

tivars that reduce the pesticide use on crops, and their load in the environment – precisely what Carson advocated. Her writings show that she was not for total ban on pesticides, but for their judicious and limited use. She strongly opposed the aerial spraying of DDT in Long Island, New York. It is unfortunate that aerial spraying of endosulfan was practised in Kasargod, Kerala even after 50 years of her widely read publications. (ii) Long-term effects of GE crops are studied using animal model systems with shorter lifespan. Feeding experiments with GE crops on humans with a lifespan of 75 years cannot be done. The results of such experiments can show any of the three possibilities: (a) no effect, (b) in-

creased lifespan or (c) higher morbidity and reduced lifespan. If the experiments show the first two, the opponents will demand data on the effects in the progeny of such people. Their aim is to delay the approvals.

Two statements mentioning that GE crops are not the only solution, and like all other technologies GE has advantages and drawbacks are correct. However, currently GE happens to be the most powerful tool available to move the desired genes into crop plants from the same and alien species, or even synthesized genes. Lastly, human-directed evolution using contemporary knowledge and tools has been practised since the domestication of plants and animals. It

remains the best way to feed the growing world population.

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  2. Padmanaban, G., *Curr. Sci.*, 2011, **100**, 157–158.
  3. Carson, R., *Silent Spring*, Houghton and Mifflin, Boston, 1962.
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## Registration of geologists

With increasing developmental activities, the demand for expertise is also increasing that ensures safety of investment and also to comply with the mandatory existing rules and regulations. To fulfil the above objectives, the field of consultancy is proliferating and getting complex day by day because of emerging technologies and issues. The expertise can be sourced from various sectors like the government, large to small private companies, NGO and individuals. The demand for geological studies and certifications for any kind of activity which is concerned with the earth, be it is in construction of buildings, roads, railway lines, power transmission lines besides conventional roles of geologists in the fields of exploration, prospecting and development of mineral, petroleum and coal deposits in mining, dams and tunnels, etc., is logically also on the increase. Geology is as specialized as medicine or any other field. At the same time, there exists phenomenal ignorance about geological processes/actions in society; this is because of the lack of incorporation of geological topics in the school curriculum and limited requirement of the geologists in the formal set-up.

Usually one becomes a qualified geologist by obtaining a postgraduate degree in pure or classical geology, and if one devotes an additional year, he/she can obtain a degree in applied geology or can do a specialization in any branch of his/her choice. After field experience, one can handle tasks independently.

Till a decade or two ago almost all trained geologists were employed in government jobs. With a change in economic policies, now sizable numbers find opportunities in the private sector. Many a times, one cannot approach government agencies or private organizations for small geological jobs to be done. In this situation one has to rely on geological advice of individual or small firms. Their reports are used to substantiate claims. Though such reports are legally acceptable, their legal accountability may be questionable. Secondly, geological studies rarely require a second opinion because no adverse effects on geological parameters will be visible during the construction stage. At times geologists are hired for fulfilling the mandatory requirements when work is in advanced stage of completion or in the case of nearly complete cases of manned

reports. If something goes wrong at a later stage, the blame may be put on many non-geological factors as geological studies are not taken seriously/attempted at all. Yet a sound geological study would reveal the pros and cons of a terrain with remedial measures. To fulfil the objectives of safety and durability of a structure we need a system of legal accountability of those who provide geological inputs or give certificates. One step in this direction is to make the registration of geologists mandatory with some competent authorities, for example, with the Geological Survey of India or State Departments of Geology. The registration may be made compulsory for jobs in the government or private sector, or for consultancy work. The registration may be similar as that of chartered accountants, doctors or lawyers. This approach would not only inculcate accountability in practising geologists, but also a demand for accurate geological studies.

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