, etc.

Further, Article 243ZD of the Constitution says that there shall be constituted a District Planning Committee at the district level in every state to consolidate the plans prepared by the Panchayats and the Municipalities in the district and to prepare a draft development plan for the district as a whole. In the composition of the Committee, not less than four-fifths of the total number of members of such Committee shall be elected representatives of Panchayats and Municipalities.

Every District Planning Committee (DPC)while preparing the draft development plan also take into account of common interest between the Panchayats and the Municipalities including spatial planning, sharing of water and other physical and natural resources, the integrated development of infrastructure and environmental conservation. It will also look into the extent of financial or otherwise resources available.

It is clear from above discussion that Panchayats in rural area, Municipalities in urban area will prepare plans for economic development and social justice and the plan so prepared shall be consolidated at district level by DPC taking into account, among others, environments issues. Hence, the Panchayats and municipalities and DPC should have been given principal role in pre and post disaster management activities. It was expected that in view of the reality of the situation, these bodies will be empowered to do the activities which integrate relief to development planning these institutions are expected to prepare at their respective levels.

Besides, Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) has made Panchayats principal authorities for planning and implementation of its activities. Permissible activities under the Act are to be decided on participatory bottom-up planning by Panchayats which is an additional avenue for mainstreaming disaster risk reduction into development planning. Under the Act permissible activities are aimed at conservation and preservation of water and land resources, which are very relevant in averting disaster management in a practical way. Panchayati Raj Institutions and Gram Sabha also provide ideal platforms for convergence which seek to efficiently utilize, manage and conserve natural resources including soil and water at local level on sustained basis.

No doubt, for carrying out such a task, the capacity building of these institutions has to be enhanced both at institutional level in terms of infrastructural accessibility like Panchyats offices, availability of personnel & accessibility of technology and at operational like building their capacity as how to blend disaster plan with development plan of the village, block district levels. Role of the National Institute of Disaster Management is crucial in this regard.

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Gist of

Press Information Bureau

⇒ **National Food Security Mission Strategies Being Fine-Tuned to Achieve Higher Targets in 12th Plan**

Shri Pawar Calls for Greater Research Paertnerships, Technologies to Mitigate Impact of Climate Change

The strategies adopted by the National Food Security Mission (NFSM) for increasing productivity and production of major crops are being further fine-tuned so that the momentum gained by the Mission in the 11th Plan is used for achieving 25 million tonne per year additional foodgrain production by 2017.

Addressing the General Council Meeting of NFSM here today, Agriculture and Food Processing Industries Minister, Shri Sharad Pawar proposed that new partnerships be forged with research organizations and innovative approaches adopted for developing effective technologies. He also appreciated the role being played by international research organizations, besides ICAR institutes and universities, in supporting various technology initiatives under the Mission.

Shri Pawar recalled the monsoon situation in many parts of the country last year and its impact on agriculture. Though farm technologies developed by ICAR and other research organizations have to some extent are mitigating the impact of changing climatic factors, the efforts need to be accelerated 'to develop more effective ways to address various abiotic and biotic stresses faced by crops', he said.

This was the 9th Meeting of the General Council of NFSM. The Council is the apex policy making body of NFSM. It is chaired by Agriculture Minister and has representatives from various Departments and research organizations.

In the 11th Plan, NFSM exceeded its target of adding 20 million tonne foodgrain production per year in 2011-12, a year before the target date. In the first year of the current Plan, i.e. 2012-13, as against the target of producing additional 2 MT rice, 1 MT wheat and 1.25 MT pulses, NFSM has achieved significantly higher production - 7 MT rice, 9 MT wheat and 2.5 MT pulses.

Since the Mission seeks to improve productivity of crops in districts with low productivity, an exercise is being undertaken to include new districts in which productivity has remained lower than the national and states averages. Simultaneously, districts that have attained higher than average productivity will be taken out of the purview of NFSM.

-2- As the strategies adopted by NFSM proved successful in the 11th Plan, coarse cereals and fodder crops have been brought under it in the 12th Plan (besides rice, wheat and pulses which were the crops under NFSM in the 11th Plan).

In 2012-13, Rs. 1566.48 crore was spent under NFSM. As much as Rs. 651.16 crore out of this went for promoting pulses crops. In the current year (2013-14), Rs 2254 crore has been allocated to the scheme.

⇒ **TAGORE AWARD FOR CULTURAL HARMONY, 2013 TO BE CONFERRED ON ZUBIN MEHTA**

Tagore Award for Cultural Harmony, 2013 is being conferred on the noted Maestro, Zubin Mehta.

A High-level Jury under the Chairmanship of Prime Minister, Dr. Manmohan Singh and comprising the Chief Justice of India, Justice Altamas Kabir, Leader of Opposition in Lok Sabha, Smt. Sushma Swaraj and Shri Gopalkrishna Gandhi after detailed discussions on 4th July, 2013, unanimously decided to select Shri Zubin Mehta to be the second recipient of the Tagore Award, 2013 in recognition of his outstanding contribution to cultural harmony.

The annual award was instituted by the Govt. of India during the commemoration of 150th Birth Anniversary of Gurudev Rabindranath Tagore. The first Tagore Award was conferred on Pt. Ravi Shankar, the Indian Sitar Maestro in 2012.

The award carries an amount of Rs. 1 crore, a citation in a scroll, a plaque as well as an exquisite traditional handicraft/handloom item. The award is open to all persons regardless of nationality, race, language, caste, creed or sex.

Setting up of
National Aviation University in India

The Union Cabinet today gave its approval to the proposal for setting up of a National Aviation University (NAU) in the name of Rajiv Gandhi National Aviation University at the District of Rae Bareli in the State of U.P. as a Central University.

The Cabinet also approved the proposal to introduce the Rajiv Gandhi National Aviation University Bill, 2013 in the Parliament; to create a post of Vice Chancellor (with pay scales on the pattern of Central Universities) by selection through a Search and Selection Committee headed by Cabinet Secretary with members representing Ministries of Civil Aviation,

Personnel & Training and Human Resource Development and for creation of a temporary post in the grade of Joint secretary to Government of India for the position of Project Director which would be filled up on deputation basis.

The 'Rajiv Gandhi National Aviation University' will be established as a Central University and as an autonomous body under the administrative control of Ministry of Civil Aviation in Rae Bareli District of U.P. with an estimated Central Government's funding of Rs. 202 crore in Phase-l (2013-14 to 2018-19) on the land available with Indira Gandhi Rashtriya Udan Academy (IGRUA), a Society set up as an autonomous body under Ministry of Civil Aviation) in Rae Bareli District of U.P. About 26.35 acres of land available with IGRUA has been identified for setting up of NAU in its first phase.

A skilled and competent workforce is essential to create a safe and efficient aviation industry. Despite existence of a large number of private institutions in India that provide aviation education and training, there is general consensus amongst stakeholders that the number of programmes offered, depth of course content and infrastructure facilities available with them are not sufficient to meet the industry requirements. It is therefore, necessary to establish National Aviation University to cater to the growing educational and training requirements of the civil aviation sector.

The National Aviation University aims to facilitate and promote aviation studies, teaching, training and research with focus on emerging areas of studies such as aviation management, aviation regulation and policy, aviation history, aviation science and engineering, aviation law, aviation safety and security, aviation medicine, search and rescue, transportation of dangerous goods, environmental studies and other related fields, and also to achieve excellence in these and connected fields in emerging areas and such areas as may emerge in future. The University will

also be a knowledge partner to safety and security regulators by providing required academic inputs to help them execute their enforcement responsibility better.

Background

In 2006, the Kaw Committee had recommended setting up of a National Aviation University in India. The 12th Five Year Plan Document has also made a similar recommendation to augment qualified and trained manpower for aviation sector in India. Based on a Detailed Project Report submitted by Ministry of Civil Aviation, the Planning Commission granted "In Principle Approval" for setting up of National Aviation University in India.

Approval of the Plan scheme 'Development Communication and Information Dissemination' for the 12th Five Year Plan (2012-17)

The Cabinet Committee on Economic Affairs has approved the proposal of the Ministry of Information and Broadcasting for implementing the Plan Scheme "Development Communication and Information Dissemination"

during the 12th Plan period with an outlay of Rs.630 crore.

The Plan scheme envisages making the common person aware of the benefits envisaged in various Government schemes so that the benefit of these schemes is realized to the maximum possible extent. The scheme will be implemented by the media units of the Ministry of Information and Broadcasting, through various modes of awareness generation such as; outdoor publicity, electronic and print media, Public Information Campaigns, press tours, conducted tours, people to people contact, special outreach programmes, live art and culture shows, the new media etc.

The Government of India has launched many welfare and employment generation schemes for the people in general and for the disadvantaged sections in particular by creating entitlements backed by legal guarantees for an individual's rights. The main objective of the Government under these schemes is all round development of the people. The success of all government sponsored flagship schemes depends largely on awareness about these schemes and the benefits likely to accrue to targeted beneficiaries.
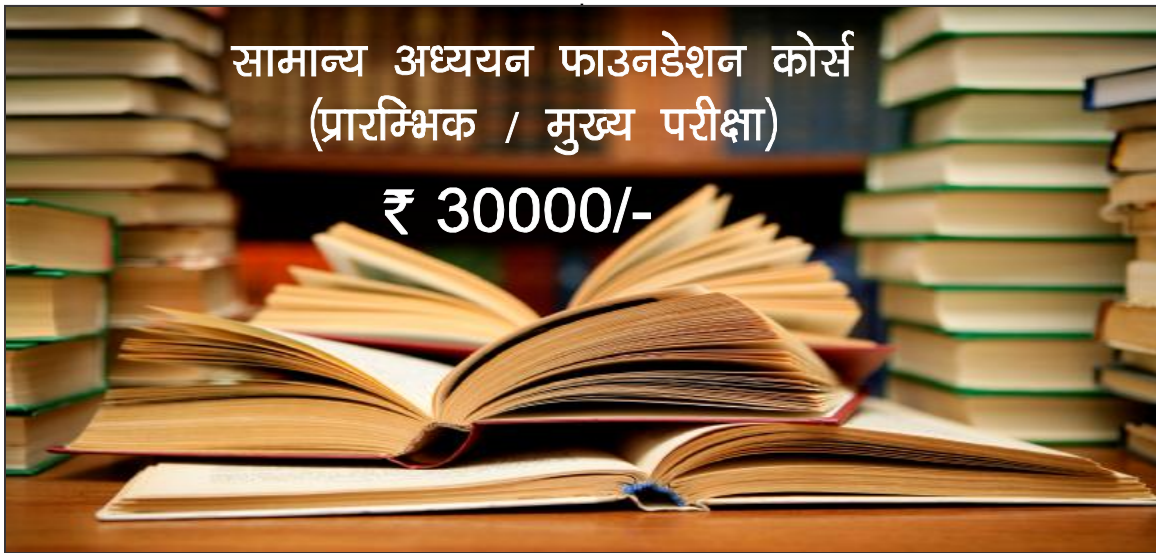
Gist of SCIENCE REPORTER

⇒ How Cloud Seeding Works

Schoaefer published an article on these experiments in the 1 5 November 1946 issue of *Science* magazine with the statement: "It is planned to attempt in the near future a large scale conversion of super cooled clouds in the atmosphere to ice crystal clouds, by scattering small fragments of dry ice into the cloud from a plane,"

In November 1946, Dr. Bernard Vonnegut discovered that microscopic crystals of Silver Iodide (Agl) - commonly used in silver-based photography - nucleate water vapour to form ice crystals, Vonnegut chose silver iodide crystals because there is nearly the same distance between molecules in the crystal lattice for both ice and Agl, making Agl the optimum material to nucleate ice,

Vonnegut also invented a practical way of generating tiny silver iodide particles to serve as nuclei for ice crystals, He dissolved a mixture of Agl and another iodide in acetone, sprayed the solution through a nozzle to make droplets, and then burned the droplets, In this way, one gram of Silver Iodide can produce 1016 nuclei for ice crystals, Till now, Vonnegut's method continues to be the most common way to seed clouds,

Apart from dry ice (solid carbon dioxide), liquid propane and recently hygroscopic materials such as salt are also being used, Liquid propane can produce ice crystals at higher temperatures than silver iodide.

Some of the popular applications of artificial weather modification have been cloud seeding to increase the rain or snow fall and hurricane seeding to mitigate its effects or turning its course, The methods to achieve these have been developed over the years and researchers continue to look for more efficient and reliable methods to perform these phenomenon,

One of the main Challenges in performing weather modifications is to minimize any long-term effects on the global climate, The scientific community has long sought safer ways to achieve weather modification successfully and with minimal uncertainty.

Seeding Clouds

Cloud seeding only works to the extent that there is already water vapour present in the air. It has been used in several countries including United States of America, China, India and Russia,

The release of silver iodide into an existing super-cooled cloud (i.e., air temperature between -39 and ·5 Celsius) can convert water vapour to ice crystals, which is called sublimation, The ice crystals nucleated by the silver iodide will grow, and local water droplets will shrink, The latent heat released by converting water vapour to ice will increase vertical air motion inside the cloud and aid the convective growth of the cloud. Raindrops or snowflakes will grow larger by falling through a taller cloud. Also, moist air from evaporated moisture in the soil will be sucked into the base of the cloud by convection, thus increasing the total amount of water in the cloud.

About thirty minutes after the silver iodide release, snow may fall below the cloud. Depending on the temperature and humidity below the cloud, the snow may Change to rain, or even evaporate, before reaching the ground.

Silver Iodide is the most common ice nucleus used in cloud seeding, but it is not the only material used. Dry ice was widely used in experiments in the USA in the 1950s and early 60s. Substances with temperatures less than -40 Celsius (e.g., solid carbon dioxide pellets, liquid carbon dioxide, liquid propane, liquid nitrogen, etc.) can be dropped from airplanes into the tops of clouds to induce formation of ice crystals. Commonly, cloud seeding is performed over cumulus clouds that are generally responsible for producing rain.

At the time of this discovery, Dr. Vonnegut worked in the research laboratory at General Electric Company in Schenectady, New York, which funded the initial work on cloud seeding. General Electric rented an airplane and released dry ice into clouds on four days during November and December 1946. The last day of seeding coincided with the heaviest snowfall of the winter in the upstate New York area, which made the company management concerned about the possibility of cloud seeding experiments causing harmful weather.

Later, a General Electric and U.S. government research project released silver iodide and dry ice in the vicinity of Albuquerque, New Mexico in 1948 and 1949. Dr. Langmuir claimed that his release caused rain all over the state of New Mexico. Langmuir'S group continued to release silver iodide in New Mexico between November 1949 and July 1951. He claimed that the release of silver iodide modified the weather, not only in the state of New Mexico but also more than thousand kilometres downwind. It is hard to make precise causal claims on the reasons behind the weather at a large scale like this one, and hence Langmuir's claim was rejected by the meteorological community.

The release of silver iodide was discontinued in July 1951 after the great floods in Kansas and adjacent states. It was one of the most devastating floods in the area killing seventeen people, despite weather forecasts and warnings. The current consensus of meteorologists seems to be that the release of silver iodide in New Mexico probably had no effect on the rainfall in Kansas. If there was an effect, the effect would only be a small enhancement of the total rainfall.

A cloud seeding operation known as Project Cumulus was conducted by the United Kingdom between 1949 and 1952. On 16 August 1952, a severe flood occurred in the town of Lynmouth located in north Devon, England. Salt was used for seeding a few days before this disaster. Speculation was rife that the cloud seeding operation resulted in the Lynmouth disaster, although it could not be proved.

Often in Southeast Asia, open burning produces haze that pollutes the environment. Cloud-seeding has been used to improve the air quality by encouraging rainfall. In India also the Tamil Nadu government conducted cloud seeding operations during the years 1983, 1984-87, 1993-94 when it faced severe drought conditions. In the years 2003 and 2004 the Karnataka government initiated cloud seeding.

USA conducted a cloud seeding operation called Operation Popeye between 1967 and 1972 during the Vietnam War to extend the monsoon season over Laos. This was aimed to increase rainfall and hence obstruct the enemy military truck supply. Eventually, resolutions in favour of banning environmental warfare were passed in 1977.

More recently, in January 2011, several newspapers and magazines reported that scientists backed by the government of Abu Dhabi had created over fifty artificial rainstorms between July and August 2010 near AI Ain, a city that lies close to the country's border with Oman and is the second-largest city in the Abu Dhabi

Emirate. The artificial rainstorms were said to have sometimes caused hail, gales and thunderstorms, baffling local residents. The scientists reportedly used ionizers to create the rainstorms, and although the results are disputed, the large number of times it is recorded to have rained right after the ionizers were switched on during a usually dry season is supportive evidence. There have been ongoing cloud seeding activities in different parts of the world for different applications. Several western USA states use cloud seeding to enhance snowfall and supplement natural supply of water.

Different techniques have been used over the years for seeding of clouds.

- **Aerial Cloud Seeding:** Seeding clouds using airplanes.
- **Ground-Based Cloud Seeding:** Seeding clouds by using generators, canisters fired from anti-aircraft guns or rockets.
- **Electronic Seeding:** Recently an electronic mechanism was tested in 2010, when infrared laser pulses were directed to the air above Berlin by researchers from the University of Geneva.
- **Bio-precipitation:** This method, proposed around 1983, uses rain-producing bacteria to enhance rainfall. The biological ice nuclei are capable of catalyzing freezing at much warmer temperatures. The ice-nucleating bacteria currently known are mostly plant pathogens. Many ski resorts use a commercially available freeze-dried preparation of ice-nucleating bacteria to produce snow as required.
- **Hurricane Seeding:** Similar to cloud seeding, hurricane seeding has also been tested to mitigate the effect of hurricanes developing in the ocean by reducing their intensity or by changing their direction.

Seeding Hurricanes

On 13 October 1947, as part of Project Cirrus the USA dropped 80 kilogrammes of dry ice into a hurricane in the Atlantic Ocean. The hurricane changed direction and traveled inland, where it did extensive damage to property in the state of Georgia. It was widely believed that the hurricane's change of direction was the result of the cloud seeding. Subsequent analysis of the data by meteorologists showed that this hurricane had already begun to change its direction when the seeding was done. About a decade later. scientist Dr. Mook recognized that the storm's sudden change in direction was not caused by the seeding, but rather the upper level steering winds in the vicinity of the hurricane.

In the early 1960s, Dr. Robert Simpson of the National Hurricane Research Labs in Miami, Florida, theorized that hurricanes could be weakened by releasing frozen nuclei or particles of silver iodide compound into the wall clouds of a hurricane or tropical storm, and cause imbalance of the forces within the storm system. Simultaneously, a group at the Navy Weapons Center in California improved seeding technology by developing new seeding generators that would be able to release large amounts of crystals into tropical storms and hurricanes. These findings and discoveries led to the birth of Project Stormfury in 1962. The team was able to decrease the sustained winds in the storm by ten percent.

After the creation of Project Storm fury, the team put together new ideas on how to aftack a hurricane. They proposed that a hurricane could be weakened by converting the super-cooled water within the deep clouds of the storm to ice; the hurricane's vertical column of air would be warmed thus weakening the storm. The team did not have many opportunities to work on this new idea over the next eight years as there were not any storms that were far enough from land. They did not want to risk the lives of people in case they could not reduce the hurricane intensity (or end up worsening it).

In 1963, tests were conducted on Hurricane

Beulah, a major hurricane in the Atlantic Ocean, but with only marginal success. At least 688 people were killed in its path.

Then, in 1965, the team considered seeding Hurricane Betsy, a tropical cyclone in Atlantic basin, but due to the close proximity to Puerto Rico and other Caribbean islands, and the storm's erratic motion, the team did not go through with this idea. Betsy caused damage to property worth more than one billion dollars and around hundred casualties.

Finally in 1969, Project Stormfury had a significant test case when Hurricane Camille emerged in the 1969 Atlantic hurricane season. Camille accelerated northeastward, attaining peak winds of 70 mph [11 5km/hr] as it interacted with another larger Hurricane Debbie to its southeast. Hurricane Debby was seeded on a couple of occasions over the two day period of August 19 and August 20, 1969. Each time Pouring liquid nitrogen onto the sea to the storm was seeded, sustained winds were deprive the hurricane of heat energy reduced significantly. The first time, winds dropped 31% while the second time, they Creating soot to absorb sunlight and only dropped 15%.

HOW DO BEES HEAT THEIR HOMES?

You can keep away the extreme cold of winters by treating yourself to a cup of hot tea or coffee or wrapping yourself in blankets and sitting by the fire. But how does the honey bee keep its hive warm?

As cold blooded animals, bees cannot control their body temperature. Yet they have to maintain the temperature of the body to keep up their duties like flying, foraging and caring for their young. The survival capability of honeybee colonies throughout the severe winter months depends on the population of workers and whether the hive is adequately provisioned with food.

A honeybee colony with a population of worker bees can regulate the interior temperature of the hive, particularly within the area surrounding the developing brood (immature stages like eggs, larvae and pupal stages). Normally the brood-nest temperature is stabilised between 33°C and 36°C. The temperature averages about 34.5°C and usually alters by less than 1°C across the day. Below about 10·C bees become immobilised, entering a sort· of coma. Survival depends on the duration of this coma.

Honey bees employ certain methods of retaining the heat. The first is the selection of the nest site which compactly encloses the colonies' combs and bee population. Bees usually avoid cavities with slits larger than about 60 cm2. By using sticky plant gums and resins the bees also reduce the hive entrance for the period of winter and also put down the lids over needless holes. The worker bees eat more food (mainly honey) to bear the cold climate. The fast rate of food metabolism keeps them warm.

Anothermechanism against cold is clustering. The bees trim down heat losses by gathering together. The compactness of the cluster is inversely proportional to the ambient temperature. The contraction of the flight muscles located in the thorax region also imparts some amount of heat production.

A winter cluster can be arranged on both sides of the sheets of honeycomb. Clusters commence to form when the interior temperature falls up to l8°C. The comb cells, especially at the core of the cluster, hold a queen bee and little amount of brood (eggs, larval and pupal stages). The temperature of the central area is maintained by the layers of worker bees. It has been observed by researchers that if a bee colony is killed in winters with hydrogen cyanide gas and the dead cluster is dissected, two parts of the interior organisation are clearly visible.

The first part in the thick outer layer is where the bees compactly held together, positioning themselves with their heads in the direction of the centre of the cluster. The inner layer is loose where bees are free to be in motion and carry out the regular everyday jobs of brood rearing and caring for the queen, cleaning, etc.

Clustering minimizes the pore spaces in between bees which helps to reduce heat loss and also reduces

the surface area for heat exchange. However, it is not completely understood how the outside chilled bees get pushed towards the middle of the cluster and replaced by warm bees.

Bees warm the cluster by creating vibrations in their flight muscles. The temperature in the "bee nursery" is further regulated by the spreading out or tightening of the cluster with rise and fall of temperature respectively. Clustered bees must maintain a constant provision of food. The cluster moves towards the stock of honey at a snail's pace. If there is not enough storage of honey, the bees can quickly be malnourished and starved. Pathetic bee colonies having a small population.

⇒ **Naitonal Biodiversity Information Outlook**

Biodiversity, or biological diversity, comprising the variety of all life forms on, is essential for our existence. It is a simple concept, but its conservation is a complex issue involving multiple stakeholders across a number of natural resource management and environmental sectors. However, recent concerns on biodiversity loss and reporting requirements of international biodiversity agreements have called the world's attention to inventorying and monitoring of the wealth of biodiversity.

India, a mega-diverse country, is internationally recognised for its biodiversity, much of which occurs nowhere else in the world. Not only it is estimated to possess 7-8"10 of the globally documented species (NBA Annual Report 2009-2010), but also has a rich assemblage of traditional and indigenous knowledge, both oral and documented. Its conservation, therefore, is sought through a raft of national, state, territory and, increasingly, industry policies and strategies.

There has been a significant change in the geographical ranges and species composition of India's flora and fauna, ecosystems over the last 100 years. The decline in biodiversity is due to themumtude of actions taken daily by individual land managers, industries, communities and governments contributing to the loss of native species and their habitat, reducing soil condition and water quality, and modifying ecosystems so that they no longer function as they should. Many of these actions are taken without any real understanding of the long-term environmental costs.

Although it is recognized that the economic progress and health of ecosystems and biodiversity are inextricably linked, the economic forces themselves have become a foremost reason for biodiversity loss in recent times. If mismanaged, it will become impossible to regenerate and replicate these natural resources and ecosystems that harbour unique and varied biodiversity.

The scope of biodiversity data has been expanding beyond classical "conservation" or "biological" data. It is, therefore, essential that we develop an informatics supported mechanism to efficiently manage and use these natural resources. Creating easy and quick access to biodiversity data would allow efficient sustainable conservation and help in making informed decisions.

Biodiversity Informatics

Swift progression in the spheres of computer science and information technologies has allowed integration of biodiversity information and analytical facilities to collaborate on social networks, leading to the emergence of a new discipline, 'Biodiversity Informatics'. The discipline is critical to a wide range of scientific, educational, and governmental uses, and is essential to decision-making in many realms.

Initiatives to integrate data into viable resources for innovation and decision-making are being developed as local, regional, and global initiatives. A formidable challenge is integration of these initiatives into an organized, well-resourced, global approach to build and manage biodiversity information resources through collaborative efforts.

Connecting technology for aggregating, storing, querying and examining biodiversity data has seen major developments over the last decade.

There have been a plethora of biodiversity information resources that include mailing lists and discussion groups, occurrence records, geographical databases, biodiversity image libraries, institutional databases, species description pages, specimen records of herbaria and museum databases, and biodiversity focused Internet sites.

The challenges on the biodiversity informatics landscape are on two fronts: systematic web framework to link these biodiversity information islands, and efficient and flexible data exchange standards for seamless information sharing among these sites.

The success of several concerted national and international efforts depends largely on broad deployment of biodiversity informatics information and products that help in the integration, analysis and visualization of biodiversity data, and can lead to development of a new field of research for conserving biodiversity. To achieve concrete results, several global and regional efforts are aiming at organizing data stakeholders and making data available for conservation and sustainable development research.

The latest trend, especially after the ratification of the Convention on Biological Diversity (CBD), is to embrace resource utilization and socio-economic data as well. The United Nations Environment Programme (UNEP) outlines eight major categories of biodiversity data for country studies (UNER 1993). These datasets will serve three main objectives of CBD namely, the conservation of biodiversity, the sustainable use of biological resources and the equitable sharing of the benefits from using those resources.

Extensive and accessible data sets are needed that contain relevant and reliable information on ecosystems, species, and genetic resources. Such data could pertain to information on socio-economic attributes such as population; population distribution and transport routes; value of biodiversity that takes into account the cost and benefits of management options; and information on both potential and actual threats to biological diversity. It will also give information on current and past management activities particularly the use of biological resources and on information models, standards and technologies, and appropriate agencies or experts who can be contacted.

National Biodiversity Information Outlook

Over recent decades, all levels of government have been working to prevent the loss of native species and their habitats. Available evidence suggests there is a continuing decline in biodiversity. Species extinctions, secondary salinisation, soil decline, pest outbreaks, and declining native vegetation and water quality and quantity are among a range of symptoms of ecosystems losing the capacity to repair themselves.

At the same time, Indians are recognising the environmental, economic and social values of biodiversity and ecosystem services. The time is right for governments to review progress, policy directions and delivery mechanisms to focus investment and effort according to clear priorities addressing the underlying causes of biodiversity decline.

The Ministry of Environment and Forests (MoEF) is the primary agency responsible for conserving biodiversity in India. However, it faces increasing difficulty in performing this task, as the number of threatened species continues to grow. Therefore, the MoEF and the National Biodiversity Authority in consultation with the Wildlife Institute of India and GBIF India node has come out with the National Biodiversity Information Outlook (NBIO). NBIO is a new approach to addressing biodiversity

conservation in a rapidly Changing world and is based on the application of the science of bio-informatics.

NBIO is a national policy instrument, which will assist in prioritizing acquisition, discovery and publishing of biodiversity information by relevant stakeholders/players and to communicate progress and advocate needs to decision-makers in the form of a National Biodiversity Informatics Roadmap during the United Nations Decade of Biodiversity.

The Convention on Biological Diversity-Conference of Parties (CBD COP- 11) held in Hyderabad in October 2012 released the National Biodiversity Information Outlook. With this strategy, India seeks to address challenges facing biodiversity conservation on a national basis. The release of the NBIO Draft is one of a number of recent positive steps by the Indian Government to address those areas in the States with high biodiversity value and provide access to biodiversity data and information, long term strategy and action plan together with national biodiversity information infrastructure.

A wide-ranging review of past biodiversity conservation programmes was undertaken by the MoEF and the National Biodiversity Authority in consultation with the GBIF to understand specific attributes of the national vision document. Based on this review, the main challenges to achieving most effective delivery of outcomes to address biodiversity decline are considered to be defining clear programme objectives and purpose, and improving programme design. The Working Group also identified key elements of the most effective approaches for delivery, management interventions and approaches. They reviewed key threats to biodiversity, the outcomes sought and the most effective interventions to address these threats. Outcomes and strategies were identified that would benefit from a national approach.

The approach identifies the highest priority actions, actions that maintain natural systems, actions that advance ecologically sustainable natural resource management, actions that will improve institutional frameworks for delivery, and actions that will embed biodiversity conservation into the economic and social fabric of India. The focus will be on:

- Drivers of loss of habitat values and decline in ecosystem function;
- More effective management that will reverse the decline in extent and condition of populations and habitat of species and communities;
- A national network of continental scale ecological linkages;
- Engagement of the full capacity of governments, landholders, industries, non government organisations and communities to conserve India's biodiversity assets;
- Setting up of institutional and governance arrangements that clarity roles and responsibilities and ensure integrated outcomes, including promotion of joint ownership of the problems and solutions;
- Effective market-based mechanisms to deliver biodiversity conservation; and
- Continued investment in knowledge creation and social and institutional capacity for effective conservation of biodiversity.

NBIO –
Interpreting Biodiversity Knowledge

Sharing knowledge, collectively: There are significant gaps in our current knowledge of biodiversity and incomplete data coverage for many parts of India. There is also much we still need to understand about how the many animals, plants and microorganisms contribute to broader ecological functions and to the health of the environment and the community.

Ensuring knowledge is interpreted for a wide audience, communicated clearly, and made

accessible will improve planning and drive greater communication between researchers, policy makers and on-ground biodiversity managers. We also need to improve the alignment of applied research with priorities for biodiversity conservation so that new knowledge can be used to adapt management accordingly.

Delivering conservation programmes efficiently: Delivering conservation initiatives efficiently is vital to ensure that our efforts and investments produce the greatest long-term benefits for biodiversity. Aligning biodiversity conservation activities across India with the Strategy will ensure activities are prioritised, targeted and designed to deliver real conservation benefits. Consistent approaches to biodiversity conservation, including through legislative and policy review and reform, will also help to ensure conservation initiatives are delivered more efficiently. Application of robust national monitoring, reporting and evaluation system concerning biodiversity: Implementing robust national monitoring, reporting and evaluation of the state of biodiversity and the success of conservation actions is crucial in ensuring that our efforts are really making a difference to biodiversity. Monitoring changes to biodiversity and the environment over time will also help us to understand how to intervene to build broader landscape resilience. Adaptive management approaches are a particularly important part of how we respond to climate change, as the impacts on and consequences for biodiversity are progressively understood.

Roundtableon Advancing Biodiversity Informatics for Sustainable Development

The Ministry of Environment & Forests (MoEF) and the Wildlife Institute of India (WII) organised a Roundtable on Advancing Biodiversity Informatics for Sustainable Development on 15 March 2013 at the India International Centre, New Delhi, on the occasion of the visit of a delegation from Global Biodiversity Information Facility (GBIF).

Nineteen participants from ten organizations participated from across the country in this event.

In the technical session, Dr. V.B. Mathur, Dean, WII, made a presentation on 'National Biodiversity Information Outlook (NBIO)' which was followed by presentation by Dr. Donald Hobern, Director, GBIF, on 'Global Advances in Biodiversity Informatics'. Dr. Vishwas Chovan, GBIF made a presentation on 'Changing Paradigm in Biodiversity Data Publishing'.
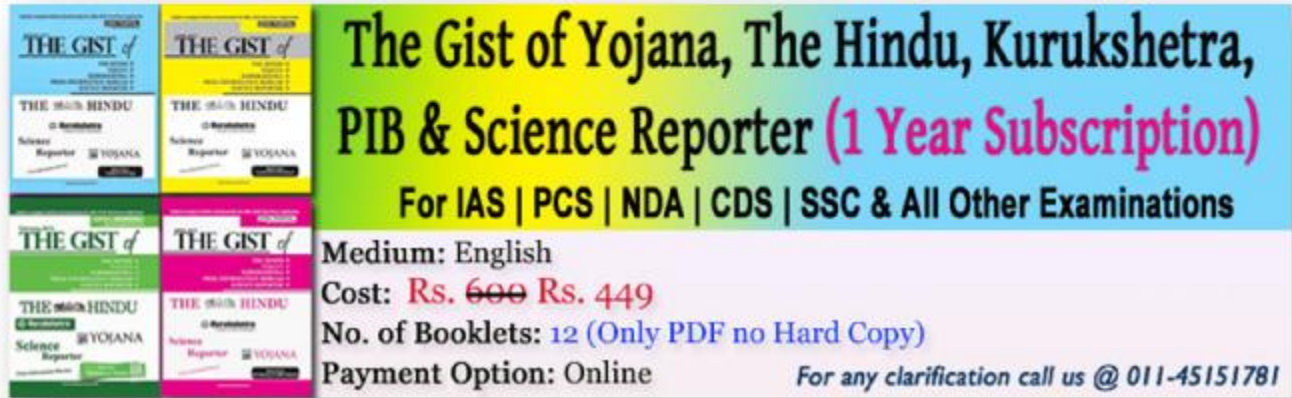
Based on the deliberations during the Round Table, the following points emerged:

i. The establishment of Indian Biodiversity Information Facility (InBIF) may be expedited.

ii. Efforts may be made to set up on priority a national repository on metadata pertaining to biodiversity and bioresources.

iii. Targeted efforts may be made for strengthening 'Taxonomic Informatics'

iv. A multi-tiered approach to capacity building in the field of 'biodiversity informatics' may be adopted with active involvement of scientific institutions, universities and civil society organizations.

v. Public-funded institutions may provide access and contribute to the development of biodiversity databases, which should be made inter-operable, as envisaged under InBIF project.

v. 'Barrier' to data sharing both 'real' and 'imagined' may be addressed using appropriate technical tools and through awareness generation.

vi. Short-term courses on 'Biodiversity Informatics' may be offered by select Universities/Institutions to create a pool of 'Biodiversity Informaticians'.

One hopes, with the NBIO draft coming into action, comprehensive, coordinated, and sustained observation systems among governments and the international community to understand a d address global environmental an economic challenges, will be shaped.

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