



**WATER WATCH  
PROGRAMME FOR**

**YOUNG LEADERS**

**(WWP4YL) MODULES SERIES II  
UNESCO-IHP MALAYSIA**





**WATER WATCH  
PROGRAMME FOR**

**YOUNG LEADERS**

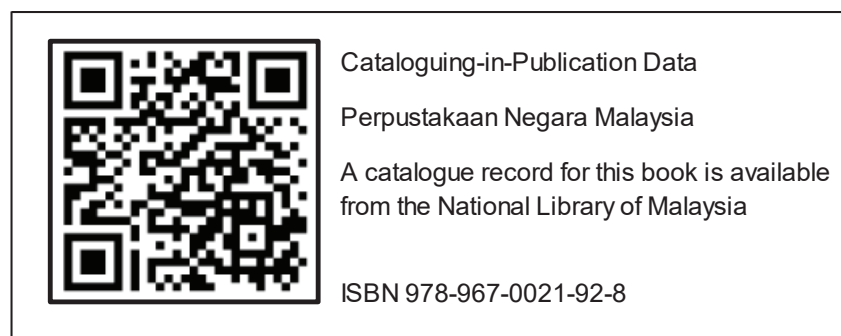
**(WWP4YL) MODULES SERIES II  
UNESCO-IHP MALAYSIA**

Editors

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**WATER WATCH PROGRAMME**

**FOR YOUNG LEADER (WWWP4YL)- MODUL SERIES II**

## ACRONYM

BEHI	The Bank Erosion Hazard Index
DID	Department of Irrigation and Drainage
ETPIC	Education, Training, and Public Information Committee
HRC	Hydrology Research Committee
IHP	Intergovernmental Hydrological Programme
JKPLPA	Jawatankuasa Pendidikan, Latihan dan Penerangan Awam
SoHPC	Standardization of Hydrology Practices Committee
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WWP4YL	Water Watch Program for Young Leaders



**WATER WATCH PROGRAMME**  
FOR YOUNG LEADER (WWWP4YL)- MODUL SERIES II

## FOREWORD

Alhamdulillah, thanks to Allah the Almighty for making the successful publication of the book Water Watch Program for Young Leaders (WWP4YL) Series II. After the publication of WWP4YL Series I in 2022, the publication of Series II is another milestone achievement from Education, Training and Public Information Committee, Jawatankuasa Pendidikan, Latihan dan Penerangan Awam (JKPLPA) of UNESCO IHP Malaysia. I know it is very challenging to publish two books in two consecutive years, but this Committee has successfully completed it. Therefore, I would like to thank all parties involved directly or indirectly who have contributed energy, time and expertise in the preparation and completion of this book.

Malaysia Intergovernmental Hydrological Programme (IHP Malaysia) is the National Committee that champions water resource awareness in Malaysia since 1975 when Malaysia became a member of UNESCO - IHP. Generally, IHP Malaysia has outlined three (3) main objectives related to hydrology and water resources awareness programme, namely (i) To promote and coordinate research programs in the field of hydrology and water resources (ii) To promote and coordinate the implementation of Best Management Practices (iii) To promote, coordinate and organize relevant programs in education, training and public information.

This objective is also in line with the aims of UNESCO's scientific program to strengthen water research, water resource management, education and activities related to capacity building. Based on the theme of the Ninth Phase cycle - IHP - IX (2022-2029), the activities carried out this year in Malaysia focus on the "Science for a Water Secure World in a Changing Environment". Thus, the water resources awareness program focuses on scientific knowledge and non-scientific methods by conducting training for stakeholders consisting of scientists, researchers, authorities, policy makers, agencies, academics, teachers, students, NGOs, and the public.

WWP4YL Series II which contains 12 modules is in line with UNESCO IHP Malaysia's objective in educating, training and sharing information related to hydrology and water resources. Couple with program under JKPLPA, I am confident we can develop sustainable development which adopt the best practices to protect water resources as well as environment. Continuous efforts have been implemented by JKPLPA for the past decades to enhance community awareness to protect the environment, especially water resources from being polluted and disturbed. Education is carried out among the young people at the primary and secondary school levels and as well as in higher education. Hopefully, future generations will be more knowledgeable to secure water resources, live in a clean and healthy environment.

Finally, I am very confident that through the publication of this book, all parties can use it to enhance knowledge and understanding related to the importance of managing water resources and will be more responsible in playing the role to manage, conserve, preserve, our water resources to ensure a sustainable future. It is something that can be achieved. Let's do it together.

**Mejar (K) Dato' Ir. Dr. Hj. Ahmad Anuar bin Othman**  
**Director General**  
**Department of Irrigation and Drainage**  
**Chairman for UNESCO – IHP Malaysia**



## PREFACE

Welcome to the Water Watch Program for Young Leaders (WWP4YL) Module Series II.

This book has three (3) parts. The first part consists of an introductory chapter introducing the theme for this book and a brief introduction of each of the WWP4YL module topics, while the second part presents the twelve (12) modules developed by subject matter experts from universities and other institutions, government agencies and other organizations on WWP4YL topics. This module covers twelve (12) topics divided into two themes, namely, i) fundamental aspects- which are important in understanding from a scientific point of view, and ii) experiential learning- towards understanding the practice, awareness, and current issues related to water. Together, six (6) modules are presented under the first theme, while the remaining seven (7) modules are presented under the second theme. The last part of this book presents the conclusion made from the modules presented in it.

As per module series 1, this module series is also designed to be flexible. Thus, each module is presented in a brief but easy- to-read format with a detachable worksheet(s) to carry out the exercise(s) and experiment(s) related to the module's topic. This is to ensure that WWP4YL trainers and participants feel that each module is flexible enough to carry anywhere as they can choose and tear any of the relevant modules to be used either as a separate material (individually) or as a combined material in a package form according to their needs when delivering WWP4YL program activities.

In line with our intention to make the content 'easy to read and use', each module is designed in such a way that it is briefly introduced via the title, general background and specific objectives sections before the activity is presented in a worksheet form. This allows both trainers and participants to work on each activity within the time frame proposed in the module. In addition, readers will find that each module applies teaching methods and activities that only suit the module's topic. Thus, it is common to find that some modules may have teaching method(s) and activity(ies) that are suitable for a classroom environment, while others may propose on-site experiments as the content is suitable for outdoor activities only. In short, while the content, teaching methods and delivery of activities may differ, it is important to note that module developers have designed the module in the best way possible as the aim is to motivate youths and get them to be engaged during module delivery since WWP4YL is supposed to be interactive. It is important to note that each module will focus on the 'what', 'why' and the 'how' aspects of learning. The 'what' aspect for instance may refer to the definition(s) of key terms being explained in the module. This is to help participants along the way since they may find some terms that may sound foreign and technical which they do not understand. The 'what' and 'why' aspect mainly are covered in the module's objectives while the 'how' aspect will be explained in the instructions made available in the worksheets. Some modules even provide Internet links for their activities, so participants can take part interactively.

We hope to see many more modules delivered under WWP4YL programs to be published in the next WWP4YL module series 3. The publication is significant as the modules are helpful for other water educators and campaigners in the future. For this to happen, though, we hope that more experts will join us in the effort to build our nation and the public's capacity for water knowledge and ethical consumption action.

Our appreciation lies with everyone that has lent a hand to make this effort materialize.

Thank you.

**Nabsiah Abdul Wahid**

**Noor Janatun Naim Jemali**

**Nik Mohd Noor Faizul Md Saad**

**Sazali Osman**





## ACKNOWLEDGEMENT

JKPLPA UNESCO-IHP Malaysia would like to take this opportunity to acknowledge the contributions of the following individuals who have helped the team establish WWP4YL Series II as a unique and meaningful program that has become JKPLPA's trademark today. They, through the position they held before (e.g., in DID Malaysia, UNESCO-IHP, in universities/higher learning institutions, government agencies, and other organizations) or through the towering persona, charismatic personalities, and level of knowledge they possess have provided us with a lot of inspiration and motivation to move WWP4YL forward so that the dream to produce more change agents among the Malaysian younger generation is achieved. The advice, financial and moral support, ideas and 'doa' have transformed us from being only the JKPLPA ordinary team to one big happy family of JKPLPA we are today. We salute these people who have made WWP4YL a success and how we made this WWP4YL module series possible. The first one was published in 2022, and this module (2023) is the second of many more to be published. While we have saluted some of these amazing people in the last module publication, many more are here to be acknowledged. Moreover, we will keep on adding in the next module series.

They are from DID Malaysia Dato' Ir. Haji Nor Hisham (ex-DG DID), Dato' Ir. Dr. Haji Md Nasir (ex-DG DID), Mejar (K) Dato' Ir. Dr. Haji Anuar bin Othman (DG DID), Dato' Ir. Sabri bin Abdul Mulok (Deputy DG DID), Ir. Hajah Bibi Zarina (ex-Deputy DG DID), Ir. Haji Azmi Ibrahim, Ir. Hajah Norlida, Ir. Nur Hareza, Ir. Mahidi Mahamood, Mr. Mohamad Ghadafi, Ir. Mohd Anuar, Mr. Nasarudin Nazir and Siti Zakirah Baharom.

They are also involved, the late Prof. Haji. Ismail Abustan (USM), the late Hj Zulkifli (UTHO), Prof. Dr. Salmah (USM) and Dr. Wan Zakaria (Nuklear Malaysia), Prof. Dr Munirah (USM- retired), Prof. Dato' Abd Rahman Mohammad (VC USM), Dato' Dr. Razli Bin Che Razak (VC UMK), Prof Datuk Ts. Dr. Ahmad Fauzi Ismail (VC UTM), Professor Dato' Gs. Ts, Dr. Ehwan Hj. Toriman (VC UKM), Profesor Dato' Dr. Mazlan bin Abd Ghaffar (VC UMT), Dr. Rahmah Elfithri (UNESCO Paris), Profesor Dato' Ts. Dr Zaliman bin Sauli (VC UniMAP), Prof. Dr Asmadi bin Mohamed Naim (VC UniSHAMS), Prof. Datuk Dr. Kasim Hj. Mansor (VC UMS), and many more to mention.

Thank you from the bottom of our hearts!



**WATER WATCH PROGRAMME**  
FOR YOUNG LEADER (WWWP4YL)- MODUL SERIES II

**PART 1:  
INTRODUCTION**



**WATER WATCH PROGRAMME**  
FOR YOUNG LEADER (WWWP4YL)- MODUL SERIES II

# UNESCO-IHP MALAYSIA - EDUCATING YOUNG LEADERS THROUGH WATER WATCH PROGRAMME

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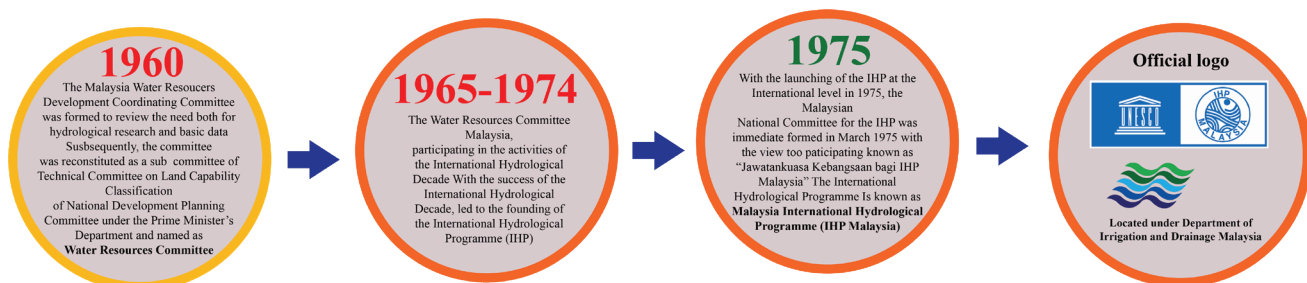
## INTRODUCTION

This chapter introduces the roles of UNESCO-IHP Malaysia in educating, training, and disseminating knowledge on related environmental issues, particularly sustainable water resource management practices, to Malaysian target groups, emphasising the Water Watch Programme for Young Leaders (WWP4YL). It begins by introducing readers to a brief history of UNESCO-IHP Malaysia, followed by identifying partners who help to co-organise and manage various water education programmes and activities involving WWP4YL. The chapter will also introduce readers to a summary of another twelve WWP4YL modules that we have developed for this second series to add to the nine modules that appeared in the first series.

## UNESCO-IHP MALAYSIA

### Brief History

UNESCO-International Hydrological Programme Malaysia was established in 1975 and is managed by the Department of Irrigation and Drainage Malaysia. It is National Committee and UNESCO's state member for The International Hydrological Programme (IHP), the United Nations Educational, Scientific and Cultural Organization's (UNESCO) international scientific cooperative program in water research, water resources management, education, and capacity-building. The history of UNESCO-IHP Malaysia can be summarised in Figure 1.1.



Source: <http://www.unescoihp.water.gov.my/>