

APF Net Curriculum 4

Course Syllabus

Sustainable Use of Forest Ecosystem Services

Semester Year

Course Title:	Sustainable Use of Forest Ecosystem Services
Credits:	3 credits

Instructor Name:	Dr. Wan Razali & Dr. Awang Noor
Phone Number:	+603 8946 7171
Email Address:	wanrazali@upm.edu.my & awangnoor@upm.edu.my
Office Location:	UPM Serdang, Selangor, Malaysia
Virtual Office Hours:	08.00 - 17:00 via email, WhatsApp and/or similar applications

Course Description

This course focuses on the sustainable production, utilization, and marketing of wood and other non-timber forest products (NTFP) in conjunction with the promotion of the sustainability of forest ecosystem services. The course also covers topics on creating forest-based livelihood opportunities for local communities and payments for ecosystem services (PES) and other economic instruments, including financial statements; analysis and basic concepts of economic valuation of forest ecosystem services; concept and theory of utility and welfare economics; types of economic value; approaches in economic valuation; steps involved and methods of economic valuation; forest resource accounting and applications of economic valuation including benefit cost analysis. Case studies in economic valuation of forest ecosystem services are included. The course dwells on status, classification and dynamics of world's forest resources including roles of forest resources in socio-economic expansion and sustainable development, international trade in wood and non-wood forest products. The course also covers timber, non-timber e.g. rattan, bamboo,

resin/oleoresin, herbal/medicinal plants, etc and non-wood forest products, e.g. water, bio-diversity, recreation, etc for socio-economic development. This course requires a prerequisite knowledge on the concept and principle of sustainable development versus its multiple use, economic and social implications, sustainable development and conservation of tropical forests. Its relationship with environmental management system and criteria and indicators in forest certification are discussed.

This course is designed for Master's level students studying forest management. It assumes a basic understanding in a range of disciplines, but in recognition that not everyone taking the course will have this knowledge, links are provided to sources of further information.

Course Prerequisites

Participants are expected to have completed FHU3207 (Forest Management I) and FHU3215 (Forest Economy) or their equivalents before enrolling into this course. Some knowledge of ecosystem services and resource valuations would be advantageous but not mandatory.

Course Format

This course is designed to be taken as an open, online course. The resources can be accessed by anyone/anytime. Participants will learn through a self-directed learning approach; there are no course activities and communications.

Course Objectives

The overall objective of this course is to improve the capacity of professional and semi-professional foresters to apply the concept of **Sustainable Use of Forest Ecosystem Services** within the overall concept of Sustainable Forest Management (SFM) in the Asia-pacific region by using an innovative pedagogical method through the combination of web-based learning in the areas of Payments for Ecosystem Services (PES), economic valuation of forest ecosystem services; concept and theory of utility and welfare economics; types of economic value, and forest resource accounting.

As indicated before, the course will introduce you to 6 learning modules - Module #1 is designed to be introductory – revisiting the concept of sustainable development, and #6 as application of forest ecosystem services valuation (including biodiversity) and a case study

approach. The main focus of forest ecosystem services are in Modules #2 to #5. The course is designed as 3-credit hour, that is to be undertaken on a weekly schedule of 3 hour session each and students should complete the 6 modules in 42 hours within 14 weeks duration per semester. Nevertheless, students are expected to put up 6 - 9 hours more per week to digest additional reading material and resources provided in the course.

By the end of this course, participants will be able to:

- (i) differentiate and evaluate the concept and principle in the management and development of sustainable (tropical) forest resources;
- (ii) elaborate the principle and present the strategy in the use of principle, criteria and indicators of the sustainable forest management and concept based on Inter-governmental, and NGO-based processes, ISO, and regional or country led initiatives;
- (iii) incorporate economic and financial principles in forest sector analysis;
- (iv) explain and use an appropriate theory, principle and concept of economic valuation of forest ecosystem services; and
- (v) discuss a case study on valuations of forest ecosystem services.

Course Materials

Required Textbook

Due to the nature of the course, there is no single textbook that accompanies this course. The following titles help in better understanding of this online course:

1. Hanley, N., & Barbier, E. B. (2009). *Pricing nature: cost-benefit analysis and environmental policy*. Cheltenham: Edward Elgar Publishing.
ISBN-13:978-1848444706
2. Kumar, P. (Ed.). 2010. *The economics and ecosystems of biodiversity: ecological and economic foundations*. New York: Routledge. ISBN-13: 978-1849712125
3. United Nation Environment Program. (2008). *Payments for ecosystem services getting started: a primer*. Nairobi: Forest Trends, The Katoomba Group, and UNEP.
ISBN: 978-92-807-2925-2. Retrieved from
http://www.unep.org/pdf/PaymentsForEcosystemServices_en.pdf

There is a wide range of other textbooks that are aimed at specific parts of this course. These are referred to in the individual topics.

Supplementary Readings

You will be expected to read a considerable amount of supplementary material. This is referred to in the individual topics, but the following general supplementary readings are recommended:

1. Bateman, I. J., Carson, R. T., Day, B., Hanemann, M., Hanley, N., Hett, T., Hett, T., Jones-Lee, M., Loomes, G., Mourato, S., Özdemiroglu, E., Pearce, D.W., Sugden, R., & Swanson, J. (2002). *Economic valuation with stated preference techniques: a manual*. Cheltenham: Edward Elgar Publishing, Inc. ISBN 1-84376-919-4
2. Blaser, J., Sarre, A., Poore, D., & Johnson, S. (2011). *Status of tropical forest management 2011* (ITTO Technical Series No. 38). Yokohama: International Tropical Timber Organization. ISBN 4-902045-78-8. Retrieved from http://www.itto.int/technical_report/.
3. Hanley, N., & Barbier, E. B. (2009). *Pricing nature: cost-benefit analysis and environmental policy*. Cheltenham: Edward Elgar Publishing, Inc. ISBN-13:978-1848444706
4. Pagiola, S., von Ritter, K., & Bishop, J. (2004). *Assessing the economic value of ecosystem conservation* (Environment Department Paper No. 101). Washington, DC: The World Bank. Retrieved from <http://cmsdata.iucn.org/downloads/pagiolaritterbishoploug.pdf>.
5. Wunder, S. (2005). *Payments for environmental services: some nuts and bolts* (CIFOR Occasional Paper No. 42). Jakarta: Center for International Forestry Research. ISSN 0854-9818. Retrieved from http://www.cifor.org/publications/pdf_files/OccPapers/OP-42.pdf.

Course Schedule

As this is an online course, you can complete the topics and modules at your own pace. The speed at which you progress through the course will depend on a number of factors, including how well you can understand English, how much you already know about forest management and economics and forest ecosystem services, and how familiar you with the materials.

Start Week	Module/Unit	Core Ideas	Learning Activities
❖ Module 1: Concept of Sustainable Development Revisit (by Wan Razali)			
1	Module 1 Topic 1 Economic Growth and Sustainable Development	TBD	<ul style="list-style-type: none"> ○ Review course introduction and overview materials. ○ Read background information ○ Read online lecture presentations ○ Investigate resources ○ Answer self-reflection questions
1	Module 1 Topic 2 SFM Criteria and Indicators of Inter-governmental Processes	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentation ○ Investigate resources ○ Answer self-reflection questions
2	Module 1 Topic 3 SFM Principle and Criteria of Non-Governmental Processes	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentations ○ Answer self-reflection questions
2	Module 1 Topic 4 SFM Criteria and Indicators of Region and/or Country led Initiatives	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentation ○ Answer self-reflection questions ○ Do a self-test for Module 1
❖ Module 2: Classification of Forest Ecosystem Services (FES) (by Awang Noor)			
3	Module 2 Topic 1 Provisioning Services & Regulating Services	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentations ○ Investigate resources ○ Answer self-reflection questions
4	Module 2 Topic 2 Supporting Services & Cultural Services	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentations ○ Investigate resources ○ Answer self-reflection questions

4	Module 2 Topic 3 Importance of Forest Ecosystem Services in National Economy	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentations ○ Investigate resources ○ Answer self-reflection questions ○ Do a self-test for Module 2
❖ Module 3: Multiple Use Concept and Sustainable Use of Forest Ecosystem Services (by Awang Noor & Wan Razali)			
5	Module 3 Topic 1 Multiple use Approach and Trade-offs	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentation ○ Investigate resources ○ Answer self-reflection questions
6	Module 3 Topic 2 Strategic Use and Conservation of Forest Resources	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentation ○ Investigate resources ○ Answer self-reflection questions ○ Do a self-test for Module 3
❖ Module 4: Concept and Theory of Economic Valuation of Forest Ecosystem Services (by Awang Noor)			
7	Module 4 Topic 1 Utility Theory and Welfare Economics	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentation ○ Investigate resources ○ Answer self-reflection questions
8	Module 4 Topic 2 Economic Valuation of FES	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentation ○ Investigate resources ○ Answer self-reflection questions ○ Do a self-test for Module 4
❖ Module 5: Approaches and Techniques of Forest Ecosystem Services Valuation (by Awang Noor)			
9	Module 5 Topic 1 Market-based Techniques	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentations ○ Investigate resources

			<ul style="list-style-type: none"> ○ Answer self-reflection questions
10	Module 5 Topic 2 Stated Preference Methods - CVM vs. DCM	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentations ○ Investigate resources ○ Answer self-reflection questions
11	Module 5 Topic 3 Revealed Preference Methods - TCM vs. Hedonic Price	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentations ○ Investigate resources ○ Answer self-reflection questions ○ Do a self-test for Module 5
❖ Module 6: Application of Forest Ecosystem Services Valuation and Case Study of Economic Valuation (by Awang Noor & Wan Razali)			
12 & 13	Module 6 Topic 1 Benefit Cost Analysis (BCA), Natural Resources Accounting in National Forest Policy	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read online lecture presentations ○ Investigate resources ○ Answer self-reflection questions
13 & 14	Module 6 Topic 2 A Case Study of Economic Valuation - Stumpage Valuation & Recreation and Protected Area Valuations	TBD	<ul style="list-style-type: none"> ○ Read background information ○ Read lecture presentations ○ Investigate resources ○ Answer self-reflection questions ○ Do a self-test for Module 6

Course Structure

The course is organized in eight modules. Each module comprises one to four topics. Each module typically consists of background information, online video lectures, resources, and a self-test.

❖ **Module 1: Concept of Sustainable Development Revisit (by Wan Razali)**

- **Topic 1:** Economic Growth and Sustainable Development
- **Topic 2:** SFM Criteria and Indicators of Inter-governmental Processes

- **Topic 3:** SFM Principle and Criteria of Non-Governmental Processes
- **Topic 4:** SFM Criteria and Indicators of Region and/or Country led Initiatives

- ❖ **Module 2 : Classification of Forest Ecosystem Services (FES) (by Awang Noor)**
 - **Topic 1:** Provisioning Services & Regulating Services
 - **Topic 2:** Supporting Services & Cultural Services
 - **Topic 3:** Importance of Forest Ecosystem Services in National Economy

- ❖ **Module 3: Multiple Use Concept and Sustainable Use of Forest Ecosystem Services (by Awang Noor & Wan Razali)**
 - **Topic 1:** Multiple use Approach and Trade-offs
 - **Topic 2:** Strategic Use and Conservation of Forest Resources

- ❖ **Module 4: Concept and Theory of Economic Valuation of Forest Ecosystem Services (by Awang Noor)**
 - **Topic 1:** Utility Theory and Welfare Economics
 - **Topic 2:** Economic Valuation of FES

- ❖ **Module 5: Approaches and Techniques of Forest Ecosystem Services Valuation (by Awang Noor)**
 - **Topic 1:** Market-based Techniques
 - **Topic 2:** Stated Preference Methods: CVM vs. DCM
 - **Topic 3:** Revealed Preference Methods: TCM vs. Hedonic Price

- ❖ **Module 6: Application of Forest Ecosystem Services Valuation and Case Study of Economic Valuation (by Awang Noor & Wan Razali)**
 - **Topic 1:** Benefit Cost Analysis (BCA), Natural Resources Accounting in National Forest Policy
 - **Topic 2:** A Case Study of Economic Valuation - Stumpage Valuation & Recreation and Protected Area Valuations

Students taking this course should work through the course methodically. You are strongly advised to study the topics in the order that they are presented, but bear in mind that it is always possible to return to particular topics to study them in greater detail.

Student Evaluation

As this course is taken independently, you will not gain any official credits. You can assess your learning and understanding of the material through the self-administered quizzes that

you will find associated with each module.

Technical Requirements

There are no special technical requirements for taking this course other than being able to access Internet.