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STUDY ARTICLE ON FOG NET

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Abstract: The scope of this paper is to review the potential of the fog net to be a water source and the performance of the fog net to be a fog harvesting method. Fog net is a mesh with equal intervals used for the fog collection. The fog collection works which are done so far on the fog nets and efficiency based on the location and the type of material used in the fog net and this study includes the best location to place the fog net and the time required to install and procedure to store the gathered condensed fog water to put it in to effective use.

IndexTerms **- fog net, mesh, fog harvesting.**

INTRODUCTION:

The world is surrounded by 70% of water and the water crisis is major issue for the forthcoming years. Since the natural resource availability should be utilized properly and to leave the resources for the next generation. In order to recharge or use effectively the water the natural fog is a free source of fresh water which can be gathered with various methods like fog net. During the climatic changes it is observed due to the pollution made by the manmade disaster leads to the lack of potable water. It is right time to think for alternative ways to avoid the scarcity of water and it is predicated that the next war only for water which is inevitable. The people move towards from rural to urban area for livelihood since lack of drinking water and if available then the agricultural activities furnishes to their livelihood. Fog water availability disappears depending upon the global warming. By the way of Passive fog water collectors continues to be a major challenge for the fog water harvesting. Fog drip collection is a major challenge and to efficiently.

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Fog harvesting:

The method used to collect micro water droplets in the air known as fog and this type of collection is done for fog harvesting and this fog collection include various methods and the harvesting include the storing of fog water and usage of that water in the various human uses (Fig.1).

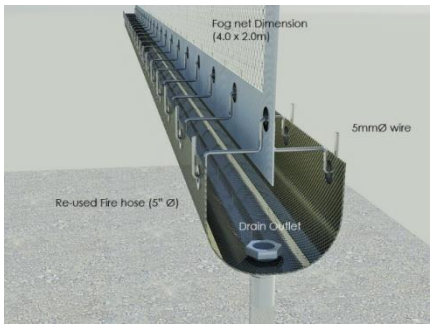

Fig.1: Fog water collection mechanism

Fog net:

The fog net is a innovative method to harvest fog in the hilly areas and deserts where minimal water supply is a tough and the fog net is a mesh type net which is used to collect water and this net will come with various materials.

Mechanism:

The working process in the fog net is to capture the fog and the mesh in the fog net will come contact to the fog and the fog gets deposited with the net and begin flow along the net and gets drained through the pipes provided through the outlet and gets stored in the storage or gets diverted through the pre-installed pipe lines (Fig.2).

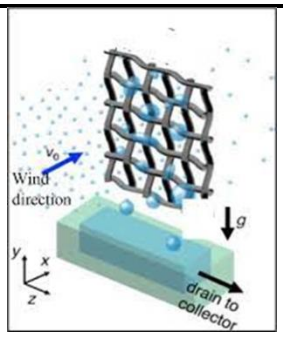

Fig.2: Fog net mechanism

Advantages of fog net:

- Does not require energy to operate.
- Reduces pressure on local water reservoirs in low water availability period.
- Atmospheric water is generally clean and does not contain any harmful micro-organisms and is readily used for irrigation purposes.
- Minimizes cost of transporting of water to an area which is hard to reach.

The Technology of Fog Net:

Fog collection technology is an innovative way for collecting fog droplets carried by the wind using a simple surface impaction procedure. A plastic mesh is stretched in front of the prevailing wind direction, intercepting portion of the fog droplets as the air flows through the mesh. On the mesh fabric, minute fog droplets merge and produce bigger water droplets, which flow down into an attached container. At chosen high areas facing the predominant wind direction, large fog collectors are built (Fig.3).

Fig 3: Fog net placing in hilly area

As near-saturated air travels through a plastic mesh during a fog phase, a percentage of the fog droplets are collected. The tiny fog droplets condense into bigger water droplets, which flow down the mesh cloth into a PVC gutter connected to the mesh. The collected water can then be gravity-fed to a sedimentation tank to settle any suspended particles before being discharged into a household water supply and/or irrigation system.

The collected water can then be gravity-fed to a sedimentation tank and/or a residential water supply and/or irrigation system. Polypropylene or polyethylene mesh with a shading coefficient of 35% is the most common mesh type utilized in different nations.

The mesh has a pore size of around 10 mm and is woven in a triangle pattern with a flat fiber about 1 mm broad and 0.1 mm thick. Water is generated by ten 1-mm wide ribbons than by ten 10-mm wide ribbons. Depending on how the fibers overlap, a double layer of mesh is usually employed to cover 70 percent of the collector's surface area. As the two layers move against one other, this enables run-off of the accumulated water.

An initial gathering of crucial geographical information, such as height, distance from the sea, relief, and slope direction, is used to determine a prospective project location. Once a viable project location has been selected, a feasibility assessment measuring daily fog-water collection must be conducted.

Conclusion:

1. Fog water may be a valuable source of fresh water for afforestation, gardening and also as a drinking water source for human consumption.
2. The main aim of this project is to increase the availability of clean water by making use of fog and clouds through the design of a system that can do the purpose reliably and at a reasonable cost.
3. By using fog net water could be collected for 1000 Litters per day.
4. The aloe Vera plant cultivated in drip irrigation by using fog net effectively increases the growth of plant which used for medicinal value.

References

1. Mussie Fessehaye, Sabah A.Abdul-Wahab, Michael J.Savage, Thomas Kohler, Tseggai Gherezghiher, Hans Hurni, 2014, Fog-water collection for community use, *Renewable and Sustainable Energy Reviews*, 29, 52-62.
2. S. Naveen[1], Dr. K. Chandramouli[2] , J. Sree Naga Chaitanya[3],2021, Study on Smog Eating Buildings, International Journal of All Research Education and Scientific Methods , 9,3284-3289.
3. Olivier J, 2004, Fog harvesting: an alternative source of water on the west coast of South Africa, *Geo Journal*, **61**, 203–14.
4. Vijaya Kumar.D, Chandramouli.K, & Kartheek Babu.K, 2018, Study of Present Environmental Conditions at National Level, *North Asian International Research Journal of Sciences, Engineering & I.T*, **4**, 10, 1-4.
5. Dawson TE, 1998, Fog in the California redwood forest: ecosystem inputs and use by plants, *Oecologia*, **117**, 476–85.
6. Pinto R, Larrain H, Cereceda P, Lazaro P, Osses P, Schemenauer RS, 2001, Monitoring Fog-Vegetation Communities at a Fog Site in Alto Patache, South of Iquique, Northern Chile, during "El Nino" and "La Nina" events (1997–2000), *Proceedings of the 2nd International Conference on Fog and Fog Collection*, 293–96.
7. Bruijnzeel LA, Eugster W, Burkard R, 2005, Fog as a Hydrologic Input, *Encyclopaedia of Hydrological Sciences, Chichester, UK: John Wiley & Sons*, 559–82.
8. Ritwick Ghosh, Tapan K.Ray, Ranjan Ganguly, 2015, Cooling tower fog harvesting in power plants – A pilot study, *Energy*, 1018-1028.
9. Mithun Rajaram, Xin Heng, Manasvikumar Oza, Cheng Luo, 2016, Enhancement of fog-collection efficiency of a Raschel mesh using surface coatings and local geometric changes, *Colloids and surfaces A: Physicochemical and Engineering Aspects*, **508**, 218-229.
10. Beatrice White, Anjishnu Sarkar & Anne-Marie Kietzig, 2013, Fog-harvesting inspired by the *Stenocara* beetle - An analysis of drop collection and removal from biomimetic samples with wetting contrast, *Applies Surface Science*, 284, 826-836.