



National Key Basic Research Program of China (973 Program)

Impacts of Reclamation Activities on Coastal Wetlands in China's Major Estuarine Deltas: Mechanisms and Ecological Restoration (2013-2017)



**Beijing Normal University (BNU)
Northeast Institute of Geography and Agroecology,
Chinese Academy of Sciences (IGA, CAS)
Dalian University of Technology (DUT)
Fudan University (FDU)
Nanjing University (NJU)
Peking University (PKU)
Qingdao University of Science & Technology (QUST)
North China Electric Power University (NCEPU)**

Funded by:

**Ministry of Science and Technology of the
People's Republic of China (MOST)**

Background

Reclamation has long been a widespread practice as humans increasingly use and dominate ecosystems on Earth, particularly in developing regions. In China, reclamation has been widely adopted for land expansion in coastal regions, where population concentrates and there is an increasing shortage of land for economic development.

Since the founding of the New China, reclamation has been adopted to develop:

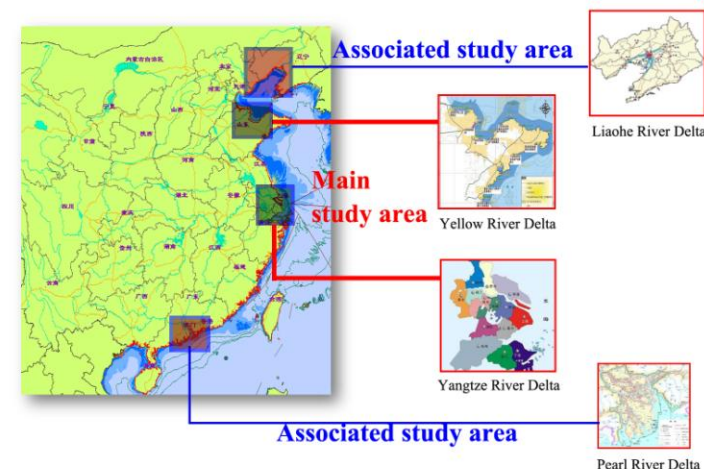
- (1)salt production pans at early stages of the founding of the country,
- (2)agriculture in the 1960s and 1970s,
- (3)mariculture in the 1980s and 1990s,
- (4)industrial and recreation zones in the 21st century.

Over the past ten years, 50% of coastal wetlands have been lost due to reclamation.

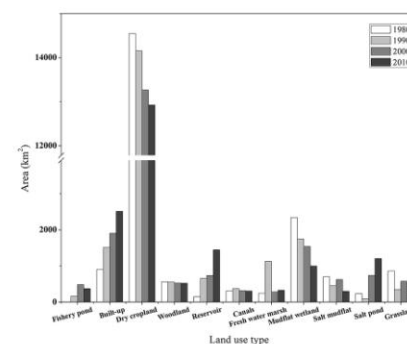


Project Area

This project focuses on the four large-river deltas in China where reclamation activities have caused series of environmental and ecological issues that threaten coastal wetlands.



Yellow River Delta

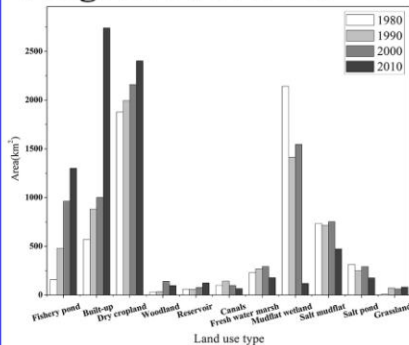


Dry cropland and mudflat wetland decreased from 1980 to 2010. Built-up, fishery pond and salt pond kept increasing while woodland and river canals remained relatively stable. Conversion matrix analysis indicated that most of the lost dry cropland converted into built-up, while the lost mudflat wetland across the Yellow River delta was converted into fishery and salt pond.

Project Area

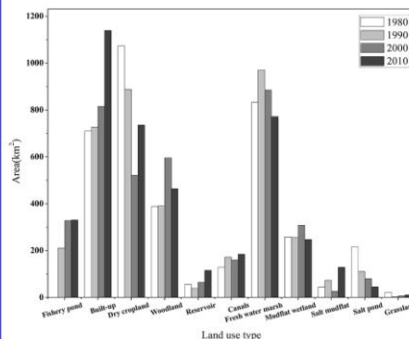
Key scientific questions and goals

Yangtze River Delta



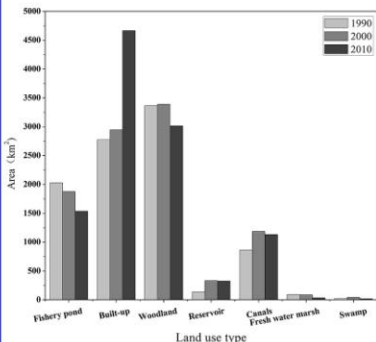
The Yangtze River delta experienced intensive land use/land cover change from 1980 to 2010. Large area of dry cropland was converted into built-up area; salt mudflat and salt pond increased slightly; mudflat wetland fluctuated.

Liaohe River Delta



Intensive land use/land cover change was also observed across the Liaohe River delta from 1980 to 2010. Large area of dry cropland was converted into built-up area. Fishery pond, reservoir and built-up kept increasing while salt pond kept declining. Woodland, river canals remained relatively stable.

Pearl River Delta



The Pearl River delta experienced similar land use/land cover change as that in other three river delta regions during 1990-2010. Fishery pond was converted into built-up area. Canals and reservoirs kept increasing while woodland and freshwater marsh showed an overall decrease trend.

Key scientific questions:

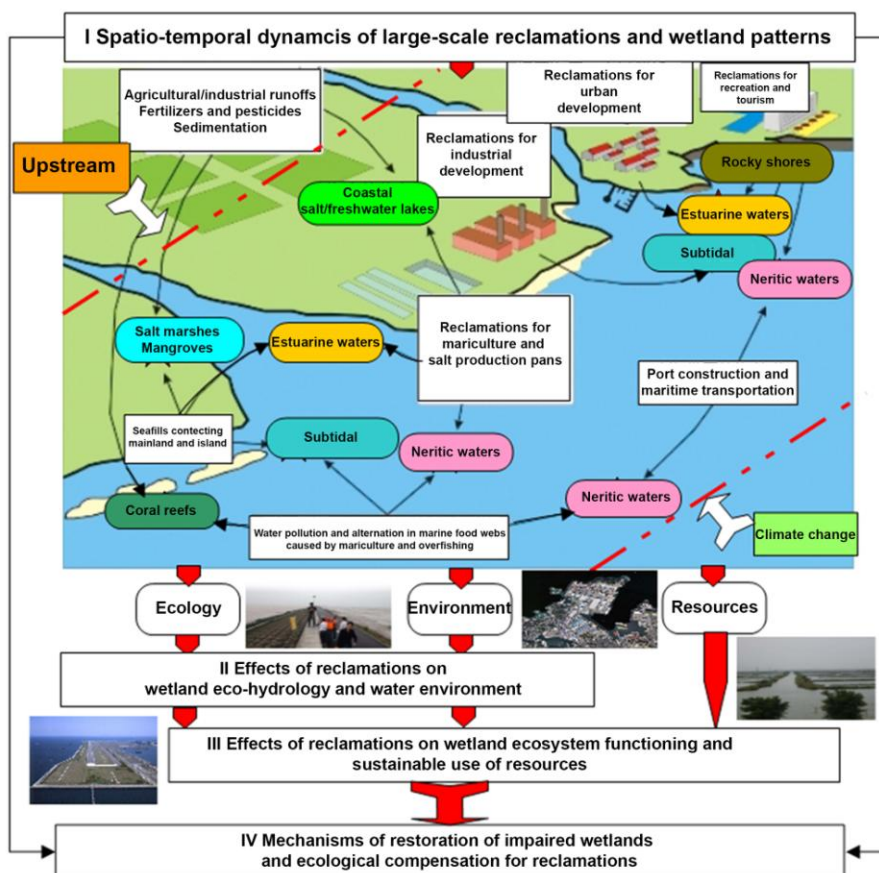
1. Mechanisms underlying the effects of large-scale reclamation activities on eco-hydrological processes and water environmental effects in coastal wetlands,
2. How coastal wetland ecosystem functioning responds to and is altered by reclamation activities,
3. Mechanisms of integrated coastal ecosystem management in response to reclamations.

Project goals:

1. To provide guidance for the scientific planning and implementation of reclamation activities,
2. To establish procedures for restoration of damaged coastal wetlands and ecological compensation,
3. To foster outstanding talents and an innovative, multidisciplinary team of leading scientists.

Subjects

The project aims to scientifically manage reclamation activities, establish procedures for restoration of impaired coastal wetlands and ecological compensation, and coordinate socio-economic development and environmental conservation. This project is conducted in four subjects as following:



Topics

In accordance with above four subjects, this project has 6 topics:

Topic 1

Tempo-spatial dynamics of large-scale reclamation and its impact on wetland ecological patterns

Institution:

Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences
North China Electric Power University
Leading scientist: Prof. Baixing Yan

Topic 2

Impact mechanism and simulation of reclamation on wetland aquatic ecological processes

Institution:

Beijing Normal University
Peking University
Leading scientist: Prof. Tao Sun

Topic 3

Aquatic environmental effects and modeling of reclamation impact on coastal wetland

Institution:

Dalian University of Technology
Peking University
Qingdao University of Science & Technology
Leading scientist: Prof. Jingwen Chen

Topic 4

Responses of ecological integrity to reclamation and conservation of biodiversity in coastal wetland

Institution:

Fudan University
Leading scientist: Prof. Bo Li

Topic 5

Effect of reclamation on wetland ecosystem services and sustainable utilization of resources

Institution:

Nanjing University
Beijing Normal University
Leading scientist: Prof. Shuqing An

Topic 6

Ecological restoration and compensation for the damaged wetlands induced by reclamation

Institution:

Beijing Normal University (leading)
North China Electric Power University
Leading scientist: Prof. Baoshan Cui
(Chief scientist)



International collaboration appeal

Contact us

As the chief project organizer, Beijing Normal University (BNU) cordially appeals for international collaborators to join this project. It is available to organizations and individuals interested to proceed with the project. Also, We (BNU) expect to establish long-term international academic linkages and research collaborations through this project. We propose three forms of collaboration:

Research and academic exchange: We (BNU) expect to make research collaboration in the field of coastal wetland restoration/conservation and invite experienced scientists to join the project as international scientific consultants or research collaborators during the project period. We also expect collaborators could join the co-symposium or international conference organized by BNU.

Research paper publication: Original, innovative research papers that distill the most important findings, visual information, and executive alternatives on wetland restoration are one of the major project deliverables. Thus, we invite collaborators to co-publish high-level research papers (esp. co-organizing special issues) in those international top or flagship academic journals.

Student training and education: Quite a number of master & PhD students of BNU are involved and undertaking major basic research tasks of the project, we also welcome international master & PhD students from our collaborators to participate the project. We look forward to establishing a long-term mechanism for international student training and exchange.

973 Program office

Associate Professor Qiang Liu

No. 19, XinJieKouWai St., HaiDian District,
Beijing 100875, P. R. China

Email: coastalwetland@163.com

Tel/ Fax: 86-10-58802771

International collaboration contactor

Associate Professor Xiaowen Li

No. 19, XinJieKouWai St., HaiDian District,
Beijing 100875, P. R. China

Email: lixw@bnu.edu.cn

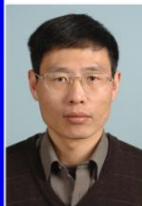
Tel/Fax: 86-10-58802797

Online :

<http://cwr.bnu.edu.cn>



BNU Delegation



BAOSHAN CUI: Professor/Dr., Deputy Director of School of Environment of BNU, Project leader and Chief Scientist of 973 Program, research interests include wetland ecology and hydrology, wetland restoration, and wetland management.
Email: cuibs@bnu.edu.cn



XINHUI LIU: Professor/Dr., Deputy Director of School of Environment of BNU. Keystone research scientist of 973 Program, specialized in environmental chemistry of organic pollutants and environmental risk assessment in water environment.
Email: xhliu@bnu.edu.cn



TAO SUN: Professor/Dr. of School of Environment of BNU. Sub-project leader of 973 Program, research interests lie in environmental flow assessment and hydro-ecological modeling of coastal wetlands & estuaries.
Email: suntao@bnu.edu.cn

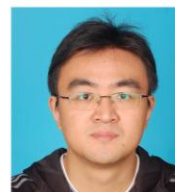
BNU Delegation



XIAOWEN LI: Associate Professor/Dr. of School of Environment of BNU, keystone research scientist of 973 Program, research interest falls into landscape ecology, habitat modelling and large-scale conservation planning in freshwater, coastal & estuarine wetlands.
Email: lixw@bnu.edu.cn



QIANG LIU: Associate Professor/Dr. of School of Environment of BNU, keystone research scientist of 973 Program, researches interest focus on eco-hydrological process and modeling of coastal & estuarine wetlands and its response to climate changes.
Email: liuqiang@bnu.edu.cn



DONGDONG SHAO: Associate Professor/Dr. of School of Environment of BNU, keystone research scientist of 973 Program, research fields include environmental fluid mechanics, hydrodynamic and water quality modeling of rivers, lakes and coastal wetlands.
Email: ddshao@bnu.edu.cn

