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Role of Long Neck weld Flange plate technology in precision Agriculture

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ABSTRACT
The development of the key success in water lifting devices with emphasis on the long neck weld flange plate (LNWFP) technology used in precision agriculture. There are many techniques used to uplift water from natural resources during the water scarcity periods. Uplifting of irrigation water through different resources played a pivotal role in water engineering. The study was conducted at Adaptive Research Farm, Kot Nainan during Kharif-2024 to evaluate the effectiveness of long neck weld flange plate (LNWFP) technology connected with water uplift generator and harvest rain water into the upland and low land fields through already installed underground PVC pipes where the irrigation water is needed. The farmers are using tractor drawn uplift pump for the drainage of excessive rain water from the paddy fields. For this purpose the overall consumption of diesel recorded @ 5-8 literhour-1, however the loss was observed in Pakistani 1375 to 2200 rupees at the farmer's field. To overcome this problem long neck weld flange plate (LNWFP) technology was developed to harvest rain water for irrigation into the required field through drainage points. By the use of this long neck weld flange plate with 3500W uplift generator consumed only one liter petrolhour-1 and its cost was observed in Pakistani rupees 270 only. By the use of this technology the rain water harvested from one field to the other field through already installed underground PVC pipes. This technology is cost effective, eco-friendly, easily installed with generator used in precision agriculture in future.

Introduction
Water is an extremely essential part for living things. The availability of water has played a vital role in the development of mankind, plants and animals in the ecosystems services (Yannopoulos et al., 2015). Water accessibility from high elevation required the expenditure of energy. However, the manually operated mechanical devices, or devices driven by natural forces, such as wind, had to be invented. Such water lifting devices originate in the prehistoric times (Mays, 2010). Water lifting techniques have present since ca. 3000 BC in different parts of the world (Ann, 2009). The ecosystems required between 60-90% of available water, depending on the climate and economic development of the region (Adeyemi et al., 2017; Velasco-Muñoz et al., 2018). About 275 million hectares of land are used for irrigated crops worldwide, and their area is growing to increase 1.3% annually (Hedley et al., 2014). Despite making up only 23% of the total area under cultivation, these crops provide 45% of the world's food production (Gago et al., 2015; Zhang et al., 2017). Severe water shortages are occurring in an increasing number of places worldwide. Many factors, including the effects of global climate change, rapid population growth, land use changes, agricultural and urban expansion, the increase in demand for water from various productive sectors, the insufficient distribution of water resources, regional hydro-political conditions, the deterioration of water quality due to overexploitation, rainwater scarcity, and the high rate of evaporation and aridity brought on by rising temperatures, are contributing to the severe degradation of water resources (Fiaz et al., 2018; Liu et al., 2017). To overcome the problem of over irrigation through rain, the long neck weld flange plate (LNWFP) technology was developed to harvest rain water for irrigation into the required field through drainage points by pre installed underground PVC pipes at Adaptive Research Farm, Kot Nainan during Kharif-2024.

Materials and Methods
The study have been planned to evaluate the long neck weld flange plate (LNWFP) technology used in precision agriculture to uplift rain water harvest from paddy field having excessive rain water. The LNWFP consists of about one foot round thick plate with three inches round hole at its center. This pipe with hole is welded with 6 inches long pipe with three inches of diameter. This LNWFP is fitted with drain point (D-Point) where we want to uplift water and this pipe is fitted with generator. The other point of the generator is fixed with the uplift drain pipe according to the following picture.

Pictorial view showing the long neck weld flange plate (LNWFP) technology used in precision agriculture to uplift rain water harvest from paddy field having excessive water

Results and Discussion

Our investigations showed that the overall consumption of diesel recorded @ 5-8 liter per hour with the loss of Pakistani 1375 to 2200 rupees at the farmer's field. To overcome this problem long neck weld flange plate (LNWFP) technology was developed to harvest rain water for irrigation into the required field through drainage points. By the connection of this long neck weld flange plate with 3500W generator consumed only one liter petrolhour-1 and its cost was observed in Pakistani 270 rupees only. By this technology the rain water harvest from one field to the other field through PVC pipes is cost effective, eco-friendly, easily installed technology in precision agriculture. Many technologies and achievements in water uplifting devices are developed in ancient times (Yannopoulos et al., 2015). The researchers reported that the rainwater harvesting for agricultural irrigation has become a line of research with increasing relevance within irrigation engineering. This line of research become a driving force by rainwater harvesting for irrigation having strong potential as a source of supplementary water for the sustainability of agriculture. The researchers would be studied irrigation, given that rainwater harvesting for agricultural irrigation is becoming an increasingly relevant topic in the precision agriculture (Velasco-Muñoz et al., 2019).

References

Adeyemi, O., Grove, I., Peets, S., and Norton, T. (2017). Advanced monitoring and management systems for improving sustainability in precision irrigation. *Sustainability* 9, 353.

Ann, C. (2009). History of Water Pumps, eHow Contributor. Ehow.

Fiaz, S., Noor, M. A., and Aldosri, F. O. (2018). Achieving food security in the Kingdom of Saudi Arabia through innovation: Potential role of agricultural extension. *Journal of the Saudi Society of Agricultural Sciences* 17, 365-375.

Gago, J., Douthe, C., Coopman, R. E., Gallego, P. P., Ribas-Carbo, M., Flexas, J., Escalona, J., and Medrano, H. (2015). UAVs challenge to assess water stress for sustainable agriculture. *Agricultural water management* 153, 9-19.

Hedley, C. B., Knox, J. W., Raine, S. R., and Smith, R. (2014). Water: Advanced irrigation technologies.

Liu, J., Wang, Y., Yu, Z., Cao, X., Tian, L., Sun, S., and Wu, P. (2017). A comprehensive analysis of blue water scarcity from the production, consumption, and water transfer perspectives. *Ecological Indicators* 72, 870-880.

Mays, L. (2010). "Ancient water technologies," Springer.

Velasco-Muñoz, J. F., Aznar-Sánchez, J. A., Batlles-delaFuente, A., and Fidelibus, M. D. (2019). Rainwater harvesting for agricultural irrigation: An analysis of global research. *Water* 11, 1320.

Velasco-Muñoz, J. F., Aznar-Sánchez, J. A., Belmonte-Ureña, L. J., and Román-Sánchez, I. M. (2018). Sustainable water use in agriculture: A review of worldwide research. *Sustainability* 10, 1084.

Yannopoulos, S. I., Lyberatos, G., Theodossiou, N., Li, W., Valipour, M., Tamburrino, A., and Angelakis, A. N. (2015). Evolution of water lifting devices (pumps) over the centuries worldwide. *Water* 7, 5031-5060.

Zhang, Y., Zhang, Y., Shi, K., and Yao, X. (2017). Research development, current hotspots, and future directions of water research based on MODIS images: A critical review with a bibliometric analysis. *Environmental Science and Pollution Research* 24, 15226-15239.