

IT and coolieization

The guest editorial by Gangan Prathap¹ was quite interesting, warranting response. The issues raised are related to 'brain drain' and in that context quite old and fairly new; the difference lies in specialization. I may mention that I have heard this word in the mid-sixties, while in school. Human migrations are part of history and several records exist of mass migrations for better opportunities or sheer expansion of areas of influence or spread of religion, etc. Folklore and several written ancient accounts bear that migration to foreign lands for earning was common, requiring no special mention. This underscores the fact that migrations are directly related to opportunities, given the right to choose. This simple relationship under certain circumstances is violated, as what happened under colonial rule when many of our brothers and sisters were lured to work as bonded labourers, the migrations today are under free will and cannot be criticized. Our concern should be to examine honestly as to why the migrations of this magnitude are taking place. Can we make honest and sincere efforts to understand and create conditions to reduce, if not stop migrations? While the editorial has successfully projected the problem, it has not given hints towards any solution.

The other aspect raised in the editorial is the case of IT and the system of education/subjects promoted relying heavily on the observations of some researchers. India, in the past and even today (in spite of plunder!) hosts one of the richest biodiversities in the world. Our dependence on vegetation and plants is more than in many other societies. Considering this, study of flora and fauna was and is important. Present-day ONGC, which is an offshoot of GSI, has proven its utility beyond doubt. It may be mentioned that under the influence of external forces both these organizations were suppressed. Had they been allowed to work with freedom, openness and sense of responsibility and greater focus, our plight in terms of energy would not have been as pathetic as it is today. As far as the lop-sided development of core sciences is concerned, our colonial masters cannot be wholly held responsible. We have not made concerted serious efforts to develop a footing in the field of instrumentation. This has seri-

ously affected our performances in almost every field of science requiring instruments.

One area, which grew solely out of individual's efforts is IT. The government joined it later, more as a facilitator, rather than a controller (fortunately!). The progress in IT has caught the imagination of Indians and presently, it is one of the important sectors offering employment to our educated young ones (sadly, it cannot have any place for illiterates and semi literates due to its limitations and not due to any design). How should we view this? Shall we sing the praise or reject it outright, mentioning that it has generated coolies? Fortunately for us, the truth lies between these poles. Those who consider Indian IT as a coolie-generating technology may suggest what should be done to reverse this trend. This is their intellectual responsibility, which they must fulfill.

The unequal balance among world currencies and our inferiority complex are the causes, for accepting projects with a foreign tag even on unequal footing, although there may be some exceptions. Strangely, science establishments support foreign projects of dubious distinctions.

Regarding the 24 h day, this may be equally advantageous to Indian companies operating from USA. It is just the question of having a critical mass.

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I can only say that I am simply appalled by both the utter irrationality of the arguments put forward, and the barely disguised envy of the IT sector manifest in every line of the guest editorial by Gangan Prathap¹. I would have expected something more rational and more balanced from him.

The editorial starts by quoting E. M. S. Namboodiripad. It is his government that set in motion the various anti-growth policies that continue to plague Kerala even today. It used to be true that Indians could prosper only outside India – no longer, thanks to the spectacular growth of the IT sector. But it continues to be true that a Keralite has to leave Kerala to find jobs in sunrise industries (including, dare I say it, the IT sector).

Until the IT sector came along, the world's image of India was that of a nation of beggars, a basket case, continuously dependent on external aid even for food and shelter. Whether this was true or not, was immaterial. That was the prevailing image nevertheless. Who is responsible for changing the perception of India to that of a happening nation that is aspiring to its rightful place on the world stage? Any honest person would agree that the IT sector has almost single-handedly brought about this transformation in perception.

Today other sectors of the Indian industry, most notably the biotechnology (BT) and pharmaceutical sectors, and the automotive sectors, are riding piggyback on the positive image of India created by the IT sector, to seek their own place under the sun. Surprisingly, members of these sectors (and I can speak authoritatively at least about BT) have no hesitation in acknowledging IT for opening their doors to the world.

Comparing Indian science to that at MIT and Caltech is ridiculous. We never had anything even remotely resembling MIT or Caltech even before the big bad IT industry appeared on the scene to lure away our unsuspecting youngsters to 'coolie' jobs. What Indian 'science' used to offer to our youngsters were also just 'coolie jobs' in any case, toiling away in some obscure laboratory taking orders from some out-of-touch 'research supervisor'. Most of the so-called research that is carried out in our academic and R&D institutions can only be described as crap. To call it second-generation or derivative barely does justice to those words. Analyses of the number of publications from India, or their citations, some of which have appeared in this journal, reinforce this impression. I can quote my own field as an example. The leading journal in the world in control theory is *IEEE Transac-*

tions on Automatic Control. Until I returned to India and started publishing in it with an Indian affiliation, I believe there was not a full paper from an author in India for over ten years! So let us not bemoan that all of our 'brightest' are no longer entering traditional fields of research. Thank God, they are able to find alternate and fulfilling careers at last!

The article is riddled with inaccuracies. A. M. Naik, CEO of Larsen & Toubro, is quoted as saying that 'Around 95% of the students passing out of engineering colleges head either to the US or to Europe or any other part of the world'. Naik, if he really said it, ought to have done his homework carefully. Around 400,000 engineering graduates are produced by India every year. The number of H1-B visas this year is 65,000 and it

never crossed 195,000 even at the peak. The number of F-1 visas issued by the US consulate is around 35,000 per year. In no way do all these numbers, even if they are added up willy nilly, come close to 95% of the engineering graduates. I can go on, but that would be pointless. (I might add in passing that when the US was issuing 195,000 H1-B visas per year, a large number of the beneficiaries were graduates from the various training institutes such as NIIT and Aptech, and not from the traditional engineering programmes.)

In the final analysis, the situation can be summed up very simply. The old arrangement whereby the number of engineering seats was restricted, ensured that youngsters studied, for example, civil engineering even if they had no interest in it, just because there were not enough

seats in sunrise disciplines. The licence permit-quota raj ensured that non-competitive industries stayed in business long after they deserved to go out of it. Today, all these are things of the past. Only industries (and R&D institutions) that adapt to the new realities will flourish.

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Impact of tsunami on meiofauna of Marina Beach, Chennai, India

The correspondence by Altaff *et al.*¹ has confused my understanding about the physico-chemical characteristics of coastal waters. I have the following comments.

The units for temperature (both air and water), dissolved oxygen (DO), salinity and Eh have not been mentioned neither in the table nor in the text.

Generally, DO is expressed in mg/l. The DO values reported by Altaff *et al.* ranged from 1.86 to 3.72 mg/l, which is extremely low. Normally, in a coastal milieu the DO values range between 5 and 7 mg/l if there are no external factors influencing them other than the photosynthetic activity and DO exchange between atmosphere and water. The values reported by Altaff *et al.* give an impression that either something is totally wrong with the method followed or the values were really low and needed further investigations to fathom the cause. As it is well known, when the DO values are less than 4 mg/l, there is bound to be danger to marine organisms, particularly to the fish population. The very low values are possible only when substantial organic pollution exists at the sampling location. It could also be possible when the plankton population in the coastal waters increases substantially, leading to a bloom situation. In either case (industrial pollution or blooming of plankton), the DO is reduced due to its consumption in the process of

oxidation of polluted organic matter or oxidation of dead plankton.

In case the authors have expressed the values in ml/l, the situation is not significantly different as the values when converted from ml/l to mg/l, will result in a range from 2.65 to 5.3 mg/l, wherein all values except two (Table 1) fall below 4 mg/l.

Therefore, it is incorrect to say that 'though there are minor variations in the temperature, DO, salinity and Eh prior to and after the tsunami, these appear to be of normal occurrence rather than due to the impact of the tsunami. Nevertheless, higher oxygen content during the post-

tsunami period might be due to higher wave action facilitating more dissolution of atmospheric oxygen into coastal sea water'. In fact, the DO values as reported by Altaff *et al.* during pre- and post-tsunami period are very low and thus needed a thorough scientific investigation, as their repercussions were very high at that point of time. The possible reasons for very low values during post-tsunami period (assuming that estimated DO values are correct) could be due to the fact that the large amount of organic matter that has been brought from the bottom of the sea to the surface, as evident from the large amount of silt deposited in the tsunami flooded area, would have consumed DO and thus brought it down to very low values. However, it is not possible to provide any plausible reason for the low DO values observed by the authors during the pre-tsunami period.

With regard to salinity values, they ranged from 25.86 to 32.14‰ (standard notation used for salinity expression) with all values except one falling within 30.53‰. These values are expected during December/January at Chennai. These relatively low values are always associated with precipitation from northeast monsoon. The authors have not mentioned about the rainfall values during the study period. Moreover, it is incorrect to say that 'physico-chemical parameters as well as

Table 1. Dissolved oxygen content of Marina Beach sea water during pre- and post-tsunami period

Period	DO (ml/l)	DO (mg/l)
November 2004	1.86	2.65
December	2.27	3.24
Day 1	2.48	3.54
Day 2	2.69	3.84
Day 3	2.48	3.54
Day 4	2.89	4.1
Day 5	2.07	2.96
Day 6	2.69	3.84
Day 7	2.48	3.54
Day 13	2.69	3.84
Day 24	3.72	5.3