### British Council ISPF EC Fellows: Analytics for flood resilience and sustainable transport

Prof. Maria Paola Scaparra Kent Business School

GCRF

SIRI

CREST-OR



BRITISHCOUNCIL

**Kent Business School** 

#### **KBS Projects in Vietnam**

- GCRF-OSIRIS
  - Interdisciplinary project to minimize flood impacts in Vietnam cities



#### CREST-OR

 Multi-institution partnership to build OR capacity in Southeast Asia





University of Kent





Engineering and Physical Sciences Research Council





#### Optimal Investment Strategies to Minimize Flood Impact on Road Infrastructure Systems in Vietnam









### **The GCRF-OSIRIS Team**

University of Kent





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## **Optimising Flood Mitigation Investments**

#### Decisions

Which flood mitigation projects (e.g., lake restoration, pipes upgrade) should be implemented? When?

#### **Objectives**

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 Minimize flood impacts on <u>road congestion</u> and <u>damage</u> in different future flood scenarios













# **Decision Support System**







Before projects implementation

After projects implementation



# GCRF-OSIRIS open questions leading to research area 1

- Can we use AI to predict future flood scenarios?
- What about rural areas?
- Are there other performance criteria?
- How can we better capture flood impacts on women?
- How can we involve stakeholders in a more structured way?

Research Area 1. Flood Resilience: Integrating artificial intelligence, analytics and participatory approaches to drive inclusive flood mitigation decisions in Vietnam's urban and rural areas.





Engineering and Physical Sciences Research Council

#### Improving Community Resilience & Sustainability Through Operational Research Capacity Building in Southeast Asia











# From GCRF-OSIRIS to CREST-OR

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- Waste
- management
- Water distribution
- Public transport
- Traffic / congestion
- Multi-modal systems
- Rural roads

Smart Cities

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- Emergency Response
- Recovery / rebuild

Disaster Management

- Food production resiliency
- Climate shocks
- Land use

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University of **Kent** 

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Engineering and Physical Sciences Research Council

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**SEA Development Challenges** 

#### **Southeast Asia Team**

- 8 Universities in Cambodia, Laos, Indonesia, Myanmar and Vietnam
- 9 Academics
- 8 Early Career Researchers (ECRs)
- Asian Management and Development Institute (AMDI)

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![](_page_10_Figure_6.jpeg)

# **Capacity Building Activities**

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#### **ECRs training**

- NATCOR Courses
- Grant Writing Workshop
- KBS Lunch and Learn events
- Padlet Training
- Auditing analytics courses

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### Southeast Asia OR Network (SEAORN)

Increase OR knowledge

University of

- Learn how to apply OR to SEA challenges
- Support stakeholders to achieve SDGs
- Develop solidarity within the SEA OR community
- Serve as a networking and learning platform for ECRs
- Support the establishment of OR Societies linked to IFORS and APORS

SEA SOUTHEAST ASIA ORN OPERATIONAL RESEARCH NETWORK

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#### Website: https://seaorn.net/

![](_page_12_Picture_10.jpeg)

# ECR proposals leading to research area 2

- 1. Inventory control for disaster relief in West Java, Indonesia
- 2. Using OR to improve drainage system resilience to climate change in Pakse, Laos
- 3. Strategic planning to improve the efficiency of the multimodal transportation system of Can Tho City, Vietnam
- 4. Optimization issues in forest management in Vietnam
- 5. Vegetable crops optimization to improve production planning for small household farmers in Cambodia

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# Sustainable transport in the Mekong Delta

#### **Research questions**

- 1. How can the bi-modal (waterways and roads) transport system in the Mekong Delta be improved?
- 2. Which infrastructure investments would have the greatest impact on people mobility and logistics operations efficiency?
- 3. How can the transport system be made more climate-resilient in view of future climate change scenarios?
- 4. Which performance criteria should be used to measure the economic, environmental and social sustainability of the bi-modal transport network?

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BRITISH COUNCIL

Research area 2. Sustainable transport: Optimizing infrastructure investments through data-driven analytics for sustainable mobility, logistics and climate-resilient transport in the Mekong Delta, Vietnam.

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### What are we looking for?

**Person specification** (not exhaustive):

- PhD obtained or close to completion in OR / Analytics / Management Science / Applied Mathematics / Computer Science or related discipline
- Knowledge of mathematical optimisation (e.g., combinatorial, robust, stochastic)
- Knowledge of optimisation software (Cplex, Gurobi)
- Computer programming experience
- Strong analytical and problem-solving skills
- Excellent communication and interpersonal skills
- Experience working with stakeholders and/or on multidisciplinary projects

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Willing to contribute to the SDGs in Vietnam!

### Kent Business School

#### • Four departments

- Accounting and Finance
- Marketing, Entrepreneurship and International Business
- Leadership and Management
- Analytics, Operations and Systems (DAOS)
- Academic excellence
  - Top 25 in the UK for Business and Management (Guardian Ranking 2024)
  - Accreditations and professional recognition a leading 'triple accredited' business school (AACSB, EQUIS and AMBA).

#### Corporate connections

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- Strong links with global and local businesses
  + ASPIRE and the Business Start-Up Journey.
- Knowledge Transfer Partnerships (KPTs)

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### Programmes

#### • Undergraduate

 A&F; Finance and Investment; International Business; Management (Business Analytics); Management (People Management); Marketing

• Postgraduate

- Business Analytics; Digital Mktg and Analytics; Marketing; Finance; Finance and Management; Finance, Investment and Risk; FinTech; Healthcare Mgmt; HRM; IBM;
   Logistics and Supply Chain
- MBA
- Postgraduate (Research)
  - Accounting; Finance; Business Analytics; Management; Marketing; OB & HRM; Operations Research

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# Campus Locations

**Canterbury and Medway** 

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# Thank you!

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![](_page_19_Picture_11.jpeg)

Maria Paola Scaparra

![](_page_19_Picture_13.jpeg)

https://research.kent.ac.uk/gcrf-osiris/

![](_page_19_Picture_15.jpeg)

https://research.kent.ac.uk/crest-or/

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# **CREST-OR Objectives**

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Develop OR academic leaders and ECRs

Identify key challenges in each country

Develop a portfolio of research proposals

Create a self-sustaining OR community

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