

田間灌溉小給水路鋪設管路給水之可行性初探

Preliminary Study on the Feasibility of Laying Pipeline for Water Supply in Smaller Channel for Field Irrigation.

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摘 要

台灣地區小部分農田灌溉系統應用管路輸配水已行之有年，通常採用者是局部缺水且不適用地面灌溉之系統，或是高產值農產的地區如南投大坪頂及台東鹿野茶區等處；相較於地面灌溉系統，管路系統可能需要額外設置動力系統予以輔助，在管理上就會有系統水壓控制的課題，增加設置與管理成本。惟若土地與水資源的價值與成本顯著提高時，採用管路輸配水或可成為擴大既有灌區外農地的灌溉服務選項。

作者曾於任職水利會期間進行現地觀察，看到處於灌溉水源後端之部分灌區，其多見已毀損(程度不一)之小給水路，試若能規劃將其適當地配佈 $\Phi 300\text{mm}$ (或含以下管徑依現場實需)PVC 管建置成為配水管網，預期可獲得多項優勢，包括水源不易受到居民亂丟垃圾造成的可能污染、國家標準計量檢定(採用 TAF 實驗室認證流量計)與遠端監測控上具有如自來水管網物聯網管控等，另現場小給水路若能略事整理後即可成為豪大雨後的防洪暫存容積及為地下水補充。本文探究設置管路灌溉系統的合理考量事項，包括增設調蓄水池與水塔等設施規劃或可成為另種改善工程之作為。

關鍵詞：管路灌溉，管網監測，計量檢定，物聯網，地下水補充，防災防洪

Abstract

Some irrigation systems in Taiwan have been using pipelines for water transmission and distribution for many years. Usually, the systems used are local water shortages and are not suitable for surface irrigation, or areas with high output value agricultural products such as Nantou and Taitung with the surface irrigation system, the pipeline system may need to be supplemented by an additional power system, and there will be the issue of system water pressure control in management, which will increase the cost of setup and management. However, if the value and cost of land and water resources increase significantly, the use of

pipelines for water distribution may become an irrigation service option for expanding farmland outside existing irrigation areas.

The author had made observations and saw that in some irrigation areas at the rear end of the irrigation water source, small water supply channels that have been damaged are often seen. Including 300mm the following pipe diameters according to the actual needs of the site using PVC pipes are constructed as a water distribution network, and many advantages are expected to be obtained, including the water source being less susceptible to possible pollution caused by residents' littering, national standard measurement verification (using TAF laboratory certified flowmeter) In addition to remote monitoring and control, such as the Internet of Things management and control of the water pipe network, and the small water supply on site can become a temporary storage volume for flood control after heavy rain and supplement groundwater if it can be sorted out. This paper explores the reasonable considerations for setting up a pipeline irrigation system, including the planning of additional facilities such as adjustment reservoirs and water towers, which may become another improvement project.

Keywords: Pipeline irrigation, IoT, Disaster Prevention, Flood Control, Groundwater