Dr. Tapan Kumar Kar
Professor
(Higher Administrative Grade)
(Former Head of the Department of Mathematics, IIEST, Shibpur)

Department of Mathematics
Indian Institute of Engineering
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Gender: Male

Academic qualifications:

1990: BSc (Honours) (**First Class first**) (Calcutta University) Major: Mathematics, Minors: Physics and Chemistry.

1993: MSc. (Calcutta University)(**First class 2nd**) Applied Mathematics, Specialization: Mathematical Biology.

1993: Qualified "National Eligibility Test (**NET**)" conducted by Council of Scientific and Industrial Research (CSIR) and University Grants Commission (UGC)

1993: Qualified "Graduate Aptitude Test in Engineering (**GATE**)", Ministry of Human Resource Development (MHRD), Government of India.

1994: M.Phil (Calcutta University) Applied Mathematics, Specialization: Mathematical Ecology.

2004: Ph.D. (Jadavpur University), Thesis title: Some Mathematical Models on Bioeconomic Harvesting Problems of Multispecies Fisheries. Supervisor: Professor Kripasindhu Chaudhuri, Jadavpur University.

2005-07: Post Doctoral Fellow (JSPS) Yokohama National University, JAPAN

2013: Visiting Professor, Kyoto University, Japan

2014: JSPS Invitation fellow, Kyushu University, Japan.

2017: Visiting Professor, Kyoto University, Japan

Teaching experience: 27 years

1996-2001: Lecturer, Department of Mathematics, Bengal Engineering and Science University, Shibpur, Howrah, India.

2001-2005: Senior Lecturer, Department of Mathematics, Bengal Engineering and Science University, Shibpur, Howrah, India.

2005- 2008: Assistant Professor, Department of Mathematics, Bengal Engineering and Science University, Shibpur, Howrah, India.

2008- 2011: Associate Professor, Department of Mathematics, Bengal Engineering and Science University, Shibpur, Howrah, India.

2011: Professor, Department of Mathematics, Indian Institute of Engineering Science and Technology, Shibpur.

2021: Professor (Higher Administrative Grade), Department of Mathematics, IIEST, Shibpur.

Research areas:

Dynamical systems.

Stability and bifurcation theory.

Population dynamics.

Mathematical ecology: Theoretical studies on ecology, population management, food chain, conservation of aquatic ecosystems, sustainable use of ecosystem services.

Modeling and control of epidemiological problems.

Mathematical modeling of eco-epidemiological problems.

Pest control.

Impact of invasive species on the sustainable utilization of native species

Research experience: 29 years

Courses undertaken:

Undergraduate: All the Mathematics courses at undergraduate level.

Post graduate: Differential Equations, Special functions, C-language, Computer programming, Nonlinear Dynamics, Mathematical Ecology.

Ph.D. guidance (awarded/thesis submitted /registered /enrolled):

Serial No.	Name	Title of the thesis	Remarks
1.	Dr. Ujjwal Kr. Pahari	The role of mathematical models on bio-economic harvesting problems of fisheries	Awarded on 21.01.2009
2.	Dr. Swarnakamal Misra	Modelling and analysis of some bioeconomic harvesting problems of fisheries	Awarded on 12.01.2010
3.	Dr. Ashim Batabyal	Mathematical modelling on the dynamics of ecological systems with special emphasis on epidemiological problems	Awarded on 30.06.2010
4.	Dr. Saroj Kr. Chattopadhyay	Management of exploited biological resources: Some mathematical models	Awarded on 24.11.2010
5.	Dr. Kunal Chakraborty	Bioeconomic modelling and development of solution techniques for the management and conservation of fisheries	Awarded on 15.03.2011
6.	Dr. Prasanta Kr. Mondal	Mathematical modelling and analysis of some epidemiological problems	Awarded on 27.05.2014
7.	Dr. Soovoojeet Jana	Model based studies on the dynamics of some complex ecological systems with special emphasis on epidemiological problems	Awarded on 09.06.2014
8.	Dr. Bapan Ghosh	Some model based studies on the dynamics of exploited biological resources	Awarded on 28.07.2014

9.	Dr. Abhijit Ghorai	Mathematical modelling and analysis of some ecological systems	Awarded on 18.08.2014
10.	Dr. Uttam Das	Effective use of ecological modelling for the management and conservation of renewable resources	Awarded on 02.03.2015
11.	Dr. Milon Chakraborty	Some mathematical models for the sustainable utilization of exploited biological resources	Awarded on 15.12.2015
12.	Dr. Samadyuti Halder	Nonlinear dynamics of some ecological systems with special emphasis on eco-epidemiology	Awarded on 18.02.2016
13.	Dr. Srabani Guria	Dynamic properties of some exploited predator prey systems-model based studies	Awarded on 19.09.2016
14.	Dr. Palash Halder	Mathematical approaches to analyze and control of infectious diseases	Awarded on 12.04.2017
15.	Dr. Prosenjit Paul	Modelling some aspects of ecosystem management and biodiversity conservation	Awarded on 27.10.2017
16.	Dr. Chaity Ganguli	Mathematical modelling of biological resources: Jointly determined ecological thresholds and economic trade-offs	Awarded on 31.10.2018
17.	Dr. Swapan Kr. Nandi	Modelling, analysis and control of some infectious diseases: A mathematical perspective	Awarded on 26.08.2019
18.	Dr. Kunal Das	Modelling the dynamic properties of some complex ecological systems from management and conservation perspectives	Awarded on 18.11.2019
19.	Dr. Debprasad Pal	Mathematical models applied to predator-prey systems for biological conservation	Awarded on 29.12.2020
20.	Dr. Debabrata Das	Modelling some aspects of the population dynamics relevant to the management of marine fisheries	Awarded on 25.01.2021
21.	Dr. Dhiraj Kr. Das	Mathematical modelling of some aspects of tuberculosis transmission and its control strategies	Awarded on 20.02.2021
22.	Dr. Manotosh Mandal	Model based studies on some epidemiological problems: Special emphasis on control strategies	Awarded on 20.05.2021
23.	Dr. Anupam Khatua	Mathematical modelling of some infectious diseases and their control strategies	Awarded on 23.11.2021

24.	Dr. Kanisha Pujaru	Mathematical modelling and system analysis for the description of ecological processes and the sustainable management of resources	Awarded
25.	Sovan Bera	Mathematical modelling of HTLV-I infection with CTL immune response	Submitted
26.	Suvankar Majee		Registered
27.	Sayani Adak		Registered
28.	Riya Das		Registered
29.	Bidhan Bhunia		Registered
30.	Esita Das		Registered
31.	Snehasis Barman		Registered
32.	Lakpa Thendup Bhutia		Registered
33.	Samir Biswas		Registered
34.	Subir Dey		Enrolled
35.	Sathi Patra		Enrolled

Post Doc/ RA/ Scientists:

Serial No.	Name	Designation	Year
1.	Prosenjit Paul	CSIR Research Associate	2019-2021
2.	Barnali Pyne	SERB Woman Scientist	2023-

Awards/Honours/Associateship:

1. Included in the list of Top 2 % Scientists in the World in all disciplines from India, based on the Stanford University Study, Year: 2020 onwards.
2. Joined in the editorial Board of the Journal "Mathematics and Computers in Simulation" (MATCOM) since 2021 (Elsevier)(SCI).

3. Certificate of **highly cited research** in Biosystems is awarded in December, 2016 (Elsevier).
4. National Scholarship from Government of West Bengal, India.
5. Debaprasad Ghosal Memorial Gold Medal for first Class first in B.Sc. from Ramkrishna Mission College, Narendrapur, India.
6. Certificate of merit for first class first in B.Sc (Hons) from University of Calcutta.
7. Certificate of merit for first class 2nd in M.Sc. from University of Calcutta.
8. Certificate of qualifying in Graduate Aptitude Test in Engineering (GATE), Department of Education, Ministry of Human Resource Development, Government of India.
9. Junior Research Fellowship (NET) from University Grants Commission.
10. Two years Post Doctoral Fellowship from the Japan Society for the Promotion in Sciences (JSPS), Yokohama National University, Japan, 2005-2007.
11. Visiting Professor- Kyoto University, Japan, 2013.
12. JSPS invitation fellowship, Kyushu University, Japan, 2014.
13. Visiting Professor, Kyoto University, Japan, 2017.

Projects (completed and ongoing):

A number of socially relevant projects are carried out such as:

1. Fisheries management: Bioeconomic modelling and development of solution techniques (2005 - 2007) --- Yokohama National University, Japan.
2. Integrated modeling approach of fisheries management and policy, (2008-2011) Funded by Council of Scientific and Industrial Research (CSIR), India.
3. Incorporating ecosystem objectives into management of sustainable marine fisheries: ecological economic modelling with some case studies along the coastal side of West Bengal (2011 - 2014) --- Funded by UGC, India.
4. Sustainable use of ecosystem services: Jointly determined ecological thresholds and economic trade offs (2013) --- Kyoto University, Japan.
5. Developing coupled social and ecological dynamics for global environmental change (2014) --- Kyushu University, Japan.

6. Transmission Dynamics and Spread of Infectious Diseases: Modelling, Prediction and Control (2015-2017) --- Funded by CSIR, India.
7. Modelling socio-economic aspects of ecosystem management and biodiversity conservation (2017)- Kyoto University Japan.
8. Sustainable use of ecosystem services under global environmental change: Developing coupled social and ecological dynamics (2019- 2022), CSIR.
9. Development of mathematical modelling and computational techniques of some class age structured epidemic problems (04.01.2023 - 03.01.2026), SERB, Govt. of India.

Citation Index:

Serial No.		Total Index	High Index
1.	Scopus	3361	32
2.	Google Scholar	5197	38

Research publications:

International reviewed (mostly SCI/SCOPUS) journal articles:

1. **Kar, T. K**. and Chaudhuri, K. S., On non-selective harvesting of a multispecies fishery. Int. J. Math. Educ. Sci. Technol. 33(4)(2002)543-556.
2. **Kar, T. K**. and Chaudhuri, K. S., On non-selective harvesting of two competing fish species in the presencetoxicity, Ecological Modelling, 161(2003)125-137.
3. **Kar, T. K**. and Chaudhuri K. S., Regulation of a prey-predator fishery by taxation: a dynamic reaction model. Journal of Biological System, 11 (2)(2003)173-187.
4. **Kar, T. K**. and Chaudhuri K. S., Regulation of a prey-predator fishery by taxation. Int. J. Math. Educ. Sci. Technol., .34(3)(2003)403-416.
5. **Kar, T. K**., Selective harvesting in a prey-predator fishery with time delay. Math. Comp. Model. 38(2003) 449-458.
6. **Kar, T. K**., Optimal harvesting and stability for a prey-predator system with stage structure, Advances in Modelling and Analysis Series D, 8(3)(2003) 61-71.
7. **Kar, T. K**. and Chaudhuri, K. S., Harvesting in a two prey one predator fishery: a bioeconomic model. The ANZIAM J. 45(3)(2004) 443-456.

8. **Kar, T. K**., A bioeconomic model of a tritrophic food chain fishery, Int. J. Nonl. Model. Sci. Eng. 2(1)(2004) 1-12.
9. **Kar, T. K**., Influence of environmental noises on the Gompertz model of two species fishery. Ecological Modelling, 173(2/3)(2004) 283-293.
10. **Kar, T. K**., Stability analysis of a prey-predator model with delay and harvesting. J. Biological Systems. 12(1)(2004)1-1.
11. **Kar, T. K**., Conservation of a fishery through optimal taxation: a dynamic reaction model. Commu. Nonl. Sci. Num. Simul. 10(2)(2004) 121-131.
12. **Kar, T.K**. and Chaudhuri, K. S., On selective harvesting of two competing fish species in the presence of environmental fluctuation. Natural Resource Modeling, 17(4)(2004)1-23.
13. **Kar, T. K**. Pahari, U.K. and Chaudhuri, K. S., Management of a single species fishery with stage structure. Int. J. Math. Edu. Sci. Tech. 35(3)(2004) 403-414.
14. **Kar, T. K**., Management of a fishery based on continuous fishing effort. Nonlinear Analysis: Real World Application, 5/4(2004)629-644.
15. **Kar, T. K**. Pahari, U.K. and Chaudhuri, K. S., Management of a prey-predator fishery based on continuous fishing effort. J. Biol. Syst. 12(3)(2004)1-13.
16. **Kar T. K**., Optimal harvesting and stability in a three level food chain fishery. Advances in Modelling and Analysis Series D, 25(1)(2004)31-46.
17. **Kar, T. K**., Stability of a stage structured prey-predator model. Advances in Modelling and Analysis Series D, 9(3)(2004)15-26.
18. **Kar, T. K**. Stability analysis of a prey-predator model incorporating a prey refuge. Communications in Nonlinear Sciences and Numerical Simulation 10(6)(2005)681-691.
19. **Kar T. K.,** Pahari U. K. and Chaudhuri K. S., Conservation of a prey-predator fishery based on continuous fishing effort. Journal of Applied Mathematics and Computing, 19(1/2)(2005)311-326.
20. **Kar T. K**., Stability and optimal harvesting of a prey-predator model with stage-structure for predator, Applicationes Mathematicae, 32(2005)279-291.
21. **Kar, T. K**. and Pahari, U. K., Non-selective harvesting in prey-predator models with delay, Communications in Nonlinear Science and Numerical Simulation. 11(4)(2005)499-509.
22. **Kar, T. K**., Optimal harvesting and stability for a prey-predator system with stage-structure for predator, Advances in Modelling and Analysis, Series D, 10(1)(2005)53-62.
23. **Kar. T. K**., Modelling and analysis of a harvested prey-predator system incorporating a prey refuge. Journal of Computational and Applied Mathematics, 185(2006)19-33.
24. **Kar. T. K**. and Matsuda H., Modelling and Analysis of Marine Reserve Creation, Journal of Fisheries and Aquatic Sciences. 1(1)(2006)17-32.

25. **Kar, T. K**., A mathematical model on bioeconomic harvesting of a nonlinear prey-predator fishery, Int. J. Math. Educ. Sci. Technol., 37(3)(2006)309-319.
26. **Kar, T. K**. and Matsuda H., Controllability of a harvested prey-predator system with time delay, Journal of Biological Systems, 14(2)(2006)1-12.
27. **Kar, T. K**., Controllability and optimal harvesting of a prey-predator model incorporating a prey refuge, Int. J. Math. Educ. Sci. Technl., 37(5) (2006) 559-571.
28. **Kar, T. K.** and Misra S., Influence of prey reserve in a prey-predator fishery, Nonlinear Analysis 65 (2006)1725-1735.
29. **Kar, T. K**., Misra S. and Mukhopadhyay B., A bioeconomic model of a ratio-dependent predator-prey system and optimal harvesting, Journal of Applied Mathematics and Computing 22(2006)(1/2)387-401.
30. **Kar, T. K.** and Matsuda H., An overview of bioeconomic analysis and management in fisheries, Journal of Fisheries and Aquatic Sciences 1(3)(2006)218-234.
31. **Kar, T. K**. and Misra S., Optimal control of a fishery under critical depensation. Journal of Fisheries and Aquatic Sciences 1(3)(2006)253-261.
32. **Kar T. K**., Pahari U. K., Modelling and analysis of a prey-predator systems with stage-structure and harvesting, Nonlinear Analysis: Real World Applications 8(2007)601-609.
33. **Kar. T. K**. and Matsuda H., Global dynamics and controllability of a harvested prey-predator systems with Holling type III functional response. Nonlinear Analysis: Hybrid Systems:1(2007)59-67.
34. **Kar T. K**., Pahari U. K., A model for prey-predator fishery with marine reserve, Journal of Fisheries and Aquatic Sciences 2(3)(2007)195-205.
35. **Kar, T. K**., Dynamics of a ratio-dependent prey-predator system with selective harvesting of predator species, Journal of Applied Mathematics and Computing 23(2007)(1/2)385-395.
36. **Kar, T. K**., A model for fishery resource with reserve area and facing prey-predator interaction, Canadian Applied Mathematics Quarterly 14(4)(2006)387-401.
37. **Kar T. K**. and Matsuda H., Permanence and optimization of harvesting return: a stage structured prey-predator fishery, Research Journal of Environmental Sciences 1(2)(2007)35-46.
38. **Kar, T. K**., Misra S., Modelling and analysis of a prey-predator system with stage-structure and harvesting, Advances in Modelling and Analysis, Series D, 12(3)(2007)31-44.
39. **Kar, T. K**. and Matsuda H., Regulation of a multi-fleet fishery., Research Journal of Environmental Sciences 1(3)(2007)93-101.

40. **Kar T. K**. and Matsuda H, Sustainable management of a fishery with a strong Alee effect, Trends in Applied Science Research 2(4)(2007)271-283.
41. **Kar, T. K.** Matsuda H, A bioeconomic model of a single species fishery with marine reserve, Journal of Environmental Management 86(1)(2008)171-180.
42. **Kar, T. K**. and Batbyal A., Stability and bifurcation of a prey-predator model with time delay, C. R. Biologies 332(2009)642-651.
43. **Kar, T. K**. and Chakraborty, K., Marine reserves and its consequences as a fisheries management tool. World Journal of Modelling and Simulation, 5(2)(2009)83-95.
44. **Kar, T. K**. and Chattopadhyay, S. K. A bioeconomic model of two-prey one predator system, Journal of Applied Mathematics and Informatics 27(5/6)(2009) 1411-1427.
45. **Kar. T. K**. and Chattopadhyay, S. K. Bioeconomic modeling: an application to the North-East Atlantic cod fishery, Journal of Mathematics Research 1(2) (2009) 164-178.
46. **Kar, T. K**. and Batabyal A., Persistence and extinction of two prey and one predator system, Int. J. Engg. Sci. & Tech. 2(2) (2010) 174-190.
47. **Kar, T. K**. and Chattopadhyay, S. K. and Agarwal, R. P., Dynamics of an exploited prey-predator system with non-monotonic functional response, Communications in Applied Analysis, 14(1)(2010)21-38.
48. **Kar. T. K.** and Batabyal A., Modeling and analysis of an epidemic model with non-monotonic incidence rate under treatment. J. Math. Res., 2(1) (2010)103-115.
49. **Kar, T. K**. and Batabyal, A., Optimal use of fertilizer to overcome the effects of toxicity inJ. Math. Res., 2(1)(2010), 103-115
50. **Kar, T. K**. and Chakraborty, K., Bioeconomic analysis of fishery with reference to the optimal utilization and management of the resource: An application to the Maryland's Chesapeake Bay oyster fishery, Int. J. Engg. Sci. Tech 1(1)(2009)172-189.
51. **Kar, T. K**. and Misra S., A resource based stage structured fishery model with selective harvesting of mature species, Appl. Appl. Math. 5(1)(2010)42-58.
52. **Kar, T. K**. and Chakraborty, K. Effort dynamics in a prey-predator model with harvesting. Int. J. Inf. & Syst. Sci. 6(3)(2010) 318-332
53. **Kar, T. K**. and Chakraborty, K., A bioeconomic assessment of the Bangladesh shrimp fishery, World J. Modelling & Simulation, 7(1)(2011)58-59.
54. **Kar, T. K**., Chakraborty, K and Pahari, U. K., A prey-predator model with alternative prey: Mathematical model and analysis. Canadian Applied Mathematics Quarterly, 18(2)(2010) 137-168.
55. **Kar, T. K**., Batabyal, A. and Agarwal, R. P., Modelling and analysis of an epidemic model with classical Kermack Mckendrick incidence rate under treatment, J. KSIAM 14 (2010), 1-16

56. **Kar, T. K**. and Chakraborty, K., Bio-economic modelling of a prey-predator system using differential algebraic equations, Int. J. Engg. Sci. Tech., 2(1) (2010) 13-34
57. **Kar, T. K**. and Misra S. and Batanyal A., An analysis for a two species predator-prey system with harvesting, Int.J. Advn Sci.Techn. 1(5)(2010)84-99.
58. **Kar, T. K**. & Chattopadhyay, S. K., A dynamic reaction model of a prey-predator system with stage-structure for predator, Modern Applied Sciences, 4(5)(2010)183-195.
59. **Kar, T. K**., Batabyal, A. and Misra, S., An Analysis for a Two Species Predator-Prey System with harvesting, International Journal of Advances in Science and Technology, 1(5) (2010) 76-90.
60. **Kar, T. K** and Ghosh, B., Bifurcation and feedback control of a stage-structure exploited prey-predator system, Int . J. Engg. Sci. Tech. 2(6) (2010)131-141
61. **Kar, T. K** and Chattopadhyay, S. K., A focus on long-run sustainability of a harvested prey-predator system in the presence of alternative prey, C. R. Biologies 333 (2010) 841-849.
62. **Kar, T. K**. and Batabyal, A., Stability and optimal control of an SIR epidemic model by vaccination, BioSystems 104(2011)127-135.
63. Chakraborty, K. Chakraborty, M and **Kar, T. K**., Optimal control of harvest and bifurcation of a prey-predator model with stage structure. Applied Mathematics and Computation 217(2011)8778-8792.
64. **Kar, T. K**. and Ghorai, A., Dynamic behaviour of a delayed predator-prey model with harvesting, Applied Mathematics and Computation 217(2011)9085-9104.
65. **Kar, T. K**. and Mondal, P. K., Global dynamics and bifurcation in delayed SIR epidemic model, Nonlinear Analysis: Real world Applications 12(2011)2058-2068.
66. Chakraborty, K., Chakraborty, M. and **Kar, T. K**., Bifurcation and control of a bioeconomic model of prey-predator system with time delay, Nonlinear Analysis: Hybrid Systems 5(2011)613-625.
67. **Kar, T. K**. and Ghosh, B., Dynamic analysis of a biological economic model of prey-predator system with alternative prey, International J. Ecological Economics and Statistics 25(2)2012, 12-32.
68. **Kar, T. K**. and Pahari, U.K., Bifurcation and feedback controll in an exploited prey-predator system with stage structure for prey, Journal of Applied Mathematics and Informatics 29(2011)(5/6)1193-1204.
69. Chakraborty, K., Chakraborty, M. and **Kar, T. K**., Regulation of a prey-predator fishery incorporating prey refuge by taxation: A dynamic reaction model. Journal Biological Systems 19(3)(2011)417-445.

70. Chakraborty, K., Das, S. and **Kar, T. K**., Optimal control of effort of a stage structured prey-predator fishery model with harvesting, Nonlinear Analysis: Real World Applications 12(2011)3452-3467.
71. **Kar, T. K**. and Mondal, P., A mathematical study on the dynamics of an eco-epidemiological model in the presence of delay, Applications and Applied Mathematics: An International Journal 7(1)(2012)300-333.
72. **Kar. T. K**., Ghorai, A. and Batabyal, A., Global dynamics and bifurcation of a tri-trophic food chain model. World J. Modelling and Simulations 8(1)(2012)66-80.
73. **Kar T. K**. and Ghosh B., Sustainability and Optimal control of an exploited prey predator system through provision of alternative food to predator, BioSystems 109(2)(2012)220- 232.
74. Chakraborty, K., Jana, S. and **Kar, T. K.**, Global dynamics and bifurcation in a stage-structured prey-predator fishery model with harvesting, Applied Mathematics and Computation 218(2012)9271-9290.
75. **Kar, T. K**. Ghorai, A. and Jana, S., Dynamics of pest and its predator model with disease in the pest and optimal use of pesticide. Journal of Theoretical Biology 310(7) (2012)187-198.
76. Jana, S., and **Kar T. K**., The Optimal allocation of ocean space for the purposes of fishery and ecotourism management, Marine Science 2(5) (2012) 85-93.
77. Chakraborty, K., and **Kar, T. K.**, Economic perspective of marine reserves in fisheries: A bioeconomic model, Mathematical Biosciences 240 (2012) 212-222.
78. **Kar, T. K**. and Mondal, P., Global dynamics of a tuberculosis epidemic model bifurcation and the influence of backward bifurcation, Journal of Mathematical Modelling and Algorithms 11(4) (2012) 433-459.
79. Jana, S., Chakraborty, M., Chakraborty, K., and **Kar, T. K**., Global stability and bifurcation of time delayed prey-predator system incorporating prey refuge. Mathematics and Computers in Simulations 85(2012)57-77.
80. Chakraborty, K., Jana, S., and **Kar, T. K.**, Effort dynamics of a delay induced prey-predator system with reserve, Nonlinear Dynamics 70(2012)1805-1829.
81. **Kar, T. K**. and Mondal, P., Dynamical behaviour of a tuberculosis model with outcome of reinfection and optimal steering, International Journal of Ecological Economics and Statistics 28(1) (2013) 49-79.
82. **Kar, T. K**. and Jana, S., A theoretical study on mathematical modeling of an infectious disease with application of optimal control, BioSystems 111 (2013) 37-50.
83. **Kar, T. K**. Ghorai, A., and Jana, S., Dynamic consequences of prey refuges in a two predator one prey system, Journal of Biological Systems 21(2) (2013) 13500131-135001328.

84. **Kar, T. K**. and Jana, S., Stability and bifurcation analysis of a stage structured predator-prey model with time delay, Applied Mathematics and Computation 219(8) (2013)3779-3792.
85. **Kar, T. K**., Jana, S. and Ghorai, A., Effect of isolation in an infectious disease, International Journal of Ecological Economics and Statistics 29(2)(2013)87-106.
86. **Kar, T. K**. and Ghosh, B., Sustainability and economic consequences of creating marine protected area in multi-species multi-activity context, Journal of Theoretical Biology 318(2013) 81-90.
87. Jana, S. and **Kar, T. K**., Modelling and analysis of a prey-predator system with disease in the prey, Chaos, Solitons and Fractals 47(2013) 42-53.
88. Ghosh, B. and **Kar, T. K**., Maximum sustainable yield and species extinction in ecosystem: Some new results, Journal of Biological Physics 39(3) (2013) 453-467.
89. **Kar, T. K**. and Ghosh, B., Impacts of maximum sustainable yield policy to prey-predator systems, Ecological Modelling 250(2013) 134-142.
90. Pahari, U. K. and **Kar, T. K**., Conservation of a resource based fishery model through optimal taxation, Nonlinear Dynamics 72 (2013) 591-603.
91. Chakraborty, K., Das, K. and **Kar, T. K**., Combined harvesting of a stage structured prey-predator model incorporate cannibalism in competitive environment, C. R. Biologies 336(2013)34-45.
92. Chakreborty, K., Halder, S. and **Kar, T. K**., Global stability and bifurcation analysis of a delay induced prey-predator system with stage-structure. Nonlinear Dynamics 73(3) (2013) 1307-1325.
93. **Kar, T. K**. and Jana, S., Application of three controls optimally in a vector-borne disease - a mathematical study, Communications in Nonlinear Science and Numerical Simulation 18 (2013) 2868-2884.
94. Ghosh, B. and **Kar, T. K**., Possible ecosystem impacts of applying maximum sustainable yield policy in food chain models, Journal of Theoretical Biology 329 (2013) 6-14.
95. Chakraborty, K., Das, S., and **Kar, T. K**., On non-selective harvesting of a multispecies fishery incorporating partial closure for the populations. Applied Mathematics and Computation,221,2013), 581-597.
96. **Kar, T. K**. and Mondal, P. K., Global dynamics of a water-borne disease model with multiple transmission pathways. Applications and Applied Mathematics: An International Journal 8(1) (2012) 75-98.
97. **Kar, T. K**. and Das, U., Regulation of an exploited prey predator system: A dynamic reaction model, International Journal of Ecological Economics and Statistics, 31(4) (2013) 102-121.
98. Jana, S., and **Kar, T. K**., A mathematical study of a prey-predator model in relevance to pest control. Nonlinear Dynamics, 74 (2013) 667-683.

99. Chakraborty, K., Das, K. and **Kar, T. K**., An ecological perspective of marine reserves in prey–predator dynamics, Journal of Biological Physics, 39(4) (2013) 749-776.
100. Ghorai, A. and **Kar, T. K**., Biological control of a prey-predator system in the presence of a super predator. Nonlinear Dynamics, 74 (2013) 1029-1040.
101. Mondal, P. K., Jana, S. and **Kar, T. K**., A theoretical approach on controlling agricultural pest by biological controls. Acta Biotheoretica, 62 (2014) 47-67.
102. **Kar, T. K**. and Das U., Singular induced bifurcation and control of a bioeconomic model of an exploited prey-predator system. Canadian Applied Mathematics Quarterly, 20(3) (2012), 355-373.
103. Das, U., **Kar, T. K**. and Pahari, U. K., Global dynamics of an exploited prey-predator model with constant prey refuge, ISRN Biomathematics, 2013, Article ID 637640, 12 pages.
104. Das, U. and **Kar, T. K**., Bifurcation analysis of a delayed predator-prey model with Holling type III functional response and predator harvesting, Journal of Nonlinear Dynamics, Vol.Article ID 543041, 10 pages, (2014).
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106. Chakraborty K., Chakraborty M. and **Kar T. K**., Sustainable development of European Hake resource: Bioeconomic perspective, Journal of Biological Systems, (2014)1-23.
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13. Das, D. K., Khajanchi, S. and **Kar, T. K.**, Influence of multiple re-infections in tuberculosis transmission dynamics: A Mathematical Approach, 2019 8th International Conference on Modeling Simulation and Applied Optimization (ICMSAO), (2019)1-5.

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Books/chapters publications:

1. Jana, S. and **Kar, T. K.**, Complex dynamics of some ecological systems with special emphasis on epidemiological problems. LAP LAMBART Academic Publishing, 2015.
2. Nandi, S., Jana, S. and **Kar, T. K.**, Bio-Mathematical Modelling under uncertain environment (Chapter 4), Narosa, New Delhi, 2016.
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4. Mondal P. K. and **Kar, T. K.**, Bio-Mathematical Modelling under uncertain environment (Chapter 10), Narosa, New Delhi, 2016.
5. **Kar, T. K.** and Jana, S., Fundamental Engineering Mathematics (CSE & IT), Santra Publication Pvt.Ltd., Kolkata, 2019.
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10. Mandal, M., Jana, S., Adak, S., Khatua, A. and **Kar, T. K.**, Modeling, Control and Drug Development for COVID-19 Outbreak Prevention (Chapter: A Model-Based Analysis to Predict and Control the Dynamics of COVID-19) (87-118), Springer, 2022.
11. Adak, S., Jana, S. and **Kar, T. K.**, Modeling, Control and Drug Development for COVID-19 Outbreak Prevention (Chapter: Investigation of COVID-19 Using an Artificial Intelligence Based Approach) (455-478), Springer, 2022.

Conference/visit/workshop/seminar:

1. Training cum workshop on Unix C, March 7- April 24, 1995. UGC Computer Center, Calcutta University, Kolkata, India.

2. The Role of Mathematics in the New Millennium: Theories and Applications, March 23-25, 2001. Department of Mathematics, Jadavpur University, Kolkata, India.
3. Orientation Program, March 1-30, 2001. Academic Staff College, Calcutta University, Kolkata, India.
4. Refresher Course, Dec 28, 2001-January 20, 2002. Sivatosh Mukherjee Science Centre Kolkata, India.
5. National Seminar on Recent trends in Mathematics and its Applications, Feb 25-26, 2002. Department of Mathematics, Visva - Bharati University, Visva-Bharati, India.
6. Refresher Course, Feb 17 – March 8, 2003. Academic Staff College, Jadavpur University, Kolkata, India.
7. Controllability of a harvested prey-predator system with time delay, September 15-17, 2005. The 15th Annual Meeting of the Japanese Society for Mathematical Biology, Yokohama National University, JAPAN.
8. A bioeconomic model of a single species fishery with marine reserve, December 17-19, 2005. International Symposium on Recent Advances in Mathematics and its Applications, Calcutta Mathematical society, Kolkata, India.
9. Stability, bifurcation and controllability of a harvested prey-predator system with time delay, December 16-18, 2006. International Symposium on Recent Advances in Mathematics and its Applications, Calcutta Mathematical Society, Kolkata, India.
10. International Symposium on Dynamical Systems Theory and its Applications on Biology and Environmental Sciences, March 14-17, 2007. Shizuoka University, JAPAN.
11. Optimization and Control, January 16-20, 2007. IMA Annual Program Year Workshop, University of Minnesota, USA.
12. Participated in International Symposium on Recent Advances in Mathematics and its Applications, Dec 15-17, 2008. Calcutta Mathematical Society, Kolkata, India.
13. Participated in the One Day Colloquium on Mathematical Biology and Ecology, Feb. 20, 2009, Department of Mathematics, Jadavpur University, Kolkata, India.

14. Participated in the National Conference on Mathematical Sciences and Applications: State of the Art, January 14-16, 2010, Deaprtment of Mathematics, Jadavpur University, India.
15. Participated/presented paper "Economic evaluation of Bangladesh Shrimp" in the 17th West Bengal State Science & Technology Congress, held on 4-5 March,2010. Organized by West Bengal State Council of Science and Technology & West Bengal University of Animal and Fishery Science, Kolkata, India.
16. Participated in the International Congress of Mathematicians, 2010 held at Hyderabad during 19-27 August, 2010. India.
17. Presented a paper entitled "Some aspects of bioeconomic modelling of renewable resources" in the "National Seminar on Impact of Emerging Areas of Science & Technology on the Development of Society" organised by Central Calcutta Science and Culture Organisation for Youth in Collaboration with University of Calcutta during 5th & 6th February, 2011 at the Science City Auditorium, Kolkata, India.
18. Participated in the "National Conference on Mathematics and its Applications (NCMA 2010)" Organized by Department of Mathematics, Jadavpur University, Kolkata-700032 during 13-14th January 2011, India.
19. Presented a paper entitled, "Optimal utilization and management of the European Hake fishery" in "International Conference on Mathematical Sciences for Advancement of Science & Technology (MSAST 2010)" organized by Institute for Mathematics, Bioinformatics, Information-technology and Computer-science (IMBIC), Kolkata in collaboration with Indian Statistical Institute during 19-21st December, 2010, India.
20. Participated in the "National Conference on Theoretical Biology and Biomathematics (NCTBB 2010)" Organized by Centre for Mathematical Biology and Ecology, Department of Mathematics, Jadavpur University, Kolkata-700032 in collaboration with Biomathematical Society of India during 15-16th December 2010, India.
21. Presented a paper entitled, "A biological economic model of prey-predator system with alternative prey" in "International Conference on Recent Development in

Mathematical sciences and their Applications (ICRDMSA, 2010)" Organized by Calcutta Mathematical Society, Saltlake, Kolkata-64 during December 09-11, 2010, India.

22. Participated in the UGC sponsored state level seminar on "Recent Trends in Algebra and Its Applications (RTAA-2010)" held at Gokhale Memorial Girl's College, Kolkata, India on 3rd December, 2010, India.
23. Participated in the National Seminar on "National Seminar on Mathematical Modelling of Natural Phenomena (NSMMNP-2010)" organized by Indian Society of Nonlinear Analysis (ISNA) held in Bose Institute, Kolkata, India on 29th October, 2010, India.
24. Participated in the International Conference on Recent Advances in Mathematical Sciences and Applications (ICRAMSA-2011), organized by Calcutta Mathematical Society, held in Kolkata, December 9-11, 2011, India.
25. Participated in the 5th International Conference on "Mathematical Sciences for Advancement of Science & Technology (MSAST 2011)" organized by Institute for Mathematics, Bioinformatics, Information-technology and Computer-science (IMBIC), Kolkata in collaboration with Indian Statistical Institute during 18-20st December, 2011, India.
26. Presented an invited talk entitled "Optimal control applied to biological problems" in CSIR sponsored National Workshop on Recent trends of Mathematics in interdisciplinary research organized by the Department of Basic Science, MCKV Institute of Engineering Liluah, Howrah in collaboration with Central Glass & Ceramic Research Institute, Kolkata, India.
27. Presented a paper entitled "Mathematical analysis of a vector born disease model using three controls" in the "National Seminar on Recent Development in Mathematical Sciences (NSRDMS-2012) organized by Calcutta Mathematical Society, held in Kolkata, April 21-22, 2012, India.
28. Presented an invited talk entitled "Mathematical Epidemiology of Infectious Diseases: Model Building, Analysis and Simulations" in the National Workshop on Numerical Techniques for Chemical and Biological Engineers organized by the

Department of Basic Science and Humanities, College of Engineering and Management, Kolaghat, West Bengal, August 11-12, 2012, India.

29. Presented an invited talk entitled “Sustainability and economic consequences of creating marine protected areas in a multi-species multi-activity context” at Center for Ecological Research, Kyoto University, Japan, October, 2013.
30. Presented an invited talk at Faculty of Environment and Information Sciences, Yokohama National University, Japan, January, 2014.
31. Presented an invited talk at Tsukuba University, Japan, January, 2014.
32. Presented an invited talk at Kyushu University, Japan, February, 2014.
33. Presented talk entitled " Dynamical behaviour of an eco-epidemiological system influenced by the competition among the predators subpopulations" and chairing a session at the International conference on Dynamical systems and Mathematical Biology, November 17-19, 2014, Dept of Mathematics, Jadavpur University.
34. Presented a talk entitled "Modelling and analysis of a two prey one predator system", in the 8th international conference on " Mathematical Sciences for Advancement of Science and Technology" MSAST 2014, organised by the Institute for Mathematics, Bioinformatics, Information Technology and Computer science (IMBIC) December 21-23, 2014.
35. Presented an invited talk in the Bio-Mathematical/Ecological Modelling under DBT Star College Programme, organized by Gope College, West Bengal during 11th February 2015.
36. Presented an invited talk entitled “Modelling, prediction and control of infectious diseases in humans” in the Indian Workshop and Symposium on Modelling Experimentation and Simulation on Complex Systems. Organised by Department of Basic Sciences, Haldia Institute of Technology, Haldia, West Bengal, during 5-7th August 2015.
37. Presented an invited talk entitled “Mathematical modeling and analysis of infectious diseases with application of optimal control” in the UGC Sponsored National Seminar “Recent Trend in Bio-Mathematical Modelling under Uncertain Environment” Organised by Department of Mathematics, Mugberia Gangadhar Mahavidyalaya Purba Medinipur, West Bengal, during 11-12th September 2015.

38. Presented an invited talk in the International Conference on nonlinear dynamics, analysis and optimization (ICNDAQ 2015) during 9th -11th December 2015, organized by Department of Mathematics, Jadavpur University, Kolkata-700032.
39. Presented an invited talk in the National seminar on recent development in mathematics and its applications (NSRDMA - 2016) during January 21-22, 2016 organized by Department of Mathematics, University of Kalyani.
40. Presented a paper entitled "Ecotourism and its consequences in a common fishing ground of interacting species" in the International Conference on Mathematics, Physics and Allied Sciences (ICMPAS) 2016 at Carmel College, Nuvem, Goa, India during March 03-05, 2016.
41. Presented a paper in the 1st Regional Science and Technology Congress 2016, Presidency Division, West Bengal held during 13th and 14th November, 2016 at National Institute of Technical Teachers Training and Research, Kolkata.
42. Participated in the 10th International Conference on Mathematical Sciences for Advancement of Science and Technology, MAST 2016, December, 21-23, 2016, Organized by IMBIC, Kolkata.
43. Presented an invited talk on "Mathematical modeling and analysis of some infectious diseases with application of optimal control" in the UGC sponsored two-day National Seminar on Advanced level of mathematical science, organized by Department of Mathematics, Raja N. L. Khan Womens College and Chandrakona Vidyasagar Mahavidyalaya, during 9th & 10th February, 2017, Midnapore, West Bengal.
44. Presented an invited talk on Qualitative analysis of continuous dynamical systems in the one-day state level seminar on Introduction to dynamical systems, organized by the Department of Mathematics, Vidyasagar Evening College and Indian Society of Nonlinear Analysis, Kolkata, on February 8, 2017.
45. Presented a paper in the 2nd Regional Science and Technology Congress (Southern Region) 2017, West Bengal held during 14th and 15th December, 2017 at University of Kalyani.

46. Presented a paper "Transmission dynamics of tuberculosis with multiple re-infections" in the International Conference MSAST 2017 December 21-23, Organized by IMBIC, Kolkata.
47. Presented an Invited talk on "Biological conservation through marine reserve in the presence of alternative stable states" in the National Conference on Mathematical and Theoretical Biloogy, 2018, Organized by Department of Mathematics, Jadavpur University and Centre for Mathematical Biology and Ecology, Kolkata, March 22-23. 2018.
48. Presented a paper "Modelling the influence of establishing marine Protected Areas on Predator-Prey Communities with Alternative Stable States" in the 7th Annual International Conference Computational Mathematics, Computational Geometry and Statistics (CMCGS) 2018, Organized by Global Science and Technology Forum (GSTF), **Singapore**, April 9-10. 2018.
49. Presented an invited lecture entitled "A comparative analysis of yield and resilience in exploited food chain systems" in the Online Faculty Development Programme on Mathematical Biology and Biostatistics organized by Amity University, Kolkata from July 26th to July 30th, 2021.
50. Presented an invited lecture entitled "Role of mathematical modelling and some simple applications in population dynamics" in the Online Faculty Development Programme on Physical Systems and Mathematical Modelling (PSMM-2022) organized by Department of Mathematics and Physics, NIT, Calicut from January 27th to January 28th, 2022.
51. Presented an invited lecture entitled "Dynamical systems: Some basic theories and applications" in the Online Faculty Development Programme on Physical Systems and Mathematical Modelling (PSMM-2022) organized by Department of Mathematics and Physics, NIT, Calicut from January 27th to January 28th, 2022.
52. Presented an invited lecture entitled "Dynamical systems: Some basic theories and applications" in the programme EAMSEST2022 (Short term Training Program) (STTP) entitled "Emerging Applications of Mathematics and Statistics in Engineering Science and Technology" organized by NIT Rourkela from May 9th to May 15th, 2022.

53. Presented an invited lecture entitled "Role of mathematical modelling on infectious diseases in humans" in the two-day workshop on Mathematical Ecology and Epidemiology organized by Department of Mathematics, IIT Indore from June 17th to June 18th, 2022.
54. Chairing a session on "MATHEMATICAL MODELLING" at the International Conference on Mathematical Analysis and Applications, 2022 Organized by Department of Mathematics, University of Kalyani from June 28th to June 29th, 2022.
55. Presented an invited lecture entitled "Explicit impacts of harvesting on population models" in the Training-cum-Workshop on Mathematical Biology (TWMB-2022) organized by Department of Mathematics, University of Kalyani sponsored by SERB from September 19th to September 20th, 2022.
56. Attended as a special guest to the "One day symposium on the quantitative biology" on 19th January 2023, organized by AERU, ISI Kolkata.

Membership:

(i) Joint Secretary Biomathematical Society of India
(ii) Executive member of the Calcutta Mathematical Society, Kolkata, India
(iii) Member of the Indian Statistical Institute (ISI), Kolkata, India

Editorial board member :

(i) Journal of Fisheries and Aquatic Sciences (Ex)
(ii) Research Journal of Environmental Sciences (Ex)
(iii) Journal of Applied Sciences (Ex)
(iv) Journal of Advanced Research in Dynamical and Control Systems (Ex)
(v) International Journal of Biomathematics and Systems Biology
(vi) Mathematics and Computers in Simulation (MATCOM), Elsevier

Reviewers of Journals:

1. Mathematical Analysis and Applications
2. Turkish Journal of Mathematics
3. Journal of the Franklin Institute
4. Bulletin of Pure and Applied Mathematics
5. Journal of Applied Mathematics and Computing
6. Journal of Biological Dynamics
7. Nonlinear Analysis: Real World Application
8. Nonlinear Analysis: Theory, Methods and Applications
9. Journal of Biological Systems
10. Ecological Economics
11. AMSE Periodicals
12. International Journal of Mathematical Education in Science and Technology
13. Journal of Computational and Applied Mathematics
14. Applied Mathematical Modeling
15. Nonlinear Analysis: Modeling and Control
16. Communications in Nonlinear Science and Numerical Simulations
17. International Journal of Biomathematics
18. Ecological Modelling
19. Research Journal of Environmental Sciences
20. Applied Mathematics and Computation
21. Journal of Computational Science
22. Computer Mathematics and its application
23. International Journal of Engineering, Science & Technology
24. Journal of Computational Science
25. Journal of Fisheries and Aquatic Sciences
26. Journal of Mathematical Biology
27. International Journal of Mathematics and Soft Computing
28. Mathematics and Computers in simulation
29. BioSystems
30. Journal of Inequalities and Applications
31. Applications and Applied Mathematics: An International Journal

32. Nonlinear Dynamics
33. Abstract and applied analysis
34. Discrete dynamics in nature and Society
35. Differential equations and dynamical systems
36. International Journal of Dynamical Systems and Differential Equations
37. Journal of control and decision
38. Acta Biotheoretica
39. Mathematical Biosciences
40. Journal of Theoretical Biology
41. Journal of Nonlinear Dynamics
42. Optimal control: Applications and Methods
43. Chaos, Solitons and Fractals
44. Ecological Genetics and Genomics
45. Physica Scripta

Research Collaborations:

I have some collaborations both at national and international level. At international level, I am collaborating with Yokohama National University, Japan; Kyoto University, Japan; Kyushu University, Japan; Florida Institute of Technology, USA; Institute R. Boskovic, Croatia. At national level, I am collaboration with Ocean Sciences Group, Indian National Centre for Ocean Information Sciences, Hyderabad; National Institute of Technology, Meghalaya; Jadavpur University, Kolkata.

M. Sc. Dissertations:

Dibyendu Dey, Gadadhar Mahata, Prasanta Kr. Das, Sowmik Biswas, Saikat Sarkar, Rikhia Dhar, Kajal Hari, Sanjay Nandi, Srabani Guria, Ashmantara Khatun, Dipak Bera, Malabika Panda, Moumita, Sudipta Pain, Soumita Biswas, Devkumar Pal, Bishal Sharma, Swarnanshu Nandi, Rita Chowdhury, Sourav Saha, Piasha Koley, Kanisha Pujaru, Anuran Maity, Aritra Pal,

Dhrubajyoti Dhara, Souman Manna, Shubhraneel Bera, Gourav Kumar Singh, Tanmoy Dhara, Monosree Gorai, Jayashri Hazra, Kousik Kar

Other information (if any):

1. Worked as Ph.D. thesis examiner of several University/Institute.
2. Worked as project evaluator for different funding agencies.
3. Worked as selection committee member of different University/Institute.