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## Goa Ground Water Policy, 2015

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Department of Water Resources  
Office of the Chief Engineer, Water Resources

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**Notification**

9/3/CE-WRD/EO/14-15/04

Sanction of Government is hereby conveyed for adoption of the Ground Water Policy-2015. The Policy was adopted vide VIIIth Cabinet Meeting of the Council of Ministers held on 13-3-2015. The Policy was also laid on the floor of the Goa Legislative Assembly on 24-3-2015.

By order and in the name of the Governor of Goa.

*S. T. Nadkarni*, Chief Engineer & ex officio  
Additional Secretary (WR).

Porvorim, 1st April, 2015.

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**Goa Ground Water Policy**

*Introduction.*— Water is the most essential resource for maintaining life on earth, a resource, which on one hand is extravagantly used by human beings and on the other hand, its per capita availability is decreasing day by day. Initially the uses of water were limited to fewer wants of mankind like drinking, cooking, bathing, washing, etc. As technology unfolded, so also the uses of water, which became varied. Domestic uses were expanded to cooling, air-conditioning, heating, sanitary purpose, watering lawns and gardens, swimming pools, etc. Public uses encompass requirements in hospitals, educational institutions, hostels, prisons, public parks, fire-fighting, commercial cum office buildings, hotels, laundries, shopping centres, bus, railway terminals, etc.

Water is found in atmosphere, on earth's surface and within earth's crust. In atmosphere, water is found in the lowermost layer, the troposphere, either in vaporous or solid state or in the form of liquid droplet. Surface water is found in liquid or solid state. within earth's crust, i.e. within the lithosphere, water is found in vaporous, liquid or solid state.

Surface water, underground water and the water contained in the tissues of all animals, plants (biosphere) together compose the water envelope of the earth usually called the hydrosphere.

Atmospheric, surface and underground waters are closely interconnected and are found in continuous motion known as hydrologic or water cycle. Of the total quantum of water on earth, 96.50% is saline. Of the balance which is the fresh water, 68.70% is in glaciers and polar caps, 30.10% is available as ground water and only 0.30% is available in rivers and lakes as surface water. Since about 30% of fresh water occurs as ground water, the study of availability and movement of water under the earth's crust is of paramount interest to mankind. The science of the same is known as hydrogeology.

A number of hydrophysical zones have been identified according to the phase transition of water and certain characteristic changes in its structure. The zones have been identified as zone of aeration, frozen zone of earth's crust, zone of saturation, zone of over-densified water fluid, zone of liquid-plastic water solution of silicates and aluminosilicates, zone of dissociated water molecules.

The State of Goa has in general two types of aquifers, the top semi or unconfined aquifer which is normally the lateritic or similar rock and the deep confined aquifer which are the faults or fissures in the parent rock. The ground water resources of the State were estimated by Central Ground Water Board and the dynamic water resources have been estimated as 132.75 Million Cubic meters. The utilization of the ground water resources is estimated as 43.83 Million Cubic meters which is 33% of the stock, considered safe.

Goa is one of the foremost States to implement the Goa Ground Water Regulation Act, 2002 (Goa Act 1 of 2002). Government has already notified the Ground Water Officers for North and South districts of Goa and also the Ground Water Cell under the chairmanship of

Chief Engineer, WRD. Government of Goa has also made rules under the Act. Government had notified the urban areas, industrial areas and coastal areas as scheduled areas under the Act in 2007. However in 2012, whole of Goa has been notified as the scheduled area. Government has also made rules under the Act to charge rates for drawal and transportation of ground water under different uses and rules to register all the drilling companies who drill bore wells in the State.

Though the overall ground water utilization is safe, there are some localized stressed areas as follows:—

- (i) Industrial Areas
- (ii) Coastal areas
- (iii) Urban areas
- (iv) Mining areas.

Hence the need of a comprehensive ground water policy which aims at development of ground water on a sustainable basis, regulating it and also managing it in a professional manner to prevent its pollution and degradation.

*Ground Water Policy.*—(1) All ground water structures in the State will be registered as required under section 5 of the Goa Ground Water Regulation Act, 2002 (GGWRA). To educate the citizens about the importance of the judicious use of ground water, the Ground Water Officers (GWO) designated under GGWRA will hold awareness camps/meetings at the level of Village Panchayats. During such awareness camps, the GWO will also educate the citizens on the mandatory provisions of GGWRA on registration of existing wells and the obtaining of prior approvals before sinking a new well.

(2) To correctly monitor and bill the well owners for the ground water withdrawal, especially for industrial, commercial and mining uses, all existing wells will be metered at the earliest in exercise of the powers granted to GWO, under section 13(4) of GGWRA. Metering will also be an essential condition for granting

permission to sink a new well under section (5) of GGWRA. Pumps, especially those for commercial, industrial and mining uses will be installed in wells in such a manner as to completely prevent any withdrawal by by-passing the meters. Owners will provide metres for the wells at their own cost which will be checked periodically for their condition by the GWO's.

(3) Within a definite time frame, GWOs will bring under total registration all tankers and other carriers engaged in transportation of ground water, which is a mandatory requirement of section (6) of GGWRA. For ready identification, all registered water tankers and carriers will be provided passes under the signature of the GWO to be displayed on their wind shields. These passes will carry all relevant information of registration of the tankers. No water tankers or carriers will be allowed to ply unless they carry such passes. Law enforcement agencies, such as the police and the Road Transport Officers (RTO) will be co-opted to deter violation of these provisions by empowering them to impound the water carriers operating in violation of these provisions. GWOs will also act proactively in preventing such violation by carrying out surprise checks. They will also register and assiduously pursue complaints in this regard to bring violators to book and thereby reaffirm that there is a cost to violation of these rules. Only an effective regime of enforcement can ensure substantial compliance with GGWRA and maximization of revenue realization.

(4) Experience gained in ground water regulation has shown the limitations of the conventional policing and other enforcement methods in ensuring compliance with GGWRA. Surveillance and tracking of violations of the law must not only be effective but be fool-proof but at the same time non-obstructive. Technological aids such as Geographical Positioning System (GPS) and software solutions offered by Information Technology (IT) shall be relied upon for keeping track of ground water extraction and transportation as already in use by mining companies to

eliminate malpractices. Solutions such as tanker-mounted GPS systems and electronic fencing (a software package) will be inducted into ground water regulation to check malpractices in ground water extraction and transportation and thereby prevent the consequent loss of revenue to the State.

(5) Quality of ground water, which is one of the criteria under section (5) (6) (4) of the GGWRA to be taken into consideration in granting or refusing to grant registration of an existing well or for permission to sink a new well, will be accorded high priority. Well owners shall get the quality of ground water tested bi-yearly, preferably in April and October. Such tests shall be carried out at approved water testing laboratories registered with the Water Resources Department (WRD). All the test parameters shall be within the prescribed limits stipulated in the relevant standards.

(6) Water Resources Department shall undertake the study for delineation of aquifers in the State with the properties of the same. This will help in studying the utilization pattern and granting of the permission in a more scientific manner.

(7) Periodical monitoring of the ground water levels shall be undertaken to demarcate the actual areas under stress. There are about 105 observation wells (65 open and 40 peizometers) of the Water Resources Department which are set up recently under HP-II Project of World Bank and another 50 wells of Central Ground Water Board. The data from the same shall be utilized for better management of the water resources in the State.

(8) For a proper regulation of ground water development and management, need-based micro-level estimation of ground water availability will be undertaken especially in stressed areas. Information gathered from such studies will be useful in declaring areas in the State as Water Scarcity and Over Exploited Areas as provided for under section (4) (2) & (3) of GGWRA.

(9) Stringent action should be taken for violators of the Ground Water Act. Periodical and continuous monitoring should be taken up by the Ground Water Officers and their authorized representatives to implement the Act in right spirit to protect the ground water resources for future generations.

(10) Proper arrangements should be made by mining companies for dewatering including metering of the same and the same should be shown to the Ground Water Officer before the withdrawals are made. Ground Water Officers should periodically monitor the withdrawals made by the mining companies and authenticate the same. Department should monitor the ground water levels in the mining belt. Peizometers or wells wherever necessary should be installed to record the levels in mining belt.

(11) Rain water harvesting and recharging of the ground water resources should be encouraged wherever feasible. Department should render assistance and guidance for such proposals.

(12) Water conservation measures like bandharas, inverted bandharas, percolation tanks, check dams, contour bunding, trenching, etc. should be encouraged and propagated wherever feasible.

(13) In canals or flow irrigation, conjunctive use of ground water along with surface water resources should be adopted to prevent wastage and conserve water.

(14) Training on modern scientific technologies and tools should be imparted and made available to the Ground Water Officers and managers for better visualization and decisions in ground water management.

(15) There is at present a multiplicity of authorities and bodies, such as the Department of Health, Municipal bodies, Village Panchayats, etc. which regulate the sinking of wells. Each of these agencies administers partial aspects of ground water regulation. Besides leaving

gaps in regulation, such diffusion and division of responsibility creates overlaps of jurisdiction and inconvenience to well owners. To avoid overlapping of jurisdictions and to bring about unity in regulation, proper co-ordination will be established between all government authorities and bodies.

(16) The Water Resources Department will co-ordinate its efforts with the Directorate of Health and the Goa State Pollution Control Board to ensure as extensive and effective monitoring of ground water quality as possible.

(17) All the bore wells will be drilled through registered bore well agencies registered with the Department as per the Act.

(18) Spring is a contribution of ground water to surface water regime. It is also called interflow. Inventories should be prepared by the Department of all the springs in the State. Phase-wise surveys should be incorporated to investigate the present state and position of

the springs, the quality of water being discharged and also the pollution aspect of the same. Attempts should be made systematically to rejuvenate the springs and improve the quality of water discharged. Department should prepare schemes for the same. Attempts should be made systematically to rejuvenate the springs and improve the quality of water discharge wherever needed.

(19) The charges towards ground water drawals and transportation for various uses will be reviewed every alternate year.

(20) In their recommendation at para 9.3 of the Master Plan for Madei/ Mandovi river basin, the Panel of Experts (POE) set up by the Government of Goa have urged the use of abandoned mining pits for water resources management. To give effect to this recommendation, wherever feasible, abandoned mining pits will not be refilled. Such pits will be used to serve as a means of ground water conservation and recharge.

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