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Study and design of an irrigation ramp

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**Presented by: MAZARI ABDESSAMEUD Dallal
AHMED BENALI Abdelraouf**

In front of a jury made up of:

President :	Mr. ETSOURI Salim	MCA, ENSA
Supervisor :	Mrs. GUEDIOURA Ilham	MCA, ENSA
Examiner :	Mrs. BOURAS-CHEKIRE F.Z	MCA, ENSA
	Mr. HITOUCHE Salim	MCA, ENSA
Guests :	Mr. BAHIRA Abdenacer	CEO of MARTEZ

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ABSTRACT:

Irrigation methods are essential for sustainable agriculture in the face of water scarcity. In Algeria, there are numerous irrigation systems, each with advantages and disadvantages that we explore in the document. Automated irrigation, especially in nurseries, is crucial for effective water management. Utilizing real-time data from sensors, these systems deliver precise water amounts, minimizing waste and optimizing plant growth.

Creating our irrigation ramp involved using Arduino, an open-source electronics platform, along with sensors to build an automated setup. The synergy between Arduino and sensors enables the development of a smart irrigation system that autonomously adjusts plant watering in response to specific environmental conditions. The testing and calibration of our automatic irrigation system aimed to and successfully validated its precision in watering pots based on soil moisture levels.

The entrepreneurial journey of transforming this technological innovation into a viable startup venture in Algeria's agricultural landscape was deeply examined via plenty economic studies.

Key Words:

Automatic Irrigation, Precise Irrigation, Nurseries, Innovation, Startup, Agricultural Technology, Resource Efficiency, Algerian Agriculture.

ملخص :

أساليب الري هي أساسية للزراعة المستدامة في مواجهة ندرة المياه. في الجزائر، هناك العديد من أنظمة الري، كل واحدة منها تأتي مع مزايا وعيوب تم استكشافها في الوثيقة. الري التلقائي، خاصة في مشاتل النباتات، أمر ضروري لإدارة فعالة للمياه. باستخدام البيانات الفورية من المستشعرات، تقوم هذه الأنظمة بتوفير كميات دقيقة من الماء، مما يقلل من التبذير ويحسن من نمو النباتات.

كان إنشاء ممر الري لدينا ينطوي على استخدام أردوينو، وهي منصة إلكترونية مفتوحة المصدر، بالإضافة إلى المستشعرات لبناء إعداد تلقائي. التآزر بين أردوينو والمستشعرات يمكن من تطوير نظام ذكي للري يعدل تلقائياً ري النباتات استجابة للظروف البيئية المحددة. كانت اختبارات وضبط نظام الري التلقائي لدينا تهدف إلى التحقق من دقته بنجاح في سقي الأواني استناداً على مستويات رطوبة التربة.

تم فحص الرحلة الريادية لتحويل هذا الابتكار التكنولوجي إلى مؤسسة ناشئة في المشهد الزراعي الجزائري من خلال العديد من الدراسات الاقتصادية.

كلمات مفاتيح :

الري التلقائي، الري الدقيق، الابتكار، المشاتل، مؤسسة ناشئة، التكنولوجيا الزراعية، كفاءة الموارد، الزراعة الجزائرية.

Résumé :

Les méthodes d'irrigation sont essentielles pour l'agriculture durable face à la rareté de l'eau. Les systèmes d'irrigation en Algérie, sont nombreux et présentent des avantages et des inconvénients que nous avons explorés dans le document. L'irrigation automatisée, notamment dans les pépinières, est indispensable pour une bonne gestion d'eau. En utilisant des données en temps réel provenant de capteurs, ces systèmes fournissent des quantités d'eau précises, minimisant le gaspillage et optimisant la croissance des plantes.

La conception de notre rampe d'irrigation a impliqué l'utilisation d'Arduino, une plateforme électronique open source, ainsi que de capteurs pour construire une configuration automatisée. La synergie entre Arduino et les capteurs permet le développement d'un système intelligent d'irrigation qui ajuste automatiquement l'arrosage des plantes en fonction des conditions environnementales spécifiques. Les tests et l'étalonnage de notre système d'irrigation automatique visaient à valider avec succès sa précision dans l'arrosage des pots en fonction du taux d'humidité du sol.

Le parcours entrepreneurial de transformer cette innovation technologique en une entreprise viable dans le paysage agricole algérien a été examiné en profondeur via de nombreuses études économiques.

Mots clés : Irrigation Automatique, Irrigation Précise, pépinières, Innovation, Startup, Technologie Agricole, Efficacité des Ressources, Agriculture Algérienne.