

## Open geo-spatial consortium standards for sensor networks\*

A seminar on 'OGC standards for sensor networks' was held recently. Over a certain period, sensor web enablement (SWE) has become a content development workflow for spatial data infrastructures (SDIs). Due to its importance for generating information regarding earth processes across various scales, there is need for understanding design prototypes of SWE in the Indian scenario.

The objective of the seminar was to understand and explore areas of participation in OGC-related test bed standards, activities (OWS3, OWS4 and OWS5) and SWE, and implementation of conceived/inclusive prototypes.

About 300 participants from varied disciplines like computers, geography, community health, etc. attended this seminar. In the inaugural session, R. Shiva Kumar (NRDMS, DST) presented a lecture on OGC activities and its requirement for global observation of climate as well as local events. The Chair of inaugural session B. B. Bhattacharya (JNU), emphasized how space techno-

logy is exploring unknown locations and their economic significance.

Eight talks were delivered in four technical sessions apart from the inaugural lecture. In the first session on 'OGC standards and current trends for sensor web enablement', the lead talk was presented by B. N. Jain (IIT, Delhi) on 'Target tracking using energy constraints for sensor network'. He spoke about sensors, and their ability to detect a target, for tracking a fleet of vehicles based on the presence of the target in the vicinity and route activation in no time. He also stressed upon technologies to track mobile target using RFID, wired sensor network and GPS technology. Energy constraints/back-ups for sensor was discussed regarding bandwidth, range, interference and density of sensors. Jain also discussed applications, namely sensors for monitoring the environment, to locate sources of polluters/pollutants, predicting disasters, and to monitor and predict landslides in rail corridors. K. R. Murli Mohan (NSDI-DST) delivered a lecture on 'OGC standards for sensor network'. He stressed upon adapting OGC standards and architecture for SWE. Sameer Saren (IIRS (NRSA)) talked about 'Web-GIS services in distributed systems', where he shared his views on distributed web services given for interoperability, data dissemination and analysis. Uttam Kumar

(IISc, Bangalore) talked on 'Sensors and networks for geospatial data'.

In the second session, three papers were presented. Milap Punia (CSR, JNU) spoke about 'Sensor web enablement for traffic and perceptual studies'. He shared his views on the use of SWE for traffic monitoring in real time, so that one can plan his/her route in the wee hours. Generating volunteered information about elderly crime vulnerability for crime perception studies through geographic locations and their shared narrative. M. P. S. Bhatia-NSIT spoke on 'Machine learning application in sensor network'.

Harlan J. Onsrud (Mein University, USA) shared his views on 'Ethics and privacy perspectives of sensor networks'. He elaborated his views on 'How can privacy be protected in ubiquitous spatial computing environments?'. He also spoke about the use of passive RFID in retail marketing and ethical issues with some other possibilities.

**Milap Punia\***, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi 110 067, India; **K. R. Murli Mohan**, Department of Science and Technology, New Delhi 110 116, India.

\*e-mail: punia@mail.jnu.ac.in

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## National nutrition policy\*

The Indian constitution enjoins the Government to give a high priority to nutrition. Providing a balanced diet to meet the nutritional and not just the energy needs of every individual is not only a matter of human right, but also a necessity if the nation has to progress. A comprehensive National Nutrition Policy was

formulated in 1993 for providing the policy framework and strategies to improve the nutritional status of the population and set the goals for the future.

The new century has witnessed the emergence of dual nutrition burden in India. While under-nutrition and micronutrient deficiencies remain the major public health problems, over-nutrition and associated non-communicable diseases are increasingly seen, especially among urban and affluent segments of the population. The Tenth Five-Year Plan indicated that there is a need for focused and comprehensive interventions aimed at

improving the nutritional and health status of the individuals with a paradigm shift from: (i) Household food security and freedom from hunger to nutrition security for the family and the individual. (ii) Untargetted food supplementation to screening and targeted management. (iii) Lack of focused interventions on the prevention of over-nutrition to the promotion of appropriate lifestyles and dietary intakes for the prevention and management of over-nutrition and obesity.

The Nutrition Policy for the new century incorporating these is yet to be formulated.

\*A report on the symposium on 'National Nutrition Policy: Essential Elements'. The symposium was organized by the Nutrition Foundation of India, New Delhi and the Centre for Research on Nutrition Support Systems and held on 27 and 28 June 2008.

In 2008, the issue is being vigorously discussed, since recent surveys<sup>1,2</sup> show that India is among the countries of the world with the highest incidence of under-nutrition for which there is a high economic cost<sup>3</sup>. To add to the burden, is the rising incidence of over-weight and obesity, among even the middle-class Indians, thanks to the changing lifestyles and dietary preferences. The latter has led to alarming increase in the incidence of diseases like diabetes, blood pressure and coronary heart disease. Of particular concern in the Indian context is the finding that individuals who had suffered from intrauterine malnutrition and were born with low birth weight are more susceptible to the above-mentioned lifestyle-related diseases in later life, the so-called foetal origins of adult diseases<sup>4</sup>.

The question is – why is a country with good progress on the macroeconomic front not able to handle the problem of malnutrition when smaller, less affluent and less developed countries have been able to do a better job? Subsequent to the formulation of the National Nutrition Policy in 1993, a National Nutrition Council was constituted in the Planning Commission in 1994 under the chairpersonship of the Prime Minister. The Council never met. However, later a Food and Nutrition Council was constituted in November 1997 in the Department of Women and Child Development (DWCD), under the chairmanship of the Minister for Human Resource Development. After detailed deliberations the Council recognized the need for addressing the problem of malnutrition by adopting a mission mode approach and directed DWCD to prepare a Concept Paper on National Nutrition Mission. The concept paper has been prepared, but follow-up action is tardy and the problem persists. This is mainly because in the Government, nutrition has become the baby of the DWCD, whereas what is needed is a well-orchestrated convergence between various departments by pledging commitment and funds to issues related to nutrition in every department.

In the meantime, the food and nutrition scenario is changing and some rethinking is needed to address issues such as the consequences of the above-cited dual burden, changing lifestyles and consequently requirement of some nutrients; paradigm shift for judging poverty line; programme optimization and many others.

A symposium on the National Nutrition Policy was organized recently to discuss the existing and emerging nutrition problems, taking note of experiences in the past and also to discuss some essential elements which have to be addressed in the Nutrition Policy.

C. Gopalan (Nutrition Foundation of India (NFI), New Delhi) welcomed the delegates and expressed his concern that the success with regard to macroeconomic policies is not reflected in improvement in nutrition status of the poor. He stressed the need for a food-based approach where attention is paid to the quality of diet in terms of micronutrients content as well as their availability (absorption), and not just calories. While synthetic nutrients have a role in the treatment of nutrient deficiencies, they cannot become part of the public health programme, except in certain conditions like prevention of iron deficiency (anaemia) and iodine deficiency disorders. Supplementary feeding programmes have a place but they have to be supported by nutrition education of the community, so that preventing malnutrition becomes a people's movement.

M. S. Swaminathan (M. S. Swaminathan Research Foundation (MSSRF), Chennai) inaugurated the conference. He paid tribute to Gopalan who will be turning 90 this year, for his 'over six decades of service to nutrition science and security'. Speaking of nutrition orientation to our food production policies, Swaminathan suggested setting up public distribution facilities in the NREGS sites and mainstreaming nutritional dimension in the National Horticulture Mission, which has been allocated a large sum of money. Huge potential exists for promoting production of nutrient-dense vegetables and fruits, enhancing the productivity of nutritious dry-land crops like millets and pulses, where there is gap of 300% between actual productivity and potential, and increasing the production of rice and wheat by adopting high-yielding varieties. Genetic breeding methods have yielded good results in augmenting the micronutrient content of food, e.g. orange-fleshed sweet potato rich in beta carotene (vitamin A). India has developed iron-rich rice, zinc-rich wheat and low-phytate maize. They have to be promoted after suitable safety trials. Lessons need to be drawn from traditional wisdom. With a suitable blend of traditional and new technologies, evergreen agriculture can

be adopted. He also pointed to the need for promoting animal husbandry and off-farm skills for livelihood.

Pronab Sen (National Statistical Commission) spoke on 'Issues in defining the poverty line and their implications for the National Nutrition Policy'. Poverty line is a metric for assessing absolute economic deprivation. He suggested that it should be defined in terms of money value rather than energy deficiency, or any other desirable physical unit. This is apparent from the fact that in India, in the last few years, there is a mismatch between nutrition status and nutrient intake. While per capita calorie and protein intake has gone down, the proportion of people with malnutrition has not increased. In fact, the situation has improved marginally. Also, there is no evidence that under-nutrition is confined to the poorest classes. The National Nutrition Policy should not be based on the below poverty line households alone. This might question the present policy of targeted public distribution system (PDS).

Two other issues which need to be considered for a revised National Nutrition Policy are: changes in recommendations for nutrient requirement based on new evidence, and approaches for preventing over-nutrition, besides under nutrition. B. Sivakumar (formerly at the National Institute of Nutrition (NIN), Hyderabad) presented with personal inputs, the paper of B. S. Narasinga Rao (also formerly at NIN). Nutrients where fresh look for requirements is needed are: calories (downward revision recommended), proteins (look at quality), fat (quality in terms of balance of fatty acids) calcium and folate (upward revision recommended). With the increasing sedentary lifestyles even among the rural population, downward revision of calories has a bearing on the issue of over weight and obesity. Along with diet, adequate exercise is also needed. Deficiencies of zinc and vitamin B12 in Indians and folate, B12 ratio also need to be examined in view of recent evidence.

Several speakers addressed the issue of policies and programmes for delivering nutrition. ICDS is internationally one of the biggest programmes where nutrition improvement is one of the expectations. However, this programme which has now been almost universalized, has not helped to improve the nutrition status of children. Food supplements, though important, are only one of the compo-

nents of the ICDS. Inability to reach out to children under two years, and lack of focused nutrition and health education to mothers were pointed out as bottlenecks by N. C. Saxena (formerly with the Planning Commission). State resources should address the other components of the ICDS such as mothers' education, immunization and convergence with health as well. Appropriate infant and child feeding is the key to addressing under-nutrition in infancy. Here the question is not of poverty, but of ignorance. Initiation of breast feeding from day one (within an hour of child birth), exclusive breast feeding for the first six months and adequate complementary feeding after 6 months have to be promoted through behaviour change communication using all channels. A strong case for right infant and child feeding practices was made by Shanti Ghosh (an eminent octogenarian paediatrician).

Apart from food-based strategies for improving micronutrient status, micronutrient supplementation and food fortification are the other options. The latter holds promise if judiciously implemented, so that the food chain does not get burdened with micronutrients which primarily end up in the plate of the rich through processed foods. B. Sesikaran (NIN) presented the work done on fortification of salt with iron alone and in combination with iodine, in a paper co-authored by S. Ranganathan (formerly at NIN). Reduction in goitre through iodized salt is a success story which was transiently sabotaged through removal of ban on non-iodized salt. NIN has developed iodine and iron, double fortified salt (DFS). A simple kit to monitor these nutrients in salt has also been developed. DFS has been cleared for safety, stability, etc. and three private firms and one public sector undertaking have taken the technology. DFS should be made available through the PDS at subsidized cost for wider outreach.

The case of micronutrients supplementation was examined through meta-analysis of numerous studies by H. P. S. Sachdev (Sitaram Bharati Institute of Science and Research, New Delhi). Based on intervention-related evidence on biological consequences of micronutrient deficiencies, his recommendations were: confine vitamin A supplements to the 6 months to 6 years age group in high prevalence area and phase it out slowly. There is no justification for including the

younger age group. Salt fortification for iodine should continue and use of iodized salt should be universalized. Iron folic acid supplementation should continue with better programme implementation. It may bring about only 50% reduction in anaemia, and other strategies need to be worked out. Efficacy of double-fortified salt needs to be studied. Zinc should be routinely prescribed for an episode of acute diarrhoea. Dietary and fortification approaches for improving zinc status have to be researched. While there is a knowledge gap on the efficacy of supplementation with other nutrients like B-vitamin and vitamin D, there is no justification for multi-micronutrient supplementation.

One of the least appreciated components in nutrition is nutrition monitoring and surveillance. While the former assesses the existing situation, the latter has the power of predicting impending problems. The National Nutrition Monitoring Bureau under NIN has been operating since over three decades, but unfortunately it continues to be confined to ten states and is operating in project mode. A strategy for nutrition surveillance has also been developed by NIN. Prema Ramachandaran (NFI) presented a paper by K. Ramachandaran (formerly at the All India Institute of Medical Sciences), with a personal touch, and made a strong case for a 'well coordinated and integrated nutrition monitoring and surveillance system for formulating a realistic national nutrition policy and planning a comprehensive food and nutrition-related action programme'. Components of such a monitoring and surveillance system were also described.

Graduates of food and nutrition from almost 400 home science colleges in India are an underutilized human resource. According to Subadhra Seshadri (formerly at the MS University of Baroda), they need to assimilate facts and experiences from other disciplines and integrate them into their own agenda of training and education. Development of appropriate teaching material and messages for bringing about a behavioural change is needed. Education has to be at all levels from policy makers to the community. She narrated the experiences of MS University in prevention of anaemia.

The symposium covered two case studies. Sanjay Nandan (Midday Meal Programme, Gujarat) described the successful working of the MDM programme in Gu-

jarat, thanks to political and administrative commitment, and public-private-NGO partnership. MDM has had good impact on improving school attendance. Mahtab S. Bamji (Dangoria Charitable Trust, Hyderabad) discussed the experience of her organization in developing a strategy for village-level nutrition security with community participation in the villages of Medak District, Andhra Pradesh. The model emphasizes convergence of health, sanitation and eco-friendly agriculture/horticulture. She pleaded for a bottom-up approach through awareness generation in the community and developing strategies for access at affordable cost, rather than top-down planning and thrusting programmes. The MDM programme offers an opportunity to integrate nutrition education in schools and for promotion of micronutrient-dense vegetables.

Kamala Krishnaswamy (formerly at the NIN) in a comprehensive paper, discussed the infrastructure requirements for a sound and effective nutrition policy which should encompass food (agriculture), health, sanitation, education, delivery systems and many other areas. For these entire components, infrastructure has to be strengthened in terms of human and material resource, starting with nutrition education in professional colleges (medical, agriculture, home science and others); research at basic biochemical/molecular level, clinical and community studies; programme implementation at the field level and wherewithal for monitoring and surveillance. The scope of integrating nutrition in the medical curriculum was covered in a paper by Anura Kurpad (St. John's National Academy of Health Sciences, Bangalore) ably presented by Sarath Gopalan (NFI). In their opinion, since the undergraduate medical curriculum is overburdened, there is no scope for nutrition as a separate subject in the medical curriculum. Nutrition should be integrated into each subject – medicine, surgery, etc. The paper offered some suggestions regarding how nutrition teaching can be strengthened both at the level of patient care and community health. Unfortunately the important issue of integrating nutrition in the agriculture curriculum was not discussed in this symposium.

Practical steps for addressing the escalation of chronic degenerative diseases in the National Nutrition Policy were suggested by Srinath Reddy (Public Health

Foundation of India; AIIMS, New Delhi). Cardiovascular diseases are assuming epidemic proportion. He provided quantitative evidence of what it means to the nation in terms of loss of material and human resource, and the role that diet, particularly fruits and vegetables, can play in mitigating it. A strong case for integrating nutrition into health and development programmes through public-private partnership and awareness generation was made. The task according to him is to 'telescope the transition from under or over nutrition to appropriate nutrition; adoption of life-style approach with special focus on adolescents and children; use policy and education as complementary interventions to impact on populations and individuals'.

India is a greying society, and the question of health of the elderly to enable them to lead a productive life has become important. Kalyan Bagchi, another octogenarian nutritionist (formerly at WHO, Geneva) discussed some of the

biological and health problems associated with ageing, and how health and nutritional well-being of the elderly can be promoted through proper meals.

Ramesh Bhat (Centre for Science, Society and Culture, Hyderabad) spoke about new policy and programme initiatives needed to ensure food safety in India. Apart from the health of the people of India, a sound policy for food safety also helps India's export potential. Important elements of food safety policy include transparency, stakeholder involvement, enhanced coordination, utilization of science, avoiding conflict of interests between promotions of products and monitoring of safety.

The symposium pointed to the need for revision of the National Nutrition Policy, and suggested important elements for inclusion, but did not specifically provide prescription for its implementation. In the author's opinion there is need for convergence between the thinking and initiatives of scientists, policy mak-

ers and administrators. Institutions like NFI, MSSRF, etc. in the NGO sector need to work in consort with Government institutions like NIN, home science colleges, agriculture and medical institutions and government departments. Currently, parallel initiatives are being forged. Time has come to walk the talk.

1. National Nutrition Monitoring Bureau, Report, 2005-06. National Institute of Nutrition, Indian Council of Medical Research, Hyderabad.
2. Singh, V. and Christian, P., *Sight and Life Magazine*, 2008, vol. 1, pp. 1-21; <http://www.nfhsindia.org>
3. The World Bank, Report, 2006.
4. Barker, D. J. P., *Curr. Opin. Obstet. Gynecol.*, 1993, 3, 200-206.

**Mahtab S. Bamji\***, Dangoria Charitable Trust, Hyderabad 500 020, India; **Prema Ramachandran**, Nutrition Foundation of India, New Delhi 110 016, India.  
\*e-mail: msbamji@gmail.com

## MEETING REPORT

### International Biology Olympiad\*

This year India hosted the prestigious 19th International Biology Olympiad (IBO). The inauguration took place at the Grand Intercontinental, Mumbai on 14 July 2008. Students from 55 countries across the globe participated in the eight-day programme. The mega event was organized by the Homi Bhabha Centre for Science Education (HBCSE), Tata Institute of Fundamental Research, supported by the Department of Atomic Energy, the Ministry of Human Resource Development and the Department of Science & Technology, Govt of India.

Amongst the 55 countries that participated, Italy was this year's new entrant. More than 200 students, 200 team leaders, jury members and scientific observers participated in the event. A National Academic Committee chaired by S. K. Apte (BARC, Mumbai), consisting of some of the leading biologists and biology educationists of the country, has been involved in designing theoretical

and experimental tests of exceptional quality and high difficulty level.

The experimental tests included four practical tasks in plant sciences, animal sciences, biochemistry, cell biology and ethology. Both theoretical and experimental tests were held at HBCSE. The international jury sessions, in which the tests were deliberated upon and passed, were chaired by Anindya Sinha (National Institute of Advanced Studies, Bangalore).

After brainstorming sessions, which lasted for five days, the students were judged and the results delivered at the closing ceremony on 19 July 2008 at the Nehru Centre, Mumbai. At the outset, Rekha Vartak gave an overview of the preparation and execution of IBO. Apte gave a brief review on the formation of questions and tasks to be performed by the students. This was followed by short speeches made by T. Ramasami (DST, New Delhi) and Hans Moralís.

Anil Kakodkar (Atomic Energy Commission) and T. Ramasami gave away 138 medals to young, meritorious students. Subhrashis Guha Niyogi from the Indian team was awarded the gold medal, Siddharth Iyengar and Gopanandan Parthasarathy bagged the silver medal and

Sachit Daniel was awarded the bronze medal. The top three gold medals were given away to students from USA, China and South Korea.

Kakodkar, stressing on the importance of these olympiads, mentioned that IBO is an important activity in India and it is a meeting of cultures, development of new bonds, running a healthy competition and mobilization of the younger community to make the world a better place to live in.

At the end of the programme, the IBO cup was passed on by Arvind Kumar to the Chair, 20th IBO, Japan, where the Biology Olympiad will take place next year.

The 19th IBO, though focused on academics, was a festive occasion, including special tours to TIFR, Nehru Science Centre, Nehru Planetarium and Discovery of India Exhibition and a 'village fair' at the HBCSE. A newsletter was brought out by the HBCSE each day during the event. India's culture including classical and folk dances was showcased at its opening and closing ceremonies.

**Parul R. Sheth** (*S. Ramaseshan Fellow*), E-705/706 Kalpnagiri, Vaishali Nagar, Mulund (West), Mumbai 400 080, India.  
e-mail: parulrsheth@gmail.com

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