hence the water is potable. Bald rocky areas lack such favourable conditions as they do not permit infiltration of water. Thus, these rocks indicate paucity of groundwater.

(iv) Surface water bodies like tanks, ponds, lakes, streams, reservoirs and rivers serve as sources of recharge to the nearby areas. Thus, if we sink wells in and around the areas of surface water bodies, the wells can yield sufficient water.

(v) The study of existing wells in the vicinity of the proposed well sites with respect to soil cover, rock types (hard rock or soft rock) and their structural conditions (fractures, joints, faults, etc.) depth to water table and well yield is essential to have a clear picture of the hydrogeological conditions of an area.

(vi) Scanning of sub-surface hydrogeological conditions like depth of soil zone, weathered zone, fractured/jointed zone and unfractured zone from the ground surface is essential. From these surveys, it is possible to assess the depth of saturated zone and water quality (saline or non-saline). Such surveys should be conducted in summer to know the real depth of the saturated zone. This zone is generally deep in summer and shallow in the other seasons. If we conduct the surveys in seasons other than in summer, there could be decline or dry-up of water conditions in summer, as the shallow depth of saturated zone observed from the remaining seasons can decline.

(vii) If two wells are situated close to each other in a more or less plain land, the supply of water can be greatly affected due to well-interference, when both the wells are pumped simultaneously, especially in summer. This is because, the water in a shallow well can get depleted or dried-up rapidly than the water in a deep well. Thus, it is important to maintain a distance of 150–300 m in alluvial areas and 75–150 m in rocky areas between two wells.

(viii) The water level in any area can decline or dry-up in summer due to lack of infiltrating recharge. But, the depletion of water level can be rapid in the uplands than in low-lying areas of the same place due to heavy pumping of wells in the low-lying lands, which sometimes lead to drying of wells, irrespective of the distance of wells between them. These conditions can reach alarming levels, where the apartments are more due to over-exploitation.

(ix) For large scale of well-sinking programme, integration of satellite data with hydrogeological data, can help in making rapid survey of an area.

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ICAR: time for introspection

The Indian Council of Agricultural Research (ICAR) was established with the mandate of teaching, research and extension in the farm sector through agricultural universities and national institutes catering to the need of training young students and scholars in the country[1]. It is time for introspection regarding functioning of ICAR.

For the last two decades, teaching posts are either lying vacant or there is no increase in the number of such posts. ICAR is not questioning how the universities are running several undergraduate and postgraduate courses with only 2–3 teachers. Students, after obtaining a master's degree, enter into diverse fields such as banking or railways, or appear in IAS/IFS exams. Some universities have parameters such as NET/GATE, a Ph D degree, publishing record and research experience for selection. In others, no such criteria is followed.

Frequent transfers of talented people to work on a different crop and interdisciplinary transfers on executive grounds, of incompetent and disinterested personnel, from research to extension or teaching to research or vice-versa are common. This overlooks the fact that they are selected for their ability to work in well-defined fields. Another major cause of decline in research and teaching is reservation. Relaxation in marks and seats compromises the quality and quantity of the output.

Agriculture curriculum has no separate course for fungi, bacteria or viruses in graduate programmes; but there is a separate course on nematodes. ICAR is running research projects without any time-frame. Some projects have been running for more than three decades without any breakthrough research being reported. A reassessment of all the projects should be done by a review committee comprising specific subject/crop experts. The ICAR grant is customarily not received in time and the university disburses salaries out of the research grant. This delay in receiving grants affects timely field operations, procurement of seeds, fertilizers, pesticides and sowing.

Research posts in time-bound coordinated projects are also lying vacant. Normally, in a coordinated project set-up (of any crop) four kinds of scientists are required, viz. a breeder, an agronomist, a pathologist and an entomologist. But in most of the projects, posts are lying vacant. There is loss of season, loss on data of trials which are to be conducted under specific conditions (rainfall, temperature and duration being season-specific) and at a specific location. At times breeders make pathological observations and often entomologists record pathological data. In many universities and national centres, equipments are purchased when the organization does not even have the space to install them. Thus they remain unused after demonstration.

Some unethical practices are not uncommon in farm research, such as sowing on a large area and filing yield data for a lesser area (to demonstrate higher yield), roguing of diseased plants to show disease-free field and variety, and taking rainfed trail of crops and irrigating the field in the name of life-saving irrigation.

ICAR had initiated Krishi Vigyan Kendra (KVK) in each district to learn about technologies through 'on-farm demonstrations', for giving training to farmers, especially women workers, and regular advise by organizing Kisan Melas. Except in a few centres, posts are lying vacant or there are only 2–3 staff. Good infrastructure, farmers' dormitory, guesthouse and land are available, but

remain unused. No KVK has a model farm that combines agriculture, horticulture, veterinary and agroforestry with water conservation, for demonstration to 'marginal farmers'.

The Agriculture Technology Information Centre (ATIC) was initiated with a novel concept that the farmers will get all the information regarding agricultural products, dairy, poultry, piggery, goat-rearing technology and equipments through a single-window system. But many did not share their produce, seed, poultry and dairy products with ATIC. The Centre cannot get financial support unless the products are sold through it according to the ICAR guidelines.

ICAR should undertake corrective measures, as it is the only national organization responsible for the agricultural sector in the country.

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Unusual foaming along Thiruvananthapuram coast

Unusual foaming was observed on 18 and 19 October 2009 along the coast of Thiruvananthapuram, Kerala, India. A similar phenomenon was reported in 1999, which suggested that foaming in coastal waters of the Northern Adriatic, the English Channel and beaches of France, the Netherlands and Germany was due to the mucilage formed from the extracellular polymeric substances produced by the phytoplankton blooms (cells > 10^4 to 10^6 per ml) of *Chaetoceros affinis*, *Skeletonema costatum* and *Phaeocytis*. These are known to produce a narrow stretch of foam in offshore waters.

The analysis of phytoplankton (Table 1) indicated that there was no phytoplankton bloom, as in the case of foaming reported elsewhere. No species as reported in the literature was found in the foam. Analysis of the water and sediment samples collected from the foamed regions did not reveal anything peculiar. The foam was found to be milky-white and was retained in the beach sand. The sandy beaches of the coastal belt extending from Puthencope to Puthukurichy were found interspersed with dead jellyfish, *Rhopilema* sp. (Figure 1). In the laboratory, foam-creating experiments were carried out. Dead jellyfish washed off the shore were collected. A cut piece of jellyfish weighing 2 g was introduced into a series of 50 ml Nessler's tubes and each tube was half filled with sea water. The tubes were vigorously shaken. Milky-white foam formed on the surface of water column. The foam was similar to the milky foam formed at the study site. The foam stayed in the tubes for a period of 30–45 min.

Table 1. Phytoplankton species reported from Thiruvananthapuram coastal foam

Phytoplankton species	Cells/ml (n = 10)
Asterionella japonica	8
Ceratium extensum	6
Chaetoceros curvisetus	16
Chaetoceros diversus	11
Coscinodiscus sublineatus	31
Ditylum brightwellii	4
Holoccolithophorids	2
Rhizosolenia alata	9
Skeletonema costatum	27

Figure 1. Dead jellyfish washed ashore.

Our analysis suggests that foam formed because of the wave action upon gelatin released from the dead jellyfish. However, this is not a cause for concern, because no abnormal change in sea water or on biological productivity or fish catch was observed. Foaming in the coastal waters of India has not been reported thus far. The present study explains foam formation in coastal areas by strong wave action on the gelatin produced from the dead jellyfish.

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