

環境評估理論與模型
Theory and Models of Environmental Evaluation
627 M1500
一〇二學年度第二學期

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授課對象：碩士班、博士班

學分：3 學分(半年、選修)

課程目的：本課程主要目的是介紹以評估環境資源的價值與效益之基本理論與模型，及這些方法在一些有價值但沒有價格之財貨的適用性，並列舉實證應用這些理論與模型，於各種環境資源及其他方環境財貨評估的方法、結果與分析。同時亦歸納各種應用的困難及未來發展方向。課程內容分為四大部份，第一部份介紹評估環境資源價值與效益在公共決策中之目的。第二部份介紹效益價值評估的基本理論。第三部份為環境資源評估的主要模型，分為市場、替代市場與假設市場三大類，同時也將討論，如果不是利用前述任何方法進行特定對象的評估，如何借用過去已完成之評估結果，推估所關心的環境資源財貨價值之效益移轉方法。第四部份為各類評估模型與理論之應用，應用對象為各種沒有市場價格但是有價值之資源的評估，如自然景觀、國家公園、生物多樣性、環境美質、食品安全、業餘運動與休閒計畫、文化資產、疫苗接種、公共健康，毒品管制中心，甚至槍械暴力的降低，及現在最熱門的議題如氣候變遷的影響。此外，這些理論與方法之應用，亦廣及環境污染改善效益之評估，與天然資源損害之評估，並探討如何以所評估結果作為補償之依據。

課程要求：（一）各種評估方法應用研究分享（碩、博士班分開）

每人(組)自行選擇數篇期刊文章(一定要選期刊文章，不能其他的文獻來源)與本課程第四部分有相關的內容(本綱要所列的文章可以協助你做一個開始)，採用本課程所涵蓋的各種評估方法，在各種資源、財貨與服務之應用，由國內外期刊論文(國內外之研究成果都要

有，不可全為國內期刊文章，或是全為國外期刊文章），由每人（組）輪流擔任主講，向大家介紹相關文獻的重點，評述這些文章可能進一步發展的空間與方向，並帶引大家一起討論，討論的重點屆時將會在一併在本作業進行的綱要中有所說明。碩士班同學所看的國內外文獻至少要為 10 篇（如為每組，則一組最多兩人要看 20 篇），而博士班同學所看的國內外文獻至少要為 15 篇（如為每組，則一組最多兩人要看 30 篇）。

這一部份的工作分成兩階段進行：

第一階段：

課程進行至適當階段，每人（每組）先繳交擬報告的題目及綱要，屆時將發給每人這一部份工作應完成的詳細內容及繳交時間的說明。

報告及綱要繳交日期：2014 年 4 月 30 日。

第二階段：

繳交一份所主講之所有主題文獻的簡介與評論（critique）內容最多 10 頁（13 號字，1.5 行距）。簡介要以每人（每組）對所選文獻的瞭解，同時以每人（每組）的文字寫出來，不要重述文獻現成的摘要，而評論則更是要彙整每人（每組）對這些文獻的正負面評價。短文寫作格式請參閱吳珮瑛，2014。『老師在講你有在聽嗎？論文寫作之規範及格式』一書。

口頭報告日期：依上課人數多寡，由期末考週開始倒數回每人（組）報告完為止，最多不超過三週。

（二）學期考試

涵蓋一學期所講授的全部內容，將以 take home 的方式在特定時間內完成並繳交。確切方式屆時將發予詳細規定。

- 主要用書：**
1. 吳珮瑛，2009。『環境與自然與資源值多少？效益價值衡量之概念、理論、方法與應用』，台中：新新台灣文化教育基金會。
 2. 吳珮瑛，2014。『老師在講你有在聽嗎？論文寫作之規範及格式』。台北：翰廬。
 3. 陳明健編，2003。『自然資源與環境經濟學—理論基礎與本土案例分析』。台北：雙業書廊。
 4. 蕭代基、鄭蕙燕、吳珮瑛、錢玉蘭、溫麗琪，2002。『環境保護之成本效益分析：理論、方法與應用』，台北：俊傑書局。

5. Boadway, Robin W. and Neil Bruce, 1991, *Welfare Economics*, New York: Basil Blackwell. (茂昌圖書公司) (置於總圖指定閱讀書單)
6. Freeman, A. M., 2003. *The Measurement of Environmental and Resource Value: Theory and Methods*. Second Edition. Washington, D. C.: Resources for the Future. (置於總圖指定閱讀書單)
7. Just, R. E., D. L. Hueth, and A. Schmitz, 2004. *The Welfare Economics of Public Policy: A Practical Approach to Project and Policy Evaluation*. Cheltenham, UK: Edward Elgar. (置於總圖指定閱讀書單)

閱讀文獻：詳見文獻目錄（學校沒有訂購之期刊上的文章，或者是前述之外的其他書本上的章節，將保留一份於總圖的指定閱讀書單中），同學可至總圖借閱，其他所有在學校有訂購的期刊文章，則請同學自行由學校網站上下載閱讀。

評分標準：	1.學期 take home 考試	50%
	2.各種評估方法應用研究分享	50%
	口頭報告	60%
	書面報告	40%

課程綱要：

I. 環境資源之評估與公共政策

- 柏拉圖準則 (Pareto criterion)
- 補償原則 (compensation principle)
- 潛在柏拉圖改善 (potential Pareto improvement)
- 柏拉圖安全 (Pareto safety)
- 社會福利函數 (social welfare function)

II. 經濟價值與效益衡量之基本理論

1. 環境資源經濟價值之哲學觀與內涵
 - 人類中心主義之環境倫理觀
 - 非人類中心主義之環境倫理觀
 - 修正人類中心之環境倫理觀
2. 環境資源總價值之成分與內涵
 - 使用價值
 - 非使用價值
 - 價值與距離的關係 (對估算總價值的啟示)
3. 個體經濟學對偶理論之回顧
4. 效用變動的貨幣衡量指標
 - 價格改變的福利衡量指標
 - 數量與品質改變之效益衡量指標
 - 願意支付額度與願意接受額度的關係
 - 各種福利衡量的真確值與近似值
 - 利用Hausman's 方式求算福利的真確值
 - 利用直接效用函數求算福利的真確值
 - 利用間接效用函數求算福利的真確值
 - 如何以Willig方式得知近似福利值之優劣
5. 多面向政策變動之效益衡量

III. 衡量與評估環境變動與自然資源效益的各種方法

1. 市場評估法
 - 市場評估法之基本概念
 - 市場價值之計算
2. 替代市場評估法
 - 旅行成本法 (travel cost method)
 - 特徵價格法 (hedonic price method)
3. 假設市場評估法 (hypothetical market valuation method)
 - 條件評估法 (contingent valuation method)
 - 聯合分析法 (conjoint analysis)

4. 效益移轉 (benefit transfer, value transfer)
- 平均效益移轉 (mean benefit transfer)
 - 效益函數移轉 (benefit function transfer)
 - 統合效益移轉 (meta benefit analysis)

IV. 各種評估方法之應用

1. 自然資源保育效益與價值

- 稀有及野生動植物保存之效益評估
- 保護海獅及大象等動物之效益評估
- 生態維護之效益評估
- 野生動物觀賞旅遊對保育生物多樣性價值的評估
- 濕地資源之經濟價值評估
- 天然資源損害之經濟價值評估
- 國家公園價值之評估
- 森林資源價值之評估
- 農業景觀維護之效益評估
- 熱帶雨林價值之評估
- 生物多樣性之價值評估
- 河川水流再生之價值評估
- 海岸生態之價值評估
- 海洋保護區價值評估
- 漏油對生態系統服務的損害
- 核能資源的社會價值

2. 環境維護的價值與效益

- 空氣污染改善之效益評估
- 機場噪音改善之效益評估
- 廢木料回收的價值評估
- 水質改善之效益評估
- 各種污染改善對農業效益之評估
- 美質與能見度改善之效益評估
- 都市林的景觀美值效益評估
- 居民對社區林業價值的評估
- 農業環境政策效益評估

3. 人體健康與生命價值的維護的效益

- 人類生命價值與健康之評估
- 降低死亡風險之願付價格的評估
- 改善健康之效益評估
- 對HIV與AIDS疫苗願付價值的評估
- 預防與治療之效益評估
- 公共衛生服務之效益評估
- 健康照護之價值與效益評估
- 人體暴露於有毒物質風險降低之效益評估
- 設置毒物管制中心的效益與價值評估
- 安全駕駛對風險降低的評估

— 暴露野火燃燒對健康的影響

4. 觀光遊憩與運動休閒

- 遊憩效益之福利評估
- 旅行需求之效益評估
- 滑雪纜車票價的評估
- 生態旅遊價值評估
- 運動賽會效益評估
- 倫敦奧運之效益評估
- 運動設施（體育館）效益評估
- 業餘運動與休閒的價值評估

5. 氣候變遷

- 對房價影響的評估
- 整體損害之評估

6. 文化資產價值之評估

- 歷史紀念碑的價值與效益評估
- 博物館的價值與效益評估
- 山區本地建築價值評估
- 原住民文化資產的價值與效益評估
- 訪客對世界文化遺址特徵之偏好

7. 氣象資訊價值的評估

8. 生活品質改善之效益評估

9. 食品安全價值的評估

10. 降低槍械暴力之效益評估

11. 評估結果如何提供相關損害之補償依據

閱讀文獻：(打*者與其他書本一起置於總圖書館指定閱讀書單中)

I. 環境資源之評估與公共政策

1-1 蕭代基、鄭蕙燕、吳珮瑛、錢玉蘭、溫麗琪，第2章。

1-2 Boadway and Bruce, Chapters 1, 2, 3, 5, 6.

1-3 Just, Hueth, and Schmitz, Chapters, 1, 2, 3.

II. 經濟價值與效益衡量之基本理論

2-1 吳珮瑛，第1、2、3、4、5章。

2-2 劉錦龍，1999。「評『多環境品質改善之效益分析：各種福利衡量指標之比較』」，『經濟論文』。27卷4期，543-559。

2-3 蕭代基、鄭蕙燕、吳珮瑛、錢玉蘭、溫麗琪，第2章。

2-4 Adamowicz, W. L., J. J. Fletcher, and T. Graham-Tomasi, 1989. "Functional Form and the Statistical Properties of Welfare Measures," *American Journal of Agricultural Economics*, 70:414-421.

2-5 Bateman, I. J., B. H. Day, S. Georgiou, and I. Lake, 2006. "The Aggregation of Environmental Benefit Values: Welfare Measures, Distance Decay and Total WTP," *Ecological Economics*, 60: 450-460.

2-6 Boadway and Bruce, Chapters 7, 8, 9.

2-7 Bockstael, N. E. and K. E. McConnell, 1980. "Calculating Equivalent and Compensating Variation for Natural Resource Facilities," *Land Economics*, 56:56-63.

2-8 Brookshire, D. S., A. Randall, and J. R. Stoll, 1980. "Valuing Increments and Decrements in Natural Resource Flows," *American Journal of Agricultural Economics*, 62:478-488.

2-9 Brown, T. C. and R. Gregory, 1999. "Why the WTA-WTP Disparity Matters," *Ecological Economics*, 28: 323-335.

2-10 Cameron, T. A., 1992. "Nonuser Resource Values," *American Journal of Agricultural Economics*, 74: 1133-1137.

2-11 Chipman, J. S. and J. C. Moore, 1980. "Compensating Variation, Consumer's Surplus, and Welfare," *American Economic Review*, 70:933-949.

2-12 Cicchetti, C. J. and L. L. Wilde, 1992. "Uniqueness, Irreversibility, and the Theory of Nonuse Values," *American Journal of Agricultural Economics*, 74: 1121-1125.

- 2-13 Currie, J. M., J. A. Murphy, and A. Schmitz, 1971. "The Concept of Economic Surplus and Its Use in Economic Analysis," *The Economic Journal*, 81:741-799.
- * 2-14 Dodgson, J. S., 1983. "Compensating and Equivalent Variation Measures of Investment Benefits with Multiple Price Changes," *Public Finance*, 38: 16-26.
- 2-15 Dubourg, W. R., M. W. Jones-Lee, and G. Loomes, 1994. "Imprecise Preferences and the WTP-WTA Disparity," *Journal of Risk and Uncertainty*, 9:115-133.
- 2-16 Freeman, Chapters 1, 2, 3, 4, 5, 8.
- 2-17 Hausman, J. A., 1981. "Exact Consumer's Surplus and Deadweight Loss," *American Economic Review*, 71:662-676.
- 2-18 Hicks, J., 1943. "The Four Consumer's Surpluses," *Review of Economics and Statistics*, 11:31-41.
- 2-19 Hoehn, J. P., 1991. "Valuing the Multidimensional Impacts of Environmental Policy: Theory and Methods," *American Journal of Agricultural Economics*, 73:289-299.
- 2-20 Horowitz, J. K. and K. E. McConnetll, 2002. "A Review of WTA/WTP Studies," *Journal of Environmental Economics and Management*, 44:426-447.
- 2-21 Just, Hueth, and Schmitz, Chapter 5, 6.
- 2-22 Kennedy, Chris J. and So-Min Cheong, 2013. "Lost Ecosystem Services as a Measure of Oil Spill Damages: A Conceptual Analysis of the Importance of Baselines," *Journal of Environmental Management*, 128: 43-51.
- 2-23 Kolstad, C. D. and R. M. Guzman, 1999. "Information and the Divergence between Willingness to Accept and Willingness to Pay," *Journal of Environmental Economics and Management*, 38: 66-80.
- 2-24 Krutilla, J. V., 1967. "Conservation Reconsidered," *American Economic Review*, 57:777-786.
- 2-25 Lazo, J. K., W. D. Schulze, G. H. McClelland, and J. K. Doyle, 1992. "Can Contingent Valuation Measure Nonuse Values?" *American Journal of Agricultural Economics*, 74:1126-1132.
- 2-26 McKenzie, G. W., 1979. "Consumer's Surplus Without Apology: Comment," *American Economic Review*, 69:465-468.
- 2-27 Nunes, P.A. L. D. and L. C. J. M. van den Bergh, 2001. "Economic Valuation of Biodiversity: Sense or Nonsense," *Ecological Economics*, 39: 203-222.

- 2-28 Plott, C. R. and K. Zeiler, 2005. "The Willingness to Pay-Willingness to Accept Gap, the "Endowment Effect," Subject Misconceptions, and Experimental Procedures for Eliciting Valuations," *American Economic Review*, 95:530-545.
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- 2-31 Randall, A. and J. Stoll, 1980. "Consumer's Surplus in Commodity Space," *American Economic Review*, 70:449-455.
- 2-32 Randall, A., 2004. 「Pricing the Outputs of Multifunctional Agriculture」, 『農業經濟叢刊』。9 卷 1 期, 1-25。
- 2-33 Saz-Salazar, S. D., F. Hernández-Sancho, and R. Sala-Garrido, 2009. "The Social Benefits of Restoring Water Quality in the Context of the Water Framework Directive: A Comparison of Willingness to Pay and Willingness to Accept," *Science of the Total Environment*, 407: 4574-4583.
- 2-34 Shechter, M., B. Reiser, and N. Zaitser, 1998. "Measuring Passive Use Value," *Environmental and Resource Economics*, 12: 457-478.
- 2-35 Sun, L., G. C. Van Kooten, and G. M. Voss, 2009. "What Accounts for the Divergence between Ranchers' WTA and WTP for Public Forage," *Forest Policy and Economics*, 11: 271-279.
- 2-36 Smith, V. K., 1983. "Option Value: A Conceptual Overview," *Southern Economic Journal*, 49:654-668.
- 2-37 Van Kooten, G. C., 1988. "Economic Impacts of Supply Management: Review and Comparison of Alternative Measures of Consumer Welfare Loss," *Canadian Journal of Agricultural Economics*, 36: 425-441.
- 2-38 Veisten, K., H. F. Hoen, S. Navrud, and J. Strand, 2004. "Scope Insensitivity in Contingent Valuation of Complex Environmental Amenities," *Journal of Environmental Management*, 73: 317-331.
- 2-39 Willig, R. D., 1976. "Consumer's Surplus Without Apology," *American Economic Review*, 66:589-597.

III. 衡量與評估效益的各種方法

- 3-1 吳珮瑛, 第 6、7、8、9、10、11、12、13、14、15、16 章。
- 3-2 陳明健編, 第 4 章。
- 3-3 蕭代基、鄭蕙燕、吳珮瑛、錢玉蘭、溫麗琪, 第 6、7、8 章。

- 3-4 Allen, B. P. and J. B. Loomis, 2007. "The Decision to Use Benefit Transfer or Conduct "Original Valuation Research for Benefit-cost and Policy Analysis," *Contemporary Economic Policy*, 26(1): 1-12.
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- 3-6 Armbrrecht, J., 2014. "Use Value of Cultural Experiences: A Comparison of Contingent Valuation and Travel Cost," *Tourism Management*, 42:141-148.
- 3-7 Arrow, K., R. Solow, E. Leamer, P. Portney, R. Randner, and H. Schuman, 1993. "Report of the NOAA Panel on Contingent Valuation," *Federal Register*, 58: 4600-4614.
- 3-8 Barton, D. N. and S. Mourato, 2003. "Transferring the Benefits of Avoided Health Effects from Water Pollution between Portugal and Costa Rica," *Environment and Development Economics*, 8: 351-371.
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- 3-13 Boyle, K.J. and J. C. Bergstrom, 1992. "Benefit Transfer Studies: Myths, Pragmatism, and Idealism," *Water Resource Research*, 28: 657-663.
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- 3-16 Brown, J. N. and H. S. Rosen, 1982. "On the Estimation of Structural Hedonic Price Models," *Econometrica*, 50:765- 768.
- 3-17 Cameron, T. A., 1988. "A New Paradigm for Valuing Non-market Goods Using Referendum Data: Maximum Likelihood Estimation by Censored Logistic Regression," *Journal of Environmental Economics and Management*, 15:355-379.

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IV. 各種評估方法之應用

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