

Towards a rational use of groundwater from agrowells under small tank systems of the Rajarata

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One of the most significant developments that has taken place at a very rapid pace in the Rajarata during the recent decade has been that of the construction of agrowells under the numerous small tanks.

According to recent estimates there are over 10,000 such agrowells scattered across the Anuradhapura district alone. Each of these agrowells can irrigate between 0.5 to 1.0 acres of land by lift irrigation. Growing of high-value cash crops during the dry season is a very profitable enterprise and this has helped to raise farmer incomes.

However, the main issue at stake today is how many agrowells can the whole of Rajarata region support, based on the present and future groundwater supply. It must be clearly borne in mind that the shallow ground water table that is being exploited by these agrowells is very limited in its quantity and is of a very ephemeral nature. If it is over exploited, it could lead to very disastrous consequences both environmentally and economically. Such a disastrous scenario should be avoided at all costs by taking appropriate timely interventions at this crucial phase of development.

It should be emphatically recognised that this shallow phreatic ground water is one of the most, if not the most precious natural resource of the Rajarata when compared with all the other resources such as land, soil vegetation, minerals, etc. and if this precious resource is not wisely and frugally exploited at this stage, then serious land degradation and desertification could set in.

Fortunately, the Rajarata has been spared of such irreversible disasters up to now, and we should take

meaningful steps from now on to prevent any such disaster overtaking us in the future.

Thanks to the basic research that was initiated at Maha Illupallama during the early nineteen fifties, and which has been now further refined and developed over the last five years by the International Irrigation Management Institute (IIMI) in collaboration with natural resources scientists of DOA at Maha Illupallama and the Geology Department of the University of Peradeniya, we now have a very good understanding of the nature of occurrence and the safely exploitable amount of ground water that could be extracted by these agrowells.

The importance of properly focused applied research is clearly borne out in the strategic basic information that is now available to us to chart a safe course for the future exploitation and utilisation of this very valuable ground water resource, which was hitherto not very clearly understood and characterised.

It would be an unforgivable tragedy if we do not take the necessary steps from now on to correct the indiscriminate use of this precious resource as is now taking place.

The foregoing recent field research has been able to show us that this shallow ground water supply occurs mainly within certain landscape positions of the small tank cascade systems that are distributed over the Rajarata landscape. It has been possible to identify and demarcate a total of 450 small tank cascades across the nine major river basins that make up the Rajarata. The nine river basins are the Kala Oya, Malwathu Oya, Moderagam Ara, Ma Oya, Yan Oya, Parangi Ara, Pankulam Ara, Mee Oya and Kodikkadi Ara.

The mean size of a small tank cascade is between 6 to 10 square miles; and within each small tank cas-

cade one finds between 6 to 8 small tanks of varying size which occur along the main valley of each cascade. The size of the tanks increases as one proceeds down along the main valley of each cascade.

The shallow ground water is mainly confined to a narrow belt along the main valley of each cascade and to a smaller extent along the side valleys. It could thus be observed that this shallow ground water is restricted to a definite landscape position within a cascade of small tanks and is not ubiquitous as commonly imagined.

The small tanks also help to recharge and augment this shallow ground water during the rainy Maha season, which in turn is available for exploitation during the dry Yala season.

To ascertain how many agrowells could be safely located within each cascade, a total of 50 sample cascades spread over 12 Divisional Secretariat Divisions were studied in greater detail. It was found, that depending on the hydrological endowment of each cascade, the optimum number of agrowells that could be safely tolerated within each cascade is between 30 to 140 depending on the size of the cascade. On the whole it was found that the upper limit of the total number of agrowells that could be safely accommodated within the foregoing 50 cascades was approximately 3,600.

The findings of this study could be reliably extrapolated to the remaining 400 cascades that make up the whole of the Rajarata. We could thus ascertain the total carrying capacity, or else, the maximum number of agrowells that could be safely permitted within all of these 400 cascades. It was also observed that among the 50 cascades that were studied in more detail, the number of present agrowells had already exceeded the upper critical limit in five of the cascades.

The red signal has therefore been already flashed, and time is now appropriate to take timely action to prevent any further expansion of agrowell construction in some areas. In sum it could be stated that one of the highest priority areas that should be immediately addressed from the standpoint of the conservation of a limited but highly valuable ground water resource, is that of the indiscriminate and haphazard development of agrowells that is being fostered and encouraged by different agencies in the North Central and North Western Provinces of the country - namely the Rajarata and Wanni.

There are well proven criteria and guidelines now available for determining the location as well as the density of agrowells in this hard metamorphic rock areas. These guidelines should be strictly enforced and adhered to avoid serious ecological and environmental disasters in these regions in the future.

It is, therefore, high time for the Provincial Planning Council of the North Central Province to step in and intervene to properly guide and control the future expansion of agrowell development in this region.

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