



Davao del Sur State College

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Laboratory Manual for ABE 619 - Land and Water Conservation Engineering



COLLEGE OF ENGINEERING AND TECHNOLOGY (CET)
Department of Agricultural and Biosystems Engineering (DABE)
Matti, Digos City

**Bachelor of Science in Agricultural and Biosystems
Engineering**

**LABORATORY MANUAL
for
ABE 619 - LAND AND WATER CONSERVATION
ENGINEERING**

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Preface

This **Laboratory Manual for Land and Water Conservation Engineering** was specifically curated for students in the Bachelor of Science in Agricultural and Biosystems Engineering program. This guide bridges the gap between theoretical principles and the practical demands of soil and water management. Through targeted exercises, you will master watershed assessment, hydrological analysis, and the design of conservation infrastructure. While this manual provides the technical framework, your success will depend on your analytical rigor, collaborative spirit, and commitment to engineering excellence.

The laboratory exercises outlined in this manual are strategically aligned with the global mandate for a sustainable and equitable future. By engaging in these technical simulations, you are directly contributing to the realization of the following **United Nations Sustainable Development Goals (SDGs)**:

- ❖ **SDG 2: Zero Hunger.** Agricultural productivity is closely tied to soil health and water availability. By mastering soil erosion control (RUSLE) and terrace design, students learn to prevent land degradation, which is essential for maintaining crop yields and long-term food security, thus contributing to ensuring sustainable food production systems and implement resilient agricultural practices.
- ❖ **SDG 6: Clean Water and Sanitation.** The manual's focus on watershed assessment and small water impounding projects (SWIP/SFR) teaches students how to manage water resources effectively, specifically contributing to the substantial increase in water-use efficiency.
- ❖ **SDG 13: Climate Action.** Land and water engineering is a frontline defense against climate change impacts, such as increased erosion and erratic rainfall. Designing spillways and embankments that can handle extreme weather events (as outlined in your methodology) prepares students to build climate-resilient infrastructure in agricultural areas, thereby contributing to strengthening resilience and adaptive capacity to climate-related hazards.
- ❖ **SDG 15: Life on Land.** Manual on morphometric analysis and soil conservation structures focuses specifically on halting and reversing land degradation and soil loss, thereby contributing to the combat of desertification and restoring degraded land and soil.

As you begin your work in the LWCE lab, remember: **safety is your primary objective.** Everytime you are conducting exercises, specially in the field, always wear your PPE and never handle specialized machinery without direct guidance. I am excited for you to dive into these exercises and discover the engineering principles—from watershed modeling to structural design—that drive modern, sustainable agriculture.

- Engr. Tuling



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