



Biographical Data

Field of Environmental Engineering,
Faculty of Engineering, Maharakham University
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Prof. Anongrit Kangrang, Ph.D.

ศาสตราจารย์ ดร.อนงค์ฤทธิ์ แข็งแรง

Education and Qualifications:

- 2006 Ph.D. Civil Engineering (Water Resource Engineering), Thammasat University, Thailand.
- 2000 M.Eng. Civil Engineering (Water Resource and Environmental Engineering), Thammasat University, Thailand.
- 1996 B.Eng. Environmental Engineering, Khon Kaen University, Thailand.

Present Position:

- 2019 – present, Vice President for Infrastructural Development, Research and Innovation
- 2016 – 2019, Dean for Faculty of Engineering Maharakham University
- 2014 – 2016, Director for General Education Institution, Maharakham University
- 2011 – 2014, Associate Dean for Administration of Graduate School, Maharakham University
- 2010 – 2011, Assistant to Dean for Academic Affairs and Insurance, Faculty of Engineering, Maharakham University
- 2006 – 2010, Head of Engineering School, Faculty of Engineering, Maharakham University

Work Experience:

- 2000 – present, Lecturer at Faculty of Engineering, Maharakham University
- 1998 – 2000, Assistant Teaching in Environmental Engineering



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Laboratory at Faculty of Engineering, Thammasat University
1996 – 1998, Engineer at TA & E Consultant Co., Ltd.

Training Crouse/License:

- 2009 Training of Trainers Course -IWRM as a basis for River Basin Organizations (RBO) Management “Improve efficiency and effectiveness for Water Security” 27-31 July 2009, Bangkok, Thailand
- 2001 Operation and Maintenance of Agricultural Machinery at Academy of Agricultural Mechanization Science (CAAMS), Beijing, China (August 25, 2001 – September 22, 2001)
- 2001 CNC & CAD/CAM Technology (CAD for Mechanical Drawing) at Thai-German Institute, Chonburi, Thailand (March 19, 2001 – April 12, 2001 and April 26,2001 – April 28, 2001)
- 2001 Application program PC ARCVIEW for GIS and area analysis at Faculty of Science and Technology, Thammasat University, Thailand (May 23, 2001 – May 28, 2001)

Current Research and Fund:

- 2001 The Study on Drainage System of Maharakham University Kamriang Campus, Grant from Engineering Faculty, Maharakham University
- 2002 A Study of Solids Waste Management of Maharakham Province, Grant from Engineering Faculty, Maharakham University.
- 2006 Optimization of Optimal Rule Curves using Genetic Algorithm, Grant from Faculty of Engineering, Maharakham University.
- 2007 A Behavior of Groundwater at Maharakham University, Khamriang Campus, Grant from Maharakham University.
- 2008 Optimal crop pattern for irrigation planning considering farmer participation, Grant from Maharakham University.
- 2018 Development of Reservoir Rule Curves using Tabu Search Technique, Grant from National Research Council of Thailand.
- 2018 Community Water Resources Management of Chi Basin under



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Climate Change, Grant from National Research Council of Thailand.

2019 Development of Storage Water Resource by Community Participation and Local Wisdom on Water Management for Increasing Storage Capacity, Grant from National Research Council of Thailand.

2021 Optimal reservoir rule curves for operating the medium and large sizes of reservoirs, Grant from Thailand Science Research and Innovation (TSRI).

2021 Development of future water demand system for future drought under the uncertainty of climate and land use changes and the participation of stakeholder in Chi River Basin, Grant from Agricultural Research Development Agency (ARDA).

Academic service

- A Study of Solids Waste Management and Detailed Design of Makok-Nue Municipal, Pattalung Province, Grant from Makok-Nue District Administrative Organization, Pattalung Province, 2003

Expertise Field:

- Wastewater Treatment Process and Design
- Application of Optimization Techniques to Solve Water Resources Problems.
- Water Resources Management

Teaching Subjects:

- 0301220 Hydrology
- 0301320 Hydraulic Engineering
- 0301428 Water Resources Management
- 0301567 River Basin Water Resources Planning and Management
- 0301662 Advanced Optimization for Water Management
- 0305320 Hydraulics of Wastewater and Rainstorm Drainage system
- 0305200 Introduction to Environmental Engineering



Recent Publications: *Journal Papers (International)*

1. Chaleeraktragoon, C. and **Kangrang, A.**, 2007. Dynamic programming with the principle of progressive optimality for searching rule curves." Canadian Journal of Civil Engineering, 34(2): 170-176.
2. **Kangrang, A.** and Chaleeraktragoon, C., 2007. Genetic Algorithms Connected Simulation with Smoothing Function for Searching Rule Curves. American Journal of Applied Sciences, 4(2): 73-79.
3. **Kangrang, A.** and Chaleeraktragoon, C., 2007. A Fuzzy-GAs Model for Determining Varied Irrigation Efficiency. American Journal of Applied Sciences, 4(6): 339-345
4. **Kangrang, A.** and Chaleeraktragoon, C., 2007. An Estimation of Irrigation Efficiency of Limited Water Resource Area. Journal of Applied Sciences, 7(19): 2744-2749.
5. **Kangrang, A.**, Phumphan, A and Chaiyapoom, W, 2008. Stochastic Inflow Simulation for Searching Rule Curves. American Journal of Applied Sciences, 5(3): 221-226.
6. **Kangrang, A.**, Phumphan, A and Chaleeraktragoon, C, 2008. Optimization Model for Irrigation Planning in Heterogeneous Area. Journal of Applied Sciences, 8(4): 666-671.
7. **Kangrang, A.**, and Chaleeraktragoon, C, 2008. Suitable Conditions of Reservoir Simulation for Searching Rule Curves. Journal of Applied Sciences, 8(7): 1274-1279.
8. **Kangrang, A.**, Compliew, S and Chaiyapoom, W, 2009. Heuristic Algorithm with Simulation Model for Searching Optimal Reservoir Rule Curves. American Journal of Applied Sciences, 6(2): 263-267.
9. **Kangrang, A.**, Compliew, S., Phoomiphan, N., Jamrutnet, K. and Khamsree, J., 2008. An Observation of Groundwater in Rapid Urbanization Area. Journal of Applied Sciences, 8(21): 3995-3998.



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10. Sivanpheng, O., **Kangrang, A.** and Lamom, A., 2009. A Varied-Utilized Soil Type in Linear Programming Model for Irrigation Planning. American J. of Engineering and Applied Sciences 2 (1): 133-138.
11. Kongsat, S., **Kangrang, A.** and Srisa-Ard, K., 2009. An Applied Local Wisdom to Manage Water for Developing Riverside Community: A Case Study of the Lam Ta Kong River Basin. Journal of Social Sciences 5(2): 134-138.
12. Hormwichian, R, **Kangrang, A.** And Lamom, A., 2009. A Conditional Genetic Algorithm Model for Searching Optimal Reservoir Rule Curves, Journal of Applied Sciences, 9(19): 3375-3380.
13. **Kangrang, A.** and Compliew, S., 2010. An Application of Linear Programming Model for Planning Dry-seasonal Irrigation System, Trend in Applied Science, 5 (1): 64 -70.
14. **Kangrang, A.**, Lamom, A. and Philakoun, S., 2010. Reduced Soil Moisture in Producing Soil-Cement Brick for Construction Materials Using Constructed Sieve, Housing Building and Drying in Open Air Methods. International Journal of Soil Science, 5(1): 11-18.
15. Phansuwan, W., Photisan, S. and **Kangrang, A.**, 2010. Silk-Cloth Weaving Development of the Mon -Khmer Ethnic Group in Lower-Isan. Journal of Social Sciences 6 (1): 1-3.
16. Buates, D., S. Chantachon, K. Paengsoi and **A. Kangrang**, 2010. Monks' Health: Holistic Health Care Model by Community Participation. J. Soc. Sci., 6: 478-482.
17. Thongwan, T., **A. Kangrang** and S. Homwuttiwong, 2011. An estimation of rainfall using fuzzy set-genetic algorithms model. Am. J. Eng. Applied Sci., 4: 77-81.
18. **Kangrang, A.**, Compliew, S. and Hormwichian, R., 2011. Optimal Reservoir Rule Curves Using Simulated Annealing. Proceedings of the Institution of Civil Engineers - Water



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- Management, 164 (WM1): 27-34. (2010 Impact Factor: 0.734).
19. **Anongrit Kangrang**, Anujit Phumphan, Sahalaph Homwuttiwong and Sudarat Compliew, 2011. A Fuzzy-GAs for Calculating Grass Reference Evapotranspiration. Journal of Applied Sciences, 11: 2599-2605.
 20. Niwat Phumiphan, **Anongrit Kangrang** and Worawat Sa-Ngiamvibool, 2011. An Improvement of Optimal Allocation Water for Cultivating Supper Chilli. Australian Journal of Basic and Applied Sciences, 5(11): 744-751.
 21. Pratya Mahavinijchaimontri, **Anongrit Kangrang** and PisitBoonchai, 2011. Development on Water Management System Connected to Public Law on Water Resource of the Chi River Basin Communities. European Journal of Social Sciences, 26 (3): 421-428.
 22. **Anongrit Kangrang**, Agnes Lehner and Peter Mayrhofer, 2011. An Improvement of Small Reservoir Rule Curves using Genetic Algorithms and Water Balance Equation. Australian Journal of Basic and Applied Sciences, 5(12): 707-714.
 23. Chetthaphan Lokham **Anongrit Kangrang** and Sahalaph Homwuttiwong, 2012. Making choices in the water allocation for the Lam Pao Reservoir Kalasin by Analysis Hierarchy Process. Australian Journal of Basic and Applied Sciences, 6(8): 43-49.
 24. Rattana Hormwichian, **Anongrit Kangrang**, Alongkorn Lamom, Chavalit Chaleeraktrakoon and Sanguan Patamatamkul, 2012. Coupled-operations model and a conditional differential evolution algorithm for improving reservoir management. International Journal of Physical Sciences, 7(42): 5701-5710.
 25. **Anongrit Kangrang**, and Chetthaphan Lokham, 2013. Optimal reservoir rule curves considering Conditional Ant Colony Optimization with simulation model. Journal of Applied Sciences, 13(1): 154-160.



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26. Worawat Sa-Ngiamvibool, Niwat Angkawisittpan, AdisornNuan-On, Chonlatee Photong, **Anongrit Kangrang**, 2013. A Rain Gauge System using a Capacitance Sensor. International Journal of Engineering and Technology, 5(4): 3596-3600.
27. **A. Kangrang**, C. Chaleeraktragoon, S. Patamatamkul and R. Hormwichian, 2013. Expert Participation with Optimization Technique for Improving Optimal Rule Curves of Reservoir. Bulgarian Journal of Agricultural Science, 19(5): 1146-1153. (2012 JCR Impact Factor: 0.189).
28. **Anongrit Kangrang** and Rattana Hormwichian, 2013. Optimal Reservoir Rule Curves using Conditional Shuffled Frog Leaping Algorithm and Simulation. International Journal of Earth Sciences and Engineering, 6(6): 1392-1399.
29. Pisan Ubompiphat, **Anongrit Kangrang** and Rattana Hormwichian, 2014. The Potential Allocation for Dry Season Crop-Area Planning, the HuaiLuang Operation and Maintenance Project, Thailand. International Journal of Engineering and Technology, 6(1): 350-357.
30. O. Sivanpheng, **A. Kangrang** and C. Chaleeraktragoon, 2014. Appraisal of Agricultural System in Laos PDR. Bulgarian Journal of Agricultural Science, 20(4): 1146-1153. (2012 JCR Impact Factor: 0.189).
31. Ounla Sivanpheng and **Anongrit Kangrang**, 2015. Water Resource Management of a Pilot Irrigation Scheme in Lao PDR. Philippine Agricultural Scientist, 98(2): 209-223. (2014/2015 JCR Impact Factor: 0.256).
32. Wallop Jiwlong and **Anongrit Kangrang**, 2015. Wavelet Filter Approach and Z-R Relationship in Meteorological Forecasting. Advances in Meteorology, vol. 2015, Article ID 858717, 12 pages, doi:10.1155/2015/858717. (2014/2015 JCR Impact Factor: 0.946).
33. Waranyu Buakhao and **Anongrit Kangrang**, 2016. DEM



- Resolution Impact on the Estimation of the Physical Characteristics of Watersheds by Using SWAT. *Advances in Civil Engineering*, vol. 2016, Article ID 8180158, 9 pages, doi:10.1155/2016/8180158.
34. **A. Kangrang** and W. Jiulong, 2016. Fuzzy-GA Approach for Estimating Rainfall over Upper Chi-Mun Basins of Thailand. *Journal of Agricultural Science and Technology*, 18(6): 1571-1581. (2015/2016 JCR Impact Factor: 0.815).
 35. Supakosol, J. and **Kangrang, A.** 2016. Climate Change Impact on Water Quality in Song Khram Basin, Thailand. *International Review of Civil Engineering*, 7(6): 176-184.
 36. H. Prasanchum, **A. Kangrang**, R. Hormwichian and S. Compliew. 2016. Impact of Climate and Rapid Land Use Change on Runoff Quantities in Lower-Lampao River Basin. *Mahasarakham International Journal of Engineering Technology*, 2(2): 1-5.
 37. Supakosol, J. and **Kangrang, A.** 2017. Assessment of soil loss and nutrient depletion due to Climate Change Impact in the SongKhram Basin, Thailand. *International Journal of Ecology & Development*, 32(2): 53-66.
 38. **Kangrang, A.**, Prasanchum, H and Hormwichian, R. 2017. Future runoff under land use and climate changes in the Ubolratana Basin, Thailand. *International Journal of Ecology & Development*, 32(3): 53-66.
 39. **Kangrang, A.**, Pakoktom, W., Nualnukul, W. and Chaleeraktragoon, C., 2017. Adaptive Reservoir Rule Curves by Optimization and Simulation. *Proceedings of the Institution of Civil Engineers - Water Management*, 170(WM5): 219-230. (2015/2016 Impact Factor: 0.656).
 40. Prasanchum, H. & **Kangrang, A.**, 2018. Optimal reservoir rule curves under climatic and land use changes for Lampao Dam using Genetic Algorithm. *KSCE Journal of Civil Engineering*, 22(1): 351-364. (2015/2016 Impact Factor: 0.600).



41. Hormwichian, R., Trongsiri, J. and Kangrang, A. 2018. Multipurpose rule curves for multipurpose reservoir by conditional genetic algorithm. *International Review of Civil Engineering*, 9(3): 114-121.
42. **Anongrit Kangrang**, Haris Prasanchum, and Rattana Hormwichian, Development of Future Rule Curves for Multipurpose Reservoir Operation using Conditional Genetic and Tabu Search Algorithms. *Advances in Civil Engineering*, vol. 2018, Article ID 6474870, 10 pages, 2018. <https://doi.org/10.1155/2018/6474870>. (2016/2017 Impact Factor: 0.827).
43. **A. Kangrang**, H. Prasanchum and R. Hormwichian. 2019. Active future rule curves for multi-purpose reservoir operation on the impact of climate and land use changes. *Journal of Hydro-environment Research*. Vol 24. May 2019. Pages 1-13. <https://doi.org/10.1016/j.jher.2019.03.001>. (2017/2018 Impact Factor: 2.087).
44. **A. Kangrang**, H. Prasanchum, R. Hormwichian, R. Techarungruengsakul, R. Ngamsert and T. Darakantong. 2019. Optimal Operating Reservoir using Flower Pollination Algorithms for Single Reservoir. *International Journal of Ecology & Development*. 34(2): 74-88.
45. J. THAIJARERN, K. WONGPAKAM, **A. KANGRANG**, P. PRAMUAL. 2019. A new species of black fly (Diptera: Simuliidae) in the Simulium (Simulium) multistriatum species-group from Thailand. *Zootaxa*. Vol. 4586. No.3. 461-474. <http://dx.doi.org/10.11646/zootaxa.4586.3.4>. (2017/2018 Impact Factor: 0.931).
46. **A. Kangrang**, N. Srikamol, R. Hormwichian, H. Prasanchum and O. Sriwanpheng. 2019. Alternative Approach of Firefly Algorithm for Flood Control Rule Curves. *Asian Journal of Scientific Research*. 12(3): 431-439.



47. **A. Kangrang**, R. Techarungruengsakul R. Hormwichian and O. Sriwanpheng. 2019. Alternative Approach of Wind Driven Optimization for Flood Control Rule Curves. *Journal of Engineering and Applied Sciences*. 14(21): 8026-8033.
48. T. Thongwan, **A. Kangrang** and H. Prasanchum. 2019. Multi-objective future rule curves using conditional tabu search algorithm and conditional genetic algorithm for reservoir operation. *Heliyon*. 5(9) e02401: 14 pages.
<https://doi.org/10.1016/j.heliyon.2019.e02401>.
49. **A. Kangrang**, H. Prasanchum, R. Hormwichian, R. Techarungruengsakul, R. Ngamsert, N. Phookinghin and J. Wangthken. 2019. Improvement of Water Management Project by Correcting Irrigation Water Requirement in Farmer Participation and Optimization. *Bulgarian Journal of Agricultural Science*. 25(5): 852-863.
50. N. Sinthuchai and **A. Kangrang**. 2019. Improvement of Reservoir Rule Curve using Grey Wolf Optimizer. *Journal of Engineering and Applied Sciences*. 14(24): 9847-9856.
51. **A. Kangrang**, R. Hormwichian, P. Pramual and K. Wongpakam. 2019. An improvement of reservoir rule curves for increasing storage capacity. *ARP Journal of Engineering and Applied Sciences*. 14(18): 1340-1356.
52. T. Thongwan, **A. Kangrang**, R. Techarungruengsakul, and R. Ngamsert. 2020. Future inflow under land use and climate changes and participation process into the Medium-Sized Reservoirs in Thailand. *Advances in Civil Engineering*, vol. 2020, Article ID 5812530, 17 pages, 2020.
<https://doi.org/10.1155/2020/5812530>. (2019/2020 Impact Factor: 1.176).
53. Prasanchum, H., **Kangrang, A.** and Hormwichian, R. 2020. Change in inflow and hydrologic response due to proactive agriculture land use policy in northeast of thailand.



- International Review of Civil Engineering, 11(3): 141-151.
54. Sriworamas, K., **Kangrang, A.**, Thongwan, T., Prasanchum, H. 2021. Optimal reservoir of small reservoirs by optimization techniques on reservoir simulation model. *Advances in Civil Engineering*, vol. 2021, Article ID 6625743, 14 pages, 2021. <https://doi.org/10.1155/2021/6625743>. (2020/2021 Impact Factor: 1.924).
55. Nuannukul, W. Phumiphan, A. and **Kangrang, A.** 2021. Cross-Drainage culvert design under global climate and land use changes. *ARPJ Journal of Engineering and Applied Sciences*. 16(10): 1036-1044.
56. Phumiphan, A. and **Kangrang, A.** 2021. Development of decision-making support tools for future reservoir management under climate and land cover variability: a case study. *International Review of Civil Engineering*, 12(4): 271-283. 21.
57. Yamoat, N., Hanchoo Wong, R., Sriboonlue, S. and **Kangrang, A.** 2022. Temporal change of extreme precipitation intensity–duration–frequency relationships in Thailand. *Journal of Water and Climate Change* (2022) 13 (2): 839–853. (2020/2021 Impact Factor: 1.900)
58. Techarungruengsakul R, **Kangrang A.** Application of Harris Hawks Optimization with Reservoir Simulation Model Considering Hedging Rule for Network Reservoir System. *Sustainability*. 2022; 14(9):4913. <https://doi.org/10.3390/su14094913>. (2020/2021 Impact Factor: 3.251).
59. Ngamsert, R., **Kangrang, A.** 2022. Applying of Marine Predators Algorithm Linked with Reservoir Simulation Model considering Sedimentation for Reservoir Operation. *Advances in Civil Engineering*, Vol. 2022, Article ID 1631914, 15 pages, 2022. <https://doi.org/10.1155/2022/1631914>. (2021/2022 Impact Factor: 1.843).



60. Songsaengrit S, **Kangrang A.** Dynamic Rule Curves and Streamflow under Climate Change for Multipurpose Reservoir Operation Using Honey-Bee Mating Optimization. Sustainability. 2022; 14(14):8599. <https://doi.org/10.3390/su14148599>. (2021/2022 Impact Factor: 3.889).

Conference (International)

1. Niwat Phoomiphan. and **Anongrit Kangrang.** A Monitoring Groundwater: Case Study Mahasarakham University, Khamrieng Campus. Proceedings of GMS Agricultural Conference February 9-10, 2008, Nakhon Phanom University, Nakhon Phanom Thailand.
2. Ounla Sivanpheng and **Anongrit Kangrang.** A Varied-Utilized Soil Type in LP Model for Irrigation Planning. Proceedings of GMS Agricultural Conference February 9-10, 2008, Nakhon Phanom University, Nakhon Phanom Thailand.
3. Witsanukorn Chaiyapoom and **Anongrit Kangrang.** An Application of Hill-climbing Algorithm for Searching Reservoir Rule Curves. Proceedings of GMS Agricultural Conference February 9-10, 2008, Nakhon Phanom University, Nakhon Phanom Thailand.
4. Ounla Sivanpheng and **Anongrit Kangrang.** A Multi-Functioned Soil Type in LP Model for Irrigation Planning. Proceedings of Technology and Innovation for Sustainable Development Conference (TISD2008), 28-29 January 2008. Faculty of Engineering, Khon Kaen University, Thailand.
5. Anujit Phumphan and **Anongrit Kangrang.** A Fuzzy-GAs for Estimating Evaporation. Proceedings of Technology and Innovation for Sustainable Development Conference (TISD2008), 28-29 January 2008. Faculty of Engineering, Khon Kaen University, Thailand.
6. **Anongrit Kangrang** and Anujit Phumphan. A Fuzzy Model for



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- Estimating Evaporation. Proceedings of Science and Technology Symposium for the Makhong Sub-Region Series I: Engineering Applications, 23 March, 2007. Vientiane, Lao People's Democratic Republic.
7. Chavalit Chaleeraktragoon and **Anongrit Kangrang**. "An allocation LP-based model for finding the crop pattern of irrigation project." Proceedings of 3rd Asia Pacific Association of Hydrology and Water Resources Conference, 16-18 October, 2006 Thailand.
 8. Chavalit Chaleeraktragoon and **Anongrit Kangrang**. "A Dynamic Programming for Searching Rule Curves." Proceedings of World Water & Environmental Resources Congress 2005 (ASCE), 15-19 May, 2005, Anchorage, Alaska, USA.
 9. **Anongrit Kangrang** and Krittiya Lertpocasombut "A *Microfiltration Membrane in Wastewater Treatment*" Proceeding of International Conference on Civil and Environmental Engineering, Hiroshima University, Japan, 23-24 October, 2003.
 10. **Anongrit Kangrang** and Krittiya Lertpocasombut "A *Microfiltration Membrane in Wastewater Treatment for Recycling*" Proceeding of International Conference on Water and Environmental, Bhopal, India, 15-18 December, 2003.
 11. **Anongrit Kangrang** Sudarat Compliew and Ounla Sivanpheng. An Allocation LP Model for Planning Dry-Season Irrigation Project. Proceedings of International Conference on Science, Technology and Innovation for Sustainable Well-Being (STISWB), 23-24 July 2009, Maharakham University, Thailand..