



# WG3 Results report 2016-2021



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# Content



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# Main objective of WG3 activities

## WG3's primary objective was:

To consider the **cost-effectiveness** of woodland creation measures to improve water quality and providing other benefits.



Source: [https://en.wikipedia.org/wiki/Buffer\\_strip](https://en.wikipedia.org/wiki/Buffer_strip)

# Main activities, part 1

## Work group meetings and results

### *1. First Full Meeting of PESFOR-W - Nancy, France*

- 🌳 Introduction of work group members and creation of task groups.
- 🌳 Developing a “**Conceptual framework for evaluating PES cost-effectiveness**” as base for work group research, joint publication and PESFOR-W COST action user manual.

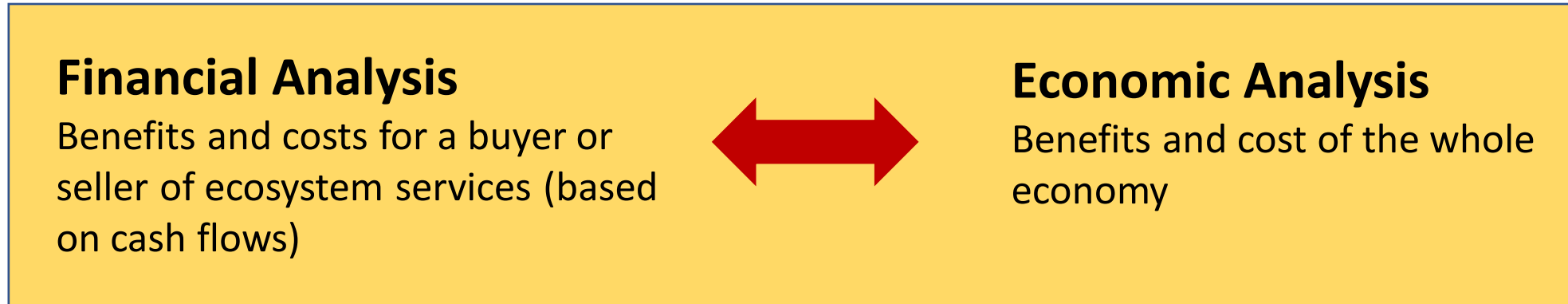
### *2. Second Full Meeting of PESFOR-W - Opatija, Croatia*

- 🌳 Conceptualization of two perspectives on the cost-effectiveness “payments to woodlands for improving water quality”: financial (buyer/seller ES) and economic (society) perspective.

# Main activities, part 2

## 3. Third Full Meeting of PESFOR-W - Padova, Italy

- ✿ Refining definition and methods to assess the financial and social (economic) cost-effectiveness of PES to forest for water (quality).



- ✿ Presentation and discussion of results STSM conducted by Cristian Accastello, PhD student (University of Torino, Italy) on CEA

# Main activities, part 3

## *4. Fourth Full Meeting of PESFOR-W - Stavanger, Norway*

- ✿ Establishment of **common understanding of concepts and metrics of cost-effectiveness** for different water purification alternatives or portfolio of green and grey technologies, can also be affected by the co-benefits associated with each option.
- ✿ Co-benefits refer to other beneficial outcomes (positive externalities) delivered by the water purification alternative. For forest-based solutions, these include benefits such as carbon sequestration, recreation, and biodiversity conservation as well as water quantity-related benefits from flood risk attenuation and potential disbenefits such as reduced water flows during droughts.

# Main activities, part 4

## *5. Fifth Full Meeting of PESFOR-W - Albena, Bulgaria*

- ✿ *Dissemination and discussions of results of the PESFOR meeting*
- ✿ Preparing results for a joint publication written in collaboration with work participant from WG2.

## *6. Sixth Full Meeting of PESFOR-W - Killarney, Co. Kerry, Ireland*

- ✿ Consideration of WG3 part of manual titled “A Step-by-Step Guide for Payment Schemes”.

## *7. Seventh Full meeting of PESFOR-W - Bratislava, Slovakia - October 2019*

- ✿ Prefinal adjustment of content of WG3 chapter from A Step-by-Step Guide for Payment Schemes”.

# Main activities, part 5: other meetings

## *8. Writing workshop: San Sebastian, Spain - October 2018*

Joint cost-effectiveness

## *9. Odense, Denmark - March 2019 - Joint*

### *Work Groups 2 and 3 workshop*

Study of Woodlands for water PES in Denmark

three case studies

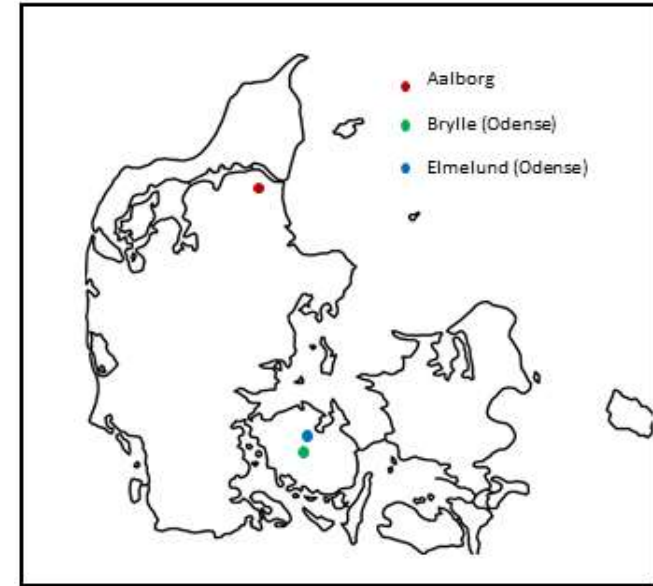
## *10. Brussels, Belgium - March 2019*

Main objectives and structure

User manual: “A Step-by-Step Guide for Payment Schemes”.

## *11. Training School: Analysis of the cost-effectiveness of woodland for water PES, Freiburg, Germany October 2020*

Organised by Rasoul Yousefpour (University of Freiburg)



**Location of case studies in Denmark**



# Short time scientific missions

- STSM beneficiary: **Cristian Accastello**, PhD student Home institution: University of Torino, Italy
- Title: **Approaches to quantify the cost-effectiveness of Forest for Water PES**
- STSM tutor: Serge Garcia, Senior researcher INRA, Deputy director of BETA (Bureau for Economic Theory and Applications) Host institution: INRA Nancy, France
- The aim of the STSM, focused on **investigating the most promising approaches to enhance the cost-effectiveness of the PES schemes.**
- Results - The results were relevant for the future activities of the Action: particularly to notice how few experiences of cost-effectiveness f quantification are available.

# Short time scientific missions

- STSM beneficiary: **Ms Khrystyna Vasylyshyn**, Institute of Ecological Economics and Management, Ukrainian National Forestry University, Lviv, Ukraine
- Title: **Woodlands for water PES schemes review in Denmark**
- STSM tutor: Prof. Mette Termansen, Department of Food and Resource Economics, University of Copenhagen, Denmark
- The aim of the STSM was **to identify woodlands for water payments for ecosystem services (PES) schemes in Denmark.**
- The results were relevant to better understand the wider benefits and cost of planting forest in previous agricultural lands as mean to reduce pesticides and nitrates diffuse pollution to ground water.)

# Some relevant results

## User manual:

- 🌳 Contribution to the “A Step-by-Step Guide for Payment Schemes”

## Joint publication:

- 🌳 Valatin, et al. (under revision). **Approaches to cost-effectiveness of payments for tree planting and forest management for water quality services.** Submitted (*Ecosystem Services*)

## National co-funded projects

- 🌳 Bulgarian Scientific Fund DCOST 01/30 / 20.12.17-20.12.19: "Development of a scheme for assessment of forest ecosystem services, efficiency of their provision through the creation of forest belts for the purpose of purification and protection of waters and other natural components in the regions" – M. Lyubenova and A. Chikalanov

# Summary

- 🌳 10 meetings have been taken place;
- 🌳 24 related papers by WG3 PESFOR-W members were published or submitted for publication (Annex1);
- 🌳 A training school on PESFOR-W cost-effectiveness analysis;
- 🌳 Two STSM mission with a PhD students were carried out;
- 🌳 A national project (Bulgaria) was implemented in which four doctoral students took part.

**As a result of these activities, the initial objective of WG3 was met.**

MANY THANKS TO ALL WG3 AND PESFOR-W MEMBERS!



UICN. Draw me a tree. <https://www.iucn.org/fr/node/5296>

# Annex 1 Full list of publications

1. **Valatin, G.** et al. 2017. PESFOR-W: Improving the design and environmental effectiveness of woodlands for water Payments for Ecosystem Services. *Research Ideas and Outcomes*, 3, 1-28. e13828 doi: 10.3897/rio.3.e13828
2. **Lyubenova, M.**, J. Petrov, R. Radev, L. Keca, A. Al-Tawaha, A. **Chikalanov**. 2019. FOREST SHELTER BELTS. ENVIRONMENTAL AND ECONOMIC BENEFITS. - In: *Forest ecosystem services and Payment schemes (Case study)*. M. Lyubenova (Ed.), St. Kliment Ohridski University Press, Sofia, 13-62. ISBN 978-954-07-4778-1
3. **Lyubenova, M.**, **A. Chikalanov**. 2019. DEVELOPMENT OF PAYMENT SCHEMES FOR PROVIDED SERVICES OF FOREST SHELTERBELTS. - In: *Forest ecosystem services and Payment schemes (Case study)*. M. Lyubenova (Ed.), St. Kliment Ohridski University Press, Sofia, 63-80. ISBN 978-954-07-4778-1.
4. **Chikalanov, A.**, **M. Lyubenova**. 2019. COST EFFECTIVENESS ASSESSMENT OF FOREST ECOSYSTEM SERVICES. - In: *Forest ecosystem services and Payment schemes (Case study)*. M. Lyubenova (Ed.), St. Kliment Ohridski University Press, Sofia, 81-95. ISBN 978-954-07-4778-1
5. Petrov, J., **A. Chikalanov, M. Lyubenova, R. De Vreese, G. Valatin**. 2019. WEB PLATFORM FOR STRUCTURAL DESCRIPTION OF PUBLISHED PAYMENT SCHEMES FOR ECOSYSTEM SERVICES (PRACTICAL GUIDE)- In: *Forest ecosystem services and Payment schemes (Case study)*. M. Lyubenova (Ed.), St. Kliment Ohridski University Press, Sofia, 96-116. ISBN 978-954-07-4778-1
6. Bálíková K., Červená T., De Meo I., **De Vreese R.**, Deniz T., **El Mokaddem A., Kayacan B.**, Larabi F., Lībiete, Z., **Lyubenova M.I.**, Pezdevšek Malovrh Š., Potocki K., Pelyukh, O., **Rugani B.**, Sarvasova Z., Šálka, J., Stevanov, M, Stojnic, S., Jarský, V., Vuletić D., Zahvoyska, L., **Paletto A.** 2019. How Do Stakeholders Working on the Forest–Water Nexus Perceive Payments for Ecosystem Services?. *Forests* **2019**, 11, 12, 1-19. doi:10.3390/f11010012 IF 2.116 Hindex 60 13899341 Q1 SJR 1.329
7. Bálíková K., Červená T., De Meo I., **De Vreese R.**, Deniz T., **El Mokaddem A., Kayacan B.**, Larabi F., Lībiete, Z., **Lyubenova M.I.**, Pezdevšek Malovrh Š., Potocki K., Pelyukh, O., **Rugani B.**, Sarvasova Z., Šálka, J., Stevanov, M, Stojnic, S., Jarský, V., Vuletić D., Zahvoyska, L., **Paletto A.** 2019. How Do Stakeholders Working on the Forest–Water Nexus Perceive Payments for Ecosystem Services?. *Forests* **2019**, 11, 12, 1-19. doi:10.3390/f11010012 IF 2.116 Hindex 60 13899341 Q1 SJR 1.329
8. Nisbet, T., Maria-Beatrice Andreucci, M.-B., De Vreese, R., Högbom, L., Sonja Kay, S., Kelly-Quinn, M., Lyubenova, M.I., Leonardi, A., Ovando Pol, P., Quinteiro, P., Pérez Silos, I., Valatin, G. 2020. *Forest for Water Services: D Step-by-Step Guide for Payment Schemes*. Forest Research - Alice Holt Lodge, Farnham, Surrey GU10 4LH T 0300 067 5600 F 01420 23653 [www.cost.eu](http://www.cost.eu) Payments for Ecosystem Services (Forest for water) [www.forestresearch.gov.uk/research/pesforw](http://www.forestresearch.gov.uk/research/pesforw)

# Annex 1 Full list of publications

- 9. **Ovando, P.**, Speich, M., 2020. Optimal harvesting decision paths when timber and water have an economic value in uneven Forests. *Forests*, 11(9), 903; <https://doi.org/10.3390/f11090903>
- 10. Engel, S., **Ovando, P.**, 2019. Guest editorial special issue on payments for forest watershed services. *Water Resources and Economics*, 28, 100153 <https://doi.org/10.1016/j.wre.2019.100153>
- 11. **Ovando P.**, Beguería S., Campos, P., 2019. Carbon sequestration or water yield? The effect of payments for ecosystem services on forest management decisions in Mediterranean forests. *Water Resources and Economics*, 28, 10019. <https://doi.org/10.1016/j.wre.2018.04.002>
- 12. Creed, I.F., Jones, J.J., Garderen, E.A. Van, Ellison, D., McNulty, S.G., Vira, B., Wei, X., Bishop, K., Blanco, J.A., Gush, M., Gyawali, D., Lara, A., Little, C., Martin-Ortega, J., Mukherji, A., Murdiyarso, D., **Ovando, P.**, Sullivan, C.A., Xu, J., 2019. Managing forests for both downstream and downwind water. *Frontier in n Forests and Global Change*. 2, 1–8. <https://doi.org/10.3389/ffgc.2019.00064>
- 13. **Ovando, P.**, Brouwer, R., 2019 A review of economic approaches modeling the complex interactions between forest management and watershed services. *Forest Policy and Economics* 100, 164-176. <https://doi.org/10.1016/j.forpol.2018.12.007>
- 14. B. Vira, D. Ellison, S. G. McNulty; E. Archer, K. Bishop, M. Claassen, I. F. Creed, M. Gush, D. Gyawali, J. Martin-Ortega, A. Mukherji, D. Murdiyarso, **P. Ovando**, C. A. Sullivan, M. van Noordwijk, X. Wei, J. Xu, 2018. Management Options for Dealing with Changing Forest-Water Relations. In: I. F. Creed, M. van Noordwijk (eds.), *Forest and Water on a Changing Planet: Vulnerability, Adaptation and Governance Opportunities. A Global Assessment Report*. IUFRO World Series Volume 38. Vienna, pp. 121-146.
- 15. Classen, M., B. Vira, J. Xu, D. Gyawali, J. Martin-Ortega, **P. Ovando**, I. F. Creed, D. Ellison, S. G. McNulty, E. Archer, C. A. Sullivan, 2018. Current and Future Perspectives on Forest-Water Goods and Services. In: I. F. Creed, M. van Noordwijk (eds.), *Forest and Water on a Changing Planet: Vulnerability, Adaptation and Governance Opportunities. A Global Assessment Report*. IUFRO World Series Volume 38. Vienna, pp. 102-120.
- 16. **Paletto A**, Bálíková K, De Meo I (2021). Opinions towards the water-related Payments for Ecosystem Services (PES) schemes: The stakeholders' point of view. *Water and Environment Journal*
- 17. Bálíková K, Dobšínská Z, **Paletto A**, **Sarvašová Z**, Korená Hillayová M, Štěrbová M, Výboštok J, Šálka J (2020). The Design of the Payments for Water-Related Ecosystem Services: What Should the Ideal Payment in Slovakia Look Like? *Water* 12: 1583

# Annex 1 Full of publications

- ✿ 18. **Chikalanov, A., Lyubenova, M.,** Nikolov, R. 2016. "Future of Internet, Ecosystem Services and Sustainable Regional Development". ATINER'S Conference Paper Series, No: ECL2016-2135, Publisher: Athens Institute for Education and Research. ISSN: 2241-2891 URL Conference Papers Series: [www.atiner.gr/papers.htm](http://www.atiner.gr/papers.htm)
- ✿ 19. **Lyubenova, M.** 2019. Ecosystem services and benefits. Costs, Efficiency, Payments. University Publishing House "St. Kliment Ohridski ", Sofia, 250 pp. ISBN 978-954-07-4729-3
- ✿ 20. **Chikalanov, A., M. Lyubenova, S. Peteva, Y. Petkov, I. Todorova.** 2019. Cost Effectiveness Assessment of Forest Ecosystem Services for Water Bodies Protection.- In: Reflections on the Mediterranean. K. JurĚeviĚ, L. Kaliterna LipovĚan, O. Ramljak (Eds.), Publishers: Institute of Social Sciences Ivo Pilar, VERN' Group Croatian, Academy of Sciences and Arts, Scientific Council of Anthropological Research (HAZU), Euro-Mediterranean Academic Network (EMAN), 637 p. Mediterranean Issues, b.2, 481-492. ISBN 978-953-7964-77-1 (Institute of Social Sciences Ivo Pilar) ISBN 978-953-8101-04-5 (VERN' Group); National and university Library in Zagreb under the number 001034095
- ✿ 21. **Lyubenova, M., A. Chikalanov, S. Peteva, Y. Petkov, I. Todorova.** 2019. Development of Schemes for Provided Services of Forest Shelterbelts in Dry Climate. – In: Agrofood Conference E-BOOK, 14-27. <file:///C:/Users/User/Downloads/New%20Publication%20IstambulAGROFOOD-E-BOOK%20ORAL%20PRESENTATIONS.pdf>
- ✿ 22. **Lyubenova, M., A. Chikalanov, Y. Petkov.** 2019. Structural Model of Forest Ecosystem Services Payment for Water Quality Improvement. – In: Proceedings Book "INTERNATIONAL SYMPOSIUM "THE ENVIRONMENT AND THE INDUSTRY", SIMI 2019. Pascu, L., C. Lehr, G. Vasile, A. Constantin (Eds.), Publisher: National Research and Development Institute for Industrial Ecology. ECOIND, 238-245. ISSN-L:1843-5831 DOI: <http://doi.org/10.21698/simi.2019>; <http://doi.org/10.21698/simi.2019.fp31>
- ✿ 23. **Chikalanov, A., M. Lyubenova, Y. Petkov, S. Peteva, I. Todorova.** 2019. Web Repository for Ecosystem Services Payment Schemes. (Short communications). Journal of Balkan Ecology, v. 22, 1, 89. E-ISSN: 1311-0527/<http://en.ecobalk.com>



# Annex 2 Presentations in Conferences

- ✿ 1. Accastello et al. (2018) Assessing the cost-effectiveness of payments to woodland owners for water services, ESP 2018 Conference, San Sebastian, September.
- ✿ Valatin et al. (2018). Woodlands for water Payments for Ecosystem Services: an overview of initial findings, activities and ambitions of the PESFOR-W COST Action, ESP 2018 Conference, San Sebastian, September.
- ✿ 2. Lyubenova, M., G. Valatin. 2018. International Meeting “Payment for Ecosystem Services – Forest for Water (CA15206 PESFOR). Bulgarian Journal of Soil Science, v.3, issue 2, 150-153. ISSN 2534-8787 [www.bass.bg](http://www.bass.bg)
- ✿ 3. Lyubenova, M. 2018. International Meeting “Payment for ecosystem services - Forest for Water” (CA15206 PESFOR), Albena, Bulgaria. Annual of Sofia University, Volume 102, Book 2 BOTANY, 141-150. ISSN 0204-9910 (Print) ISSN 2367-9190 (Online)
- ✿ 4. Jordan Enev. 2018. ECOLOGISTS FROM AN INTERNATIONAL CONFERENCE VISITED SHABLA. They are here because of the unique for Europe field protection belts in Dobrudha. Municipal Newspaper "Izgreve", Shabla, issue 37, October 2, 2018, p.3.
- ✿ 5. Lyubenova, M., Valatin G. 2019. International Meeting on Payment for Ecosystem Services and Forest for Water COST Action (CA15205 PESFOR) Albena, Bulgaria (Short communication). Journal of Balkan Ecology, vol. 22, №4, 465-466.
- ✿ Yousefpour et al. (2020) Payment for Ecosystem Service Water (PESFOR-W): Assessing the cost-effectiveness of forests and woodland for water quality service. *Governing and managing forests for multiple ecosystem services across the Globe*, Bonn, February.