

## Will weaponization make us secure?

This is in response to the letter by Balasubramanian *et al.* (*Curr. Sci.*, 1999, 76, 1290–1291). We disagree with all the four points raised by them but deal here with only the fourth point raised in their letter.

They justify the cost of nuclear weaponization, billed at Rs 40,000–50,000 crores in the next ten years, on the plea that it would consume only 1.5% of the budget and improve the security. Regarding security, one cannot be sure. The recent events in Kargil must act as a hard lesson for the deterrence–security theorists, but the point is – 1.5% of the budget should not be treated as ‘negligible’ as they make it to be. It would have been so if and only if we had a budgetary surplus; but our revenue deficit (current expenditure minus current revenue) today is more than what it was in 1991. We all know what extraordinary steps were taken in 1991, under the structural readjustments programme. One of the aims of this was to bring down the fiscal deficit from 8.4% in 1990–91 to about 6% in 1992–93 – the difference being a mere 2.4%! But such an exercise needed a major overhauling of the economy which is still far from over. And to recommend now a further increase by 1.5% (as done by Balasubramanian *et al.*) may prove to be suicidal for the country. Let us remember that the above amount if invested in conventional power sector, can bring an extra 7000 MW of installed capacity, considering the present rate of cost escalation, not a small amount at all in the present scenario. The Government of India had accepted a goal of 6% of budget expenditure for education, but has never reached that modest target with levels of illiteracy still remaining high.

This 1.5% increase being proposed for defence will still leave us short of the accepted level of expenditure on education. We have also need to consider health, drinking water and the like that have not been brought into this argument. UNICEF has made a number of interesting calculations that should be looked at by those recommending such increases in military expenditure. One also has to consider what roles these elements of the economy play in the context of security.

The main point is that in economics, a difference of merely 1.5% often gives rise to a cascading process that is difficult to control. Enhanced defence expenditure, at the cost of development projects, as may happen during wars do snowball as major economic crises. This was evident after the Bangladesh war also as the annual economic growth rate fell from 5.41% in the previous year to 1.8% in 1971–72. And India at the time was a country with very little external debt! At present, close to 30% of our foreign exchange earnings are spent in foreign debt servicing. If we consider internal debt, the task is much more daunting.

The suggested 1.5% increase in nuclear weapons, according to us would be inflationary. With poor revenue collection, the nuclear weaponization project has to be financed through money borrowed from the RBI and other sources. Private sector would be ‘crowded out’ – there would be less money for it to borrow, and interest rates would rise. This would restrict the availability of money for the private industries, and also make it more costly. They would then raise the prices of their commodities to recover their expenditure. This would set off a cycle of inflation. This inflationary

impact would have serious consequences on the poor, whose number is now on the rise, even though the country did not have a crop failure in the last decade due to unusually good monsoon. Economic programmes which are catastrophic for the poor have hardly any relevance for the future of our country. The security question cannot be separated from this basic issue. The real security, as the seminal works of Amartya Sen have established, cannot be judged merely in terms of security in wartime but is also linked with the security of the people at the time of peace. Balasubramanian *et al.* raise no such concern and hence find the weaponization costs to be marginal. The hidden, social costs are the ones, which we should ponder over.

The country that is most secure is the one whose citizens have a stake in it for their well being. In India, the poor peasant has suffered for many centuries – whether it was the Moghuls or the British, he found life very hard. After independence, expectations were high. Some improvements have indeed occurred, but the majority still live in pathetic conditions. If their living conditions improve, it will be the best security we can have. And if they do not, no amount of military expenditure will give us a guarantee of ‘security’.

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## Manipulation of ammonia assimilation in improvement of nitrogen use efficiency

The review article by Abrol and co-workers on the physiological and molecular approaches for the improvement of nitrogen use efficiency (NUE) in plants deals with the aspects of nitrate

uptake and nitrate assimilation but the other important aspects of NUE, i.e. ammonia assimilation and amino acid transport have been insufficiently covered (*Curr. Sci.*, 1999, 76, 1357–

1364). Nitrate acts as a signal molecule for nitrate-dependent ammonia assimilation as described, which possibly also involves  $\text{Ca}^{2+}$  and protein phosphorylation<sup>1,3</sup>, but the internal pool of

ammonia and glutamine/glutamate ratio are also considered significant to regulate NUE<sup>4,5</sup>. Further, in nitrogen fixing legumes and in plants growing under anaerobic conditions, ammonia and not nitrate is the major nitrogen source. Under certain conditions, significantly high amounts of ammonia are regenerated inside the plants by photorespiration and catabolic activities. In such cases, manipulation of NUE has also not been dealt in the article.

Transgenic *Nicotiana plumbiginifolia* plants constitutively over-expressing NR activity resulted in lower nitrate content compared to the wild ones. In this case, however, total N and biomass production have not been increased<sup>6</sup>. Contrary to this, in transgenic *Arabidopsis thaliana*, over-expression of NR activity yields an increase in protein content by 200% than the wild-type<sup>7</sup>. This indicates that a functional role of NR over-expression is species-specific and requires more studies to determine its importance in NUE by the crop plants. Transgenic plants modifying the expression of glutamine synthetase (GS) and glutamate synthase (GOGAT), the key enzymes for ammonia assimilation have been produced recently<sup>8-10</sup>. The expression of cytosolic GS of soybean origin in shoots of transgenic *Lotus corniculatus* plants triggers changes in ammonia assimilation and plant development, leading to early senescence and premature flowering<sup>8</sup>. Similarly, genetic engineering techniques have recently been employed to produce

transgenic tobacco plants expressing a Fd-GOGAT cDNA fragment in the antisense orientation under the control of CaMV 35S promoter<sup>10</sup>. Further, due to the importance of internal gln/glu and other amino acids in regulating NUE by the feedback catabolite repression effect, the transport and translocation of amino acids to different parts of the plant and their redistribution are also very significant<sup>1,4,5</sup>. Tissue/substrate-specific amino acid transporters have recently been characterized in the plants which show an analogy to yeast amino acid transporters<sup>11</sup>. Genes which encode these transporters and plant mutants for such transporters are now being used to regulate the NUE.

Thus, it appears that cloning, transfer and regulation of expression of GS and GOGAT in the transformed plants are possibly more effective strategies to modulate NUE as they catalyse a key central process of NUE in all plants irrespective of the source of inorganic nitrogen input. Efforts are being made to produce transgenics with modified expression of various isoforms of ammonia assimilating enzymes, e.g. GS, NADH and Fd-GOGAT and NADH/NAD<sup>+</sup>-GDH to regulate NUE in a desired manner. Such studies not only improve the yield and productivity of the plants but also manipulate the nutritional qualities and the physiological responses.

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## Reviewing: A disliked necessity

This is a response to the editorial 'Peer review' by P. Balaram (*Curr. Sci.*, 1999, 76, 1288.). The 'obvious imperfections' of peer evaluations are not so much due to the imperfection of the process as due to the imperfection of our 'peers' and much more due to the imperfections and intolerance of the authors. I must add that quite often the behaviour changes quickly with the role as an author or a reviewer. This stems from the attitude that I know more than anyone else. This is more common with senior persons who start relying on their students and still expect that whatever and wherever they submit

should get accepted and be published. A common problem with the vast majority of Indian authors is that they rarely care for or devote time to search the published literature. The common refrain is that it is not accessible. It is quite simple to state that there has been no study of the kind being reported by the author. Whether the reviewer points out the shortcomings in detail or rejects the paper without meaningful comments, the authors blame the reviewer.

Majority of the Indian reviewers (peers) of course, do not go through the manuscripts critically, and rarely devote

time to offer suggestions for improvement. However, the reviewers should also be not expected to rewrite the paper, supply references or analyse and interpret the data.

With regard to the importance of a peer evaluation and its anonymity, I wish to give two examples from my personal experience. First, the editor of the *Journal of Aquatic Ecosystem Health and Management* (then published by Kluwer) sent to me a long manuscript on the problems, control and utilization of water hyacinth. Going through the manuscript, I developed a feeling that I had read it