भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन नदी विकास एवं गंगा संरक्षण विभाग
केंद्रीय जल आयोग
जल प्रणाली अभियांत्रिकी निदेशालय

सत्यमेव जयते

Government of India
Ministry of Jal Shakti
Dept. of Water Resources, RD&GR
Central Water Commission
Water System Engineering Directorate

विषय: समाचार पत्रों की कटिंग का प्रस्तुतीकरण-08-अक्टूबर-2020

जल संसाधन विकास एवं सम्बद्ध विषयों से संबन्धित समाचार पत्रों की कटिंग को केंद्रीय जल आयोग के अध्यक्ष के अवलोकन के लिए संलग्न किया गया है. इसकी साफ्ट कापी केंद्रीय जल आयोग की वेबसाइट पर भी अपलोड की जाएगी.

संलग्नक: उपरोक्त

(-/sd)

सहायक निदेशक

उप निदेशक(-/sd)

निदेशक (-/sd)

सेवा में

अध्यक्ष, केंद्रीय जल आयोग, नई दिल्ली

जानकारी हेतु: सभी संबन्धित केंद्रीय जल आयोग की वेबसाइट http://cwc.gov.in/news-clipping परदेखें

The Hindu 08-October-2020

Playing catch up in flood forecasting technology

India needs a technically capable workforce that can master ensemble weather and flood forecast models

J. HARSHA

Have you ever wondered how a local agency makes a decision if a flood forecast merely uses the words "Rising" or "Falling" above a water level at a river point? Especially when the time available to act is just 24 hours, there is no idea of the area of inundation, its depth, and when the accuracy of the forecast decreases at 24 hours and beyond?

There are many times this happens in India during flood events, when the end users (district administration, municipalities and disaster management authorities) receive such forecasts and have to act quickly. These compelling scenarios are often experienced across most flood forecast river points, examples readers will be familiar with – in Assam, Bihar, Karnataka, Kerala or Tamil Nadu.

Compare this with another form of flood forecast (known as the "Ensemble forecast") that provides a lead time of 7-10 days ahead, with probabilities assigned to different scenarios of water levels and regions of inundation. An example of the probabilities ahead could be something like this: chances of the water level exceeding the danger level is 80%, with likely inundation of a village nearby at 20%. The "Ensemble flood forecast" certainly helps local administrations with better decision-making and in being better prepared than in a deterministic flood forecast.

The United States, the European Union and Japan have already shifted towards "Ensemble flood forecasting" alongwith "Inundation modelling". India has only recently shifted towards "Deterministic forecast" (i.e. "Rising" or "Falling" type forecast per model run).

The shortcomings with Indian flood forecasting are glaring.

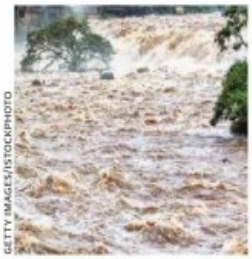
A case of multiple agencies

The India Meteorological Department (IMD) issues meteorological or weather forecasts while the Central Water Commission (CWC) issues flood forecasts at various river points. The end-user agencies are disaster management authorities and local administrations.

Therefore, the advancement of flood forecasting depends on how quickly rainfall is estimated and forecast by the IMD and how quickly the CWC integrates the rainfall forecast (also known as Quantitative Precipitation Forecast or QPF) with flood forecast. It also is linked to how fast the CWC disseminates this data to end user agencies.

Thus, the length of time from issuance of the forecast and occurrence of a flood event termed as "lead time" is the most crucial aspect of any flood forecast to enable risk-based decision-making and undertake cost-effective rescue missions by end user agencies.

Technology plays a part in increasing lead time. Reports suggest that the IMD has about 35 advanced Doppler weather radars to help it with weather forecasting. Compared to point scale rainfall data from rain gauges, Doppler weather radars can measure the likely rainfall directly (known as Quantitative Precipitation Estimation or QPE) from the cloud reflectivity over a large area; thus the lead time can be extended by up to three days.



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But the advantage of advanced technology becomes infructuous because most flood forecasts at several river points across India are based on outdated statistical methods (of the type gauge-to-gauge correlation and multiple coaxial correlations) that enable a lead time of less than 24 hours. This is contrary to the perception that India's flood forecast is driven by Google's most advanced Artificial Intelligence (AI) techniques!

These statistical methods fail to capture the hydrological response of river basins between a base station and a forecast station. They cannot be coupled with QPF too.

Google AI has adopted the hydrological data and forecast models derived for diverse river basins across the world for training AI to issue flood alerts in India. This bypasses the data deficiencies and shortcomings of forecasts based on statistical methods.

Not uniform across India

A study by the National Institute of Technology, Warangal, Telangana shows that it is only recently that India has moved to using hydrological (or simply rainfall-runoff models) capable of being coupled with QPF. So, a lead time of three days is sporadic in India, and at select river points.

Just as the CWC's technological gap limits the IMD's technological advancement, the technological limitations of the IMD can also render any advanced infrastructure deployed by CWC infructuous. Here is another example. The United States which is estimated to have a land area thrice that of India, has about 160 next generation S-band Doppler weather radars (NEXRAD) with a range of 250-300 km. India will need at least an 80-100 S-band dense radar network to cover its entire territory for accurate QPF. Else, the limitations of altitude, range, band, density of radars and its extensive maintenance enlarge the forecast error in QPF which would ultimately reflect in the CWC's flood forecast. Conspicuously, the error margin is always away from the public gaze.

Therefore, outdated technologies and a lack of technological parity between multiple agencies and their poor water governance decrease crucial lead time. Forecasting errors increase and the burden of interpretation shifts to hapless end user agencies. The outcome is an increase in flood risk and disaster.

Ensemble technology

Global weather phenomenon is chaotic. For instance theoretically, "the flap of a butterfly's wings in Chennai can create a Tornado in Tokyo" according to MIT's Edward Lorenz. In simple terms and scientifically, any small change in the initial conditions of a weather model results in an output that is completely unexpected. Therefore, beyond a lead time of three days, a deterministic forecast becomes less accurate.

The developed world has shifted from deterministic forecasting towards ensemble weather models that measure uncertainty by causing perturbations in initial conditions, reflecting the different states of the chaotic atmosphere. Probabilities are then computed for different flood events, with a lead time beyond 10 days.

India has a long way to go before mastering ensemble model-based flood forecasting.

Although, the IMD has begun testing and using ensemble models for weather forecast through its 6.8 peta flops supercomputers ("Pratyush" and "Mihir"), the forecasting agency has still to catch up with advanced technology and achieve technological parity with the IMD in order to couple ensemble forecasts to its hydrological models. It has to modernise not only the telemetry infrastructure but also raise technological compatibility with river basin-specific hydrological, hydrodynamic and inundation modelling. To meet that objective, it needs a technically capable workforce that is well versed with ensemble models and capable of coupling the same with flood forecast models. It is only then that India can look forward to probabilistic-based flood forecasts with a lead time of more than seven to 10 days and which will place it on par with the developed world.

With integration between multiple flood forecasting agencies, end user agencies can receive probabilistic forecasts that will give them ample time to decide, react, prepare and undertake risk-based analysis and cost-effective rescue missions, reducing flood hazard across the length and breadth of India.

J. Harsha is Director, Central Water Commission, Government of India. The views expressed are personal

Deccan Chronicle 08-October-2020

Parts of TS receive rains

T.S.S. SIDDHARTH | DC
HYDERABAD, OCT. 7

Rain lashed parts of Telangana on Wednesday under the influence of a cyclonic circulation prevailing over Andhra Pradesh.

For Thursday, the Indian Meteorological Department has issued an orange warning for districts including Adilabad, Kumarambheem, Nirmal, Nizamabad, Mancherial, Jagityal, Rajannasirisilla, Peddapalli, Karimnagar, Siddipet, Jangaon, J. Bhupalapally, Mulugu, Bhadradri Kothagudem, Warangal (Urban and Rural), Mahabubabad, Khammam and Suryapet. The state government has asked its line departments – municipal, traffic and others – to be prepared.

In the city, however, rain was recorded only in Kukatpally, which received 3.5 mm of rainfall.

Telangana Today 08-October-2020

Cruising towards Blue Revolution

Round the year availability of water is generating new hopes for Telangana's fisheries and aquaculture sector

PITTALA RAVINDER

While the Union government replaced the much-coveted Blue Revolution Scheme (BRS) with the Prime Minister Matsya Sampada Yojana (PMMSY), Telangana recently undertook a herculean task of attaining the high-profile 'Blue Revolution', aiming to achieve all-round development in aquaculture and fisheries sectors.

The PMMSY scheme came into existence as part of 'Atmanirbhar Bharat', while Telangana's 'Blue Revolution' was orchestrated with the augmentation of water resources from the re-designed Kaleshwaram Lift Irrigation scheme. It may be mentioned that the centrally-sponsored BRS was being implemented during the last five consecutive years (FY15 to FY19), by sharing contributions from the States concerned. This scheme was receiving good response from the beneficiaries across the country, yet it was shut and a new scheme – PMMSY – with similar objectives, started.

Inland Fisheries

Unlike never before, the contribution of inland fisheries in total fish production has been increasing across the world following the diminishing inputs from the marine fisheries sector due to adverse biodiversity conditions, ecological imbalances, etc. India, the second largest fish producing country in the world, is also registering a falling trend from marine and an escalating trend from the inland sector. The contribution of the marine sector was 73% against the inland production inputs of a meagre 27% way back in 1956-57 and the figures almost reversed by 2018-19 with the marine sector dwindling to a mere 29% and the inland sector contributing a whopping 71%.

The most important factor for the multifold increase in fish production from inland fisheries is technology-based cultured fisheries. The share of the cultured fisheries through modern aquaculture methods during 2018-19 was 53% and the rest came from traditional captured systems.

TRS govt has initiated free distribution of fish seed and implemented the 'Integrated Fisheries Development Scheme' with an outlay of Rs 1,000 crore

With the prestigious Kaleshwaram irrigation project and its related reservoirs and distributaries taking shape fast, Telangana has been witnessing a sea change in water availability and irrigation resources, generating new hopes for the future of fisheries and aquaculture.

Despite having no coastline and being geographically landlocked, Telangana is the third largest inland water resources territory in the country and is blessed with abundant aquatic possessions to develop the traditional fisheries sector as well as technology-based state-of-the-art aquaculture methods simultaneously. This will also create massive employment and earn good foreign exchange through fishery exports.

Owing to the lackadaisical attitude of the erstwhile administrators of the combined State, the development of the fisheries sector in Telangana was confined only to the customary activity by a few communities.

The exploitable aquatic resources for the development of fisheries and its allied sectors in Telangana, particularly in the wake of Pranahita-Godavari river waters through Kaleshwaram re-designed lift irrigation projects, have been amplified from the earlier 5.72 lakh hectares of usable water spread areas to around 6.94 lakh hectares now.

Telangana's Advantages

Interestingly, the aquatic resources generated from Pranahita-Godavari river basins not only enabled construction of several large and medium reservoirs for water storage but also ensured year-long full tank level water storages into the existing tanks in the catchment areas covering as many as 19 of the 33 districts of the State.

'Mission Kakatiya' removed sludge from whopping 45,000-odd tanks enhancing the water storage capacities to around 20% on average. The ongoing Palamuru-Rangareddy lift irrigation projects being taken up across the river Krishna would also create similar water resources across this river basin, more particularly in South Telangana.

The 'Blue Revolution' is justified with the creation of the required water resources. Accomplishing the exceptional task of 'Blue Revolution' may not be trouble-free if we evaluate the prevailing circumstances and ground realities within fisheries and aquaculture sectors in Telangana which need to be refurbished thoroughly. However, given the bountiful usable water resources to develop fisheries and aquaculture, fish production and productivity, fish seed production and rearing, upgradation of technology and adopting modern methods in fishing through aquaculture, fish processing and value addition, creating local marketing network and exporting fish products, etc, must be accorded priority.

Many problems undoubtedly accumulated during the co-existence of combined Statehood regime. The fisheries department has been reeling under inadequate employees' strength. Also, though the Telangana fisheries sector is supported with a strong network of around 4,000 cooperative societies with about 3.35 lakh registered members, most of them are confined to traditional fishing methods.

TRS Government's Push

The present TRS government has been making efforts to rectify the laxities and the results are emerging. Evidently, the annual fish production during 2014 — the State formation year — was 2.46 lakh tonnes. This increased to around 3.40 lakh tonnes in FY19-20, registering a steady growth of about one lakh tonnes in just five years of Telangana's existence!

The State government initiated the free distribution of fish seed through the fishermen cooperative societies during the last five years and implemented the 'Integrated Fisheries Development Scheme' with an outlay of Rs 1,000 crore, for infrastructure development of the sector all the way through cooperatives.

With favourable circumstances, including renovation of tanks through Mission Kakatiya, sufficient resources to ensure year-long availability of water to refill the tanks, lakhs of enthusiastic and well-organised fishermen and women, around seven lakh hectares of sprawling water spread areas coupled with numerous upcoming reservoirs, hundreds of kilometres of the river Godavari back waters, and above all with the serious commitment of the State government, Telangana can cruise towards 'Blue Revolution'.

(The author founder president of Telangana Fisheries Society and a member of World Aquaculture Society and Asian Fisheries Society)

The Statesman 08-October-2020

A way to protect the Sunderbans

SNS

TARUN KUMAR CHOUDHURY

The storm 'Amphan' had devastated the Sunderbans in May 2020 causing enormous damage to lives and livelihoods of the hapless people settled there. As per estimates of the State government, as reported in media, 28 lakh houses, 17 lakh hectares of agriculture land, 21 lakh domesticated animals and 8,000 board were affected. The storm led to problems with supply of drinking water, damaged roads, forests, power supply lines, education and health infrastructure and activities of some 26,000 MSM entrepreneurs. The genesis of destruction was mainly floods caused through breaches in 245 km of earthen river bunds and 36 km of sea bunds.

When storm 'Aila' struck the Sunderbans in 2009 and the government approached the Water Resources Section of the Civil Engineering Department of IIT, Kharagpur for suggestions to resolve the problem permanently, it was recommended to replace all earthen river bunds by breach-resistant, concrete-reinforced earthen embankments. On further request, the faculty, in collaboration with a field experienced alumnus, evolved the innovative 'Reinforced Earthen Embankment' technology using precast reinforced concrete material.

It is anchor-shaped, stands on three legs and has three arms protruding upwards. It weighs around 40 kg and was developed under the alumnus, during his tenure in Kolkata Port as River Training Engineer, while executing river projects like stabilisation of ship channels, arresting bank erosions etc.

The material, then named a Hexapod, was brought to public notice through a number of papers published in technical journals, the first one entitled "Use of Unconventional Materials in the construction of Nurpur Spur, River Hooghly," in Irrigation and Power Journal, Vol. 36 No.2 April 1979 issue and the last one titled "Reinforced Concrete Hexapod - an innovative Material for River & Shore Management" in Institution of Engineers (India) Journal , Vol.87, May 2006 issue that was awarded a prize.

The Hexapods had been extensively tested in the port's river corrective works and found very effective. As such, they are proven materials. The Oceanology Department of IIT tested it again in the laboratory to verify authenticity of claims regarding its efficacy as stated in the Journals. It was renamed 'Spider' because of its ability to be interconnected to form endless chains without any other aid. These chains are placed horizontally and vertically, with vacant spaces being filled with sand to form an impregnable concrete based wall inside the earthen embankments, and this makes them breach resistant. Additionally, 6G galvanised iron wires can be put through the holes in their legs to make these cluster of Spiders more resistant.

IIT's Water Resources Wing intimated the government about the innovative Reinforced Earthen Embankment technology with a request to test it in pilot projects at bund sites affected by Storm 'Aila'. Unfortunately, after initial enthusiasm, the government response was lukewarm.

We need to understand that only a breach-resistant, concrete-based wall inside the earthen embankment can protect Sunderbans from the fury of storms like 'Aila' and 'Amphan'. Moreover, the benefits from construction of breach-resistant embankments are manifold. These are: freedom from annual ritual of floods to enable islanders to plan their livelihood; saving of flood relief expenditure; retention of entire catchment rain to resolve drinking and agriculture water problems; less migration of rural labour to urban centres of different states in search of employment, and finally, freedom of villagers from insecure feelings and sleepless nights during the monsoon.

It may be mentioned that if Reinforced Earthen Embankments are used all over the country there would be further benefits, apart from those listed above. These are: entire catchment rain water harvesting without loss; pollution-free rivers including the Ganga; arrest of land silt going into the rivers with rainwater run-off and thereby protecting river drafts with least maintenance dredging, for benefit of Inland Water Transport system, and saving of rivers from being dried up due to annual land silt deposit through breaches in the bunds in monsoon by rain water run off.

Incidentally, the rural populace can be employed under the Mahatma Gandhi rural employment scheme to construct and maintain their own protection bunds. This will make the technology cost effective. It will be a misfortune if despite availability of low-cost, rural employment-oriented indigenous technology, the 245 km of river bunds and 36 km of sea bunds, reportedly damaged by 'Amphan' are not repaired properly to make them breach resistant and to save the Sunderbans. Nature gave a warning call in 2009 through 'Aila' and a wake-up call in 2020 through 'Amphan'.

The writer is an IIT alumnus and a former River Training Engineer at Kolkata Port.

Rajasthan Patrika 08-October-2020

लूनी बांध छलकने के बाद भी प्यासी रह गई लूनी नदी

रायपुर मारवाड़. (पाली). उपखण्ड़ क्षेत्र का प्रमुख लूनी बांध इस बार भी छलका, लेकिन छलकने में हुई देरी से लूनी नदी प्यासी रह गई। इधर, मानसून भी अलविदा कर गया। ऐसे में दो दर्जन गांवों के किसान नदी के ऊ फान से चलने के बाद कुएं रिचार्ज होने की उम्मीद लगाए बैठे थे। इस उम्मीद पर पानी फिर गया हैं। इस बार कुएं रिचार्ज नहीं हो पाने से किसानों के माथे पर चिंता की लकीरें खिंच गई हैं।