

editorial & opinion

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Disaster readiness: Odisha shows way

Odisha has come a long way from its terrible experience of the 1999 super cyclone which killed over 10,000 people and caused unprecedented devastation in the coastal areas of the state. The cyclone Fani, rated 'extremely severe', which hit the state on Friday, caused 29 deaths and affected about 10,000 villages and towns, but the state authorities and others who were engaged in the evacuation, rescue and relief work deserve credit for limiting the human toll and damage. Odisha learnt its lessons from the handling of natural calamities, especially cyclones to which the state is prone, and prepared itself well to face the calamity this time. It has improved its performance with every one of the three major cyclones it faced since 2013, and has won international recognition and praise for its disaster management efforts. The United Nations has praised the state's performance this time. It is not mean work to evacuate over 1.2 million people from the path of the cyclone in a short period of time, especially when the official machinery is busy with election work. But the state administration, with help and support from the central forces, disaster relief bodies, the armed forces, other agencies and non-profit organisations managed to accomplish the task. Cyclone shelters and relief camps were also set up and used extensively. Science and technology was effectively used to predict the occurrence, course and impact of the cyclone, and information from the meteorological department and satellite data helped much in this. Warnings were issued and precautions were taken well in time. Then media was put to use to convey timely information to the people and for communication among rescue and relief personnel. About 2.6 million mobile messages were sent to the people and radio, television and loudspeakers were put to good use. All this was backed up by adequate transportation facilities, which included special trains and other means of public and private transport. Rehabilitation of people and reconstruction of lost and damaged assets are a major challenge. Buildings and other assets, especially in urban areas like Puri, and crops and trees everywhere have suffered much damage. Sustained efforts and large financial resources will be needed for rebuilding and to compensate people for their losses. In recent years, the idea of constructing less costly but stronger buildings for residential and other purposes has gained some popularity in the coastal regions of Odisha. But the idea needs to gather more currency. Disaster management capabilities need to be further improved in view of the possibility of the threat of extreme natural phenomena increasing in future. Such capacity building should receive greater attention in other states also.

Beyond Eurocentric worldview

Ranas of Mewar in the 12th and 13th centuries encouraged and supported real mining innovation

As archaeo-metallurgists working in the seemingly remote areas of Aravalli Hills, our objective was to establish the technology and dates of the extractive metallurgy employed in the ancient remains at the three principle mines of Zawar, Dariba and Agucha in Rajasthan.

Through three millennia, these sites produced four metals (silver, copper, lead and zinc) by very different processes on a massive scale.

Our project began in the 1980s and our team members were drawn from Hindustan Zinc Ltd, the British Museum, the M S University of Baroda, and the Peak District Mining Museum, Derbyshire. (Read: DNA Opinion 29-3-2019).

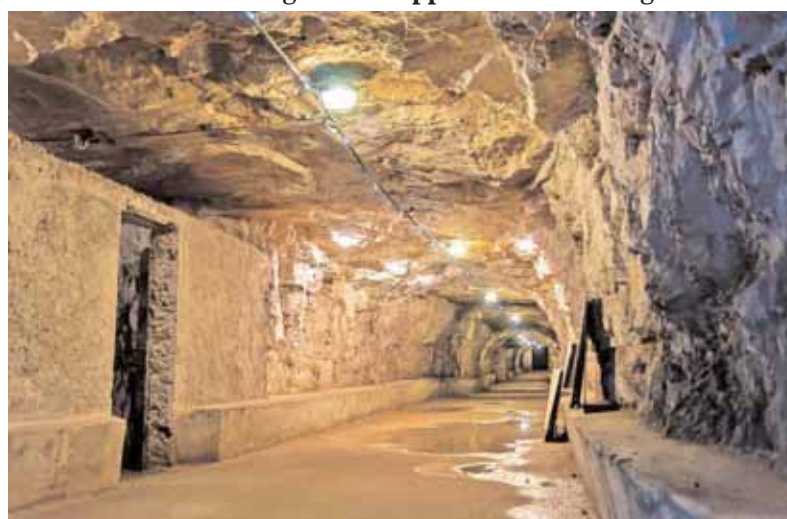
We were aware that most studies of ancient technology were based on the Egyptian, Greek and Roman civilisations. Now, for the first time, we had the opportunity to, literally and metaphorically, dig deeper into the ancient mines of Mewar, Rajasthan and study long-term development of the major industry, far away from the Graeco-Roman world. Going beyond the Eurocentric worldview was certainly one of our objectives. We wanted to expand the study of industrial technology innovation.

The development of the zinc distillation process at Zawar near Udaipur was evidence of large-scale production during the first millennium AD.

The mines at Zawar would always have been under the control of the ruling authority. Clearly here, the rulers (the Ranas of Mewar in the 12th and 13th CE) were encouraging and supporting real innovation, not so much of theoretical science, but rather of efficient, workable high-tech processes. This was to be achieved by standardised industrial-scale production of the necessary components of the process.

At Zawar, for example, there must have been hundreds, if not thousands, of the furnace blocks, fitted with components such as the perforated plates with identical dimensions. Clearly, tens of thousands, if not hundreds of thousands of these components, must have been made in central workshops to maximise efficiency and also to ensure the maintenance of overall control.

This spirit of innovative experimental development is not usually associated with medieval India. It was certainly not the impression gained by the European geologists and mining experts on their surveys in the 19th century. V Ball, an Irish geologist, who joined the Geological Survey of India, summed up the state of mining in Rajasthan in 1881, "Mining has been practised on a large scale, but at present the trade of the



miner is becoming extinct, and operations, which are only carried on in a few localities are of a very petty nature." (Ball is credited with compiling 'A Manual of the Geology of India'.)

In contrast, on first visiting the underground mines at Zawar in the 1980s, our team was impressed by the scale and obvious systematic organisation of the early operations. This was so much in variance with the European descriptions of the last indigenous mining operations still taking place in 19th century India. And it must be confessed, the mines were beyond our expectations too.

The mines were in an excellent state of preservation; it did take us by surprise. We assumed that these must be late workings, contemporary with the last recorded operations in the 18th and 19th century at Zawar. But the surprise was even greater when the radiocarbon dates showed the underground workings to be ancient, going back to at least 2,500 years. In our report, Early Indian Metallurgy (PT Craddock, KTM Hegde, LK Gurjar, L Willies), we have stated that the previous millennial operations had been conducted in a more superior fashion to those employed in the 19th century. Clearly, there had been a regression.

What the Europeans had observed in the 19th century was not the unchanging primitive technology of a system incapable of improvement, but rather a relatively recent response to collapsed authority.

We, as a team, were enthused to examine these conflicting paradigms of stasis and innovation as exemplified by these three mines, throughout their long histories. For conventional archaeologists, early smelting sites pose daunting prospects. In general, very little in the way of furnaces or other technical structures can be expected to sur-

vive in situ, in their original place.

The zinc smelting furnaces at Zawar are exceptional in this respect. In Dariba, for example, the principal surviving process evidence is the featureless heaps of production debris sometimes extending over several square km to a depth of several metres at the major mines. The heaps consist mainly of slags and are largely devoid of recognisable artifacts that could offer information on the process or dating. Ore sampling also poses its own challenges. It seems simple: we only have to sample the ore remaining in the walls of mines. But there is the obvious problem that the ore that remains today was the ore, which the previous miners did not want! This is well exemplified by Agucha where the zinc-rich deposits were left behind. Often the ore still found in the mines may have been considered unprofitable to continue. Moreover, if the silver content of minerals, left behind in the huge ancient galleries, is low, it might have been that the much higher content ore has been removed. I would like to stress again that these are enormous mining sites. Our visits in total only amounted to a few short weeks spread over five years.

We concentrated very specifically on mining and extractive metallurgy technology. Important issues relating to occupation and infrastructure were not being addressed. At Zawar, for example, there are excellent surviving medieval temples, fortress and post-medieval house ruins. We did not have the time, resources or necessary expertise to attempt studying them. We hope our surveys and reports have at least exposed a representative sample of the mining and metal production activities carried on at the three sites over the millennia. It can form the basis for further more targeted work on specific areas.

Needless politicisation

A nation's security is vital, it cannot be made subservient to any party's electoral ambitions or self-projection by any leader

In the overly acrimonious rumble and tumble of the general elections, security issues, as never before earlier, have been dragged needlessly into the political discourse.

The term "surgical strike" has become flavour of the season with the ruling dispensation flaunting it unabashedly to showcase its patriotic fervour and its 'muscular approach' towards an errant neighbour.

Not to be left behind in the narrative of nationalism, principal opposition party Congress too has joined, though rather late, in the cacophony for not being left out to reap some electoral benefit. Just the other day, the Congress released the details of the six surgical strikes they stated were conducted during the UPA-1 and UPA2 era as also of two strikes during former prime minister A B Vajpayee's tenure.

That the present government scoffed at this revelation dismissing it as a "Me Too" response was largely expected in the vitiated current political environment where truth has become a daily casualty. Cross-border operations have taken place for many decades, however, these are not publicised for obvious reasons.

A surgical strike is primarily a precision military attack on legitimate military targets with no or minimal collateral damage intended to be caused on innocent civilians or civil infrastructure. For a nation to deal with its adversary's mischief, there is a range of alternatives encompassing political, economic, diplomatic or military options.

In the latter choice, surgical strikes whether by land, sea or air are possible on enemy military or terrorist targets with this kinetic option being exercised which is short of a limited or a full-scale war. These swift strikes are intended to send out the requisite stern message to an erring neighbour/adversary to instill in them that any further provocations will be met by a strong response.

Thus, without ascending to the top rung of the escalatory ladder, that is a full blown out war, surgical strikes can be eminently useful in peacetime or a 'no war- no peace' situation in conveying an appropriate message to a potential adversary.

In recent times, after the Pakistani terror attack against an Indian formation in Uri in J&K in September 2016, the

Indian Army carried out well coordinated and very professionally executed surgical strikes against six different Pakistani targets across the line of control in J&K on September 29, 2016 inflicting a fair number of casualties/destruction on these targets.

That Pakistan, as is their won't, denied the conduct of any such attacks is a different story. However, two months later on November 29, 2019, Pakistan terrorists once again struck at an important Indian military base in Nagrota, deep inside J&K, which did cause some discomfiture to us as to the long term efficacy of these strikes in deterring the enemy.

The major lesson emerged that one odd surgical strike does not restrain a recalcitrant and mischievous neighbour.

Following the dastardly Pak terror attack on a CRPF convoy on February 14, 2019 at Pulwama which resulted in 43 fatalities, the Indian Air Force carried out a surgical air strike in the wee hours of February 27, 2019 across the international border against a suspected Jaish-e-Mohd (JeM) terror camp in Balakot deep in Pakistan's Khyber Pakhtunkhwa province.

Reportedly, 12 Mirage 2000 fighter bombers were employed in the surgical air strike and all returned to base safely after inflicting damage to the terrorist facilities in Balakot.

That India by striking deep inside Pakistan territory (beyond the Pakistan-occupied-Kashmir region) did change the nation's counter-terror response was a positive change in the security paradigm for which the present government needs to be commended. The era of "strategic restraint" was rightly given its due burial. However, the over-hype of this action should have been avoided.

Pakistan retorted within 24 hours after this strike by targeting, though unsuccessfully, the IAF also announced the shooting down of a Pakistani F-16 while it lost one of its vintage MiG 21 while intercepting the intruding Pakistani aircraft.

Indian flying ace, Wg Cdr Abhinandan, piloting the MiG 21, was captured by the Pakistanis and subsequently expatriated to India 48 hours later. With this, many useful lessons - military, political and diplomatic - did emerge.

Baghdadi video is ominous

If the recent video released by the Islamic State's (IS) al-Furqan media network is genuine — independent confirmations of the authenticity of the video are awaited — then its founder-leader Abu Bakr al-Baghdadi is alive and well. The last time al-Baghdadi was seen in a video was in 2014, when he proclaimed from Mosul the creation of a 'caliphate' across parts of Syria and Iraq. In the five years since, the IS did not release any propaganda videos featuring al-Baghdadi, triggering speculation that he may have died in an aerial strike. Indeed, Russia's defence ministry claimed in 2016 that the world's most wanted terrorist was killed in airstrikes. However, audio clips of al-Baghdadi's speeches were released sporadically over the years — the most recent in August 2018 — suggesting that for some reason IS did not want the world to see its chief. Was the man who carried a \$25 million bounty on his head seriously injured or ailing? The latest video of al-Baghdadi, the first to be issued in five years, suggests that he survived the many bombs that rained down on IS territory over the past five years, including the IS' final stand at the battle of Baghouz last month. In the video recording, al-Baghdadi acknowledges the IS defeat at Baghouz. He warns that there is "more to come after this battle" for Baghouz and swears that he will "take revenge" for IS fighters who fell in the battlefield. He praises the suicide bombers who carried out the attacks in Sri Lanka on Easter Sunday and describes the bombings there as "vengeance" for IS fighters who were killed while defending Baghouz. Interestingly, al-Baghdadi's image disappears when he discusses Sri Lanka, suggesting that this part was recorded after the video was made. The video featuring al-Baghdadi underscores the fact that the IS chief has not just survived but that he is alive and kicking. Following the defeat of the IS in March, the Trump administration boasted that the war was over. The suicide bombings in Sri Lanka indicated that it was not. It had only taken a new form. The IS has admitted to defeat in one battle. The war, as al-Baghdadi reminds us in the video, is not over. IS has made major inroads in South Asia, including India. With the IS' strategy changing, and especially in the context of the recent suicide bombings in Sri Lanka, India must wake up to the possibility of IS sleeper cells here being activated to carry out attacks. In Sri Lanka, IS and its local links struck at soft targets. Similar targeting of soft targets in India cannot be ruled out. India must be on guard.