Assessment of Options and Opportunities for Riverine Waste Collection Technologies in Southeast Asia

Development of a Decision Support Framework (DSF)

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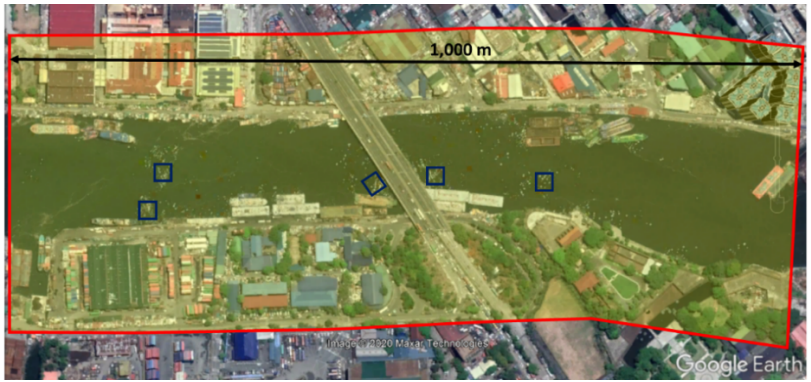
Context of WB plastics engagement

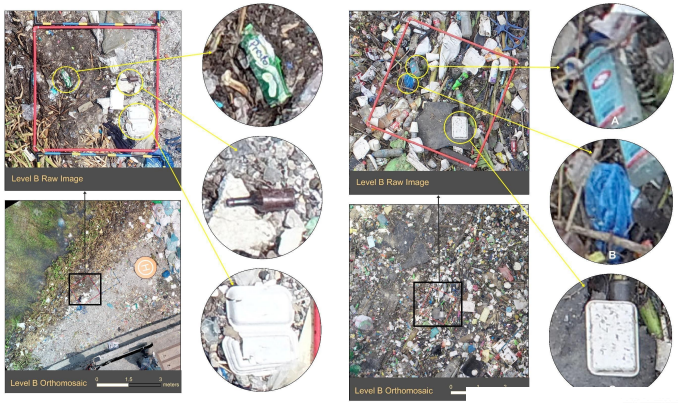
- World Bank has a **global commitment to reduce plastics pollution.** More than 60 engagements in all regions. **FY21 marine plastics portfolio surpassed $5 billion**, supporting investments and policy reforms on circular economy.
- **PROBLUE**, a multi-donor trust fund that focuses on marine plastic pollution, has committed more than US$40 million as of March 2022.
- Key purpose of activities: **preventing land-based and marine sources of plastic pollution**
- The World Bank is **working with multiple countries in Southeast Asia** as well as with the **ASEAN secretariat** on reducing the amount of plastic waste leakage
- Analytical work on **key sources, amounts and types of plastic waste leaking into waters**
- Advisory services to **inform the development of policies and investments; the development of plastic action plans and policy options** aiming to reduce plastic waste
- Financing of **environmental and waste management projects** including activities on reducing plastics pollution

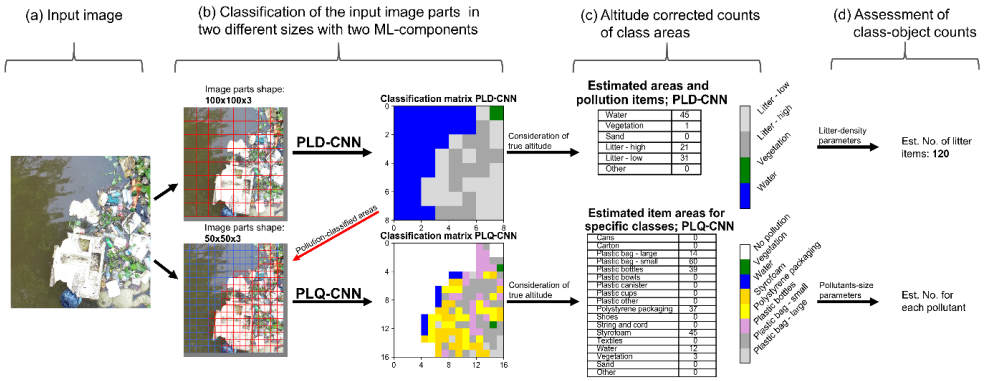
Example: Plastics pollution diagnostics

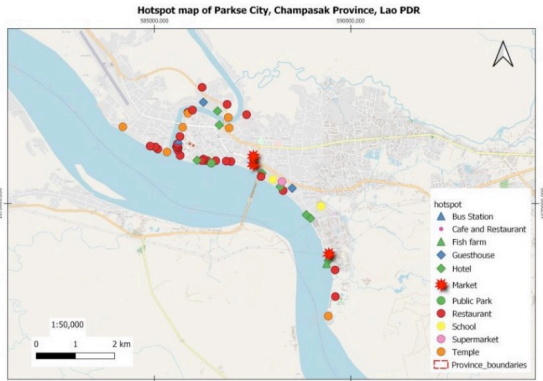
Identification of priority plastics and pollution hotspots

Innovative approaches based on remote sensing with automated detection and analysis of plastics (drones along riverbeds and beaches; cameras on bridges; machine-learning based automated analysis)









Context of Decision Support Framework on Riverine Plastic Collection Technologies

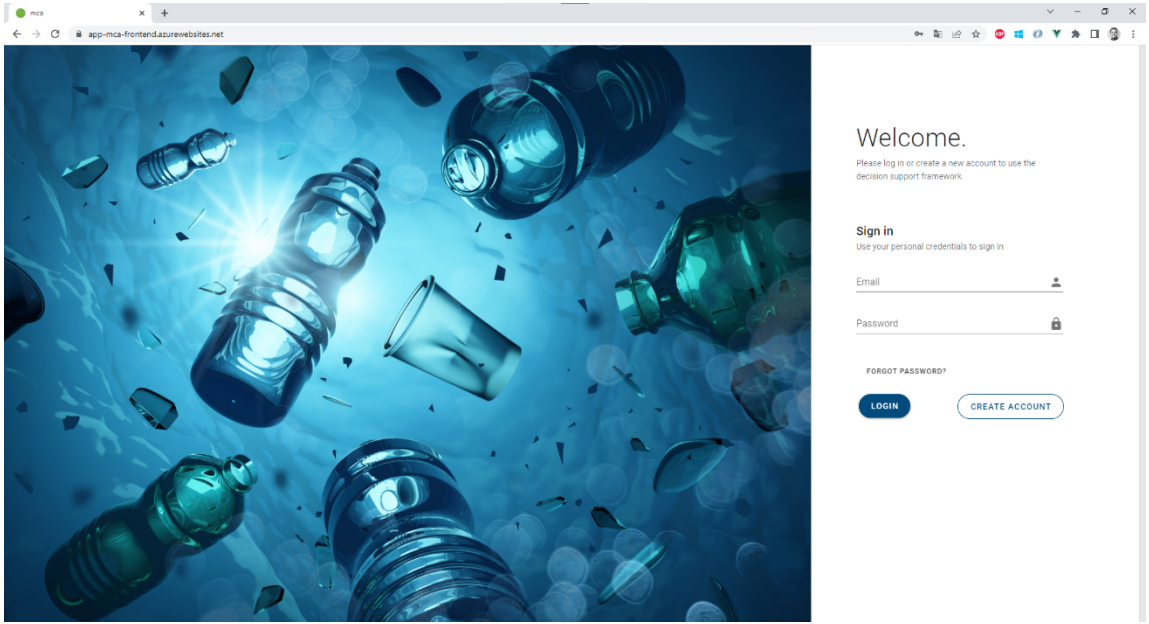
- To overcome the problem of marine plastic pollution, an **integrated approach is required**, aiming at the reduction of (single-use) plastics; the improvement of plastic waste collection; the increase of re-use and recycling; and others.
- **Investments throughout the whole plastic value** chain are needed. The ASEAN **Regional Action Plan for Combating Marine Debris**, includes (i) Reduce inputs in the system; (ii) Enhance collection and minimize leakage; (iii) Create value for waste reuse
- Current estimations show **over 2 tons of plastic waste are leaking into the oceans every minute, requiring quick actions**. Land-based sources account for approximately 80% of marine plastic debris.
- **Technologies for collection of plastics from waterways** can play a key role in significantly reducing the amount of marine plastics within a very short time.
- This **Decision Support Framework (DSF)** has been developed to support governments in identifying effective riverine waste collection technologies based on location specific characteristics and conditions
- The technologies in the DSF's database are selected based on conditions in Southeast Asian countries. **As such the DSF assists users in taking informed action and investments on plastic waste collection** for their most polluted rivers.

Purpose of the DSF

- Based on results from plastic diagnostics on plastic pollution and hotspots
- The DSF aims to assist government agencies to identify potentially suitable riverine waste collection systems for their specific river location.
- The DSF is a web-based information tool that hosts a database with the details of ~90 riverine waste collection technologies that can be filtered on specific selection criteria
- Information on the suitable technologies are made available through a user friendly user interface.
- Report with detailed information and user manual available on webs

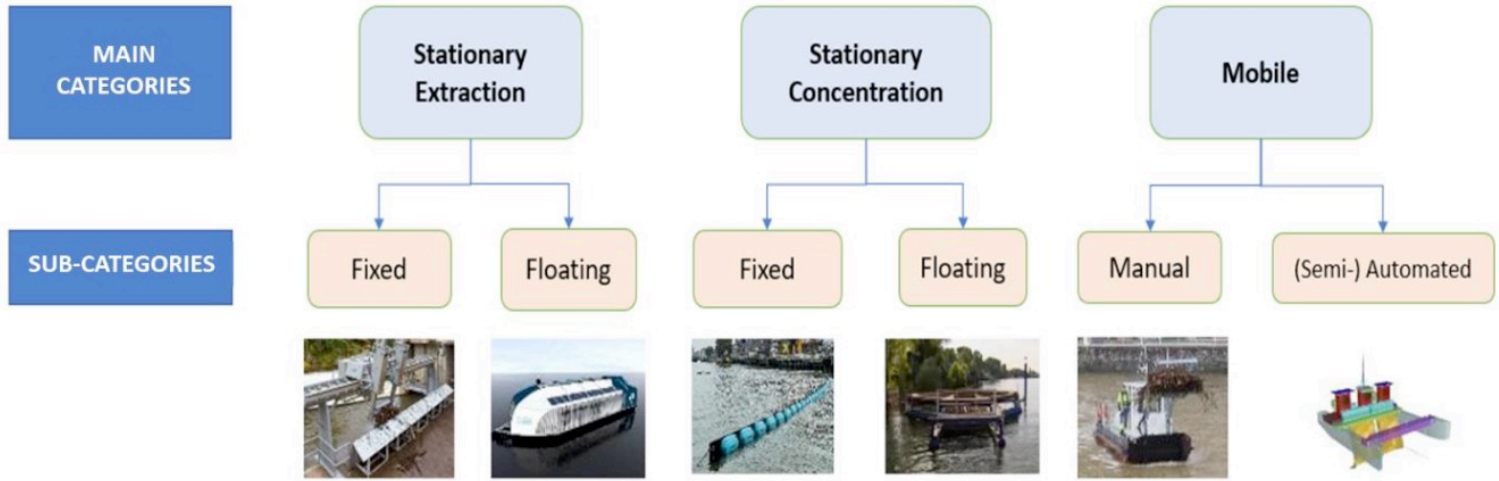
Access to the Decision Support Framework

- The system is World Bank-funded, free to use and publicly accessible for everyone through: https://riverine-plastic-waste-collection-technology.com/

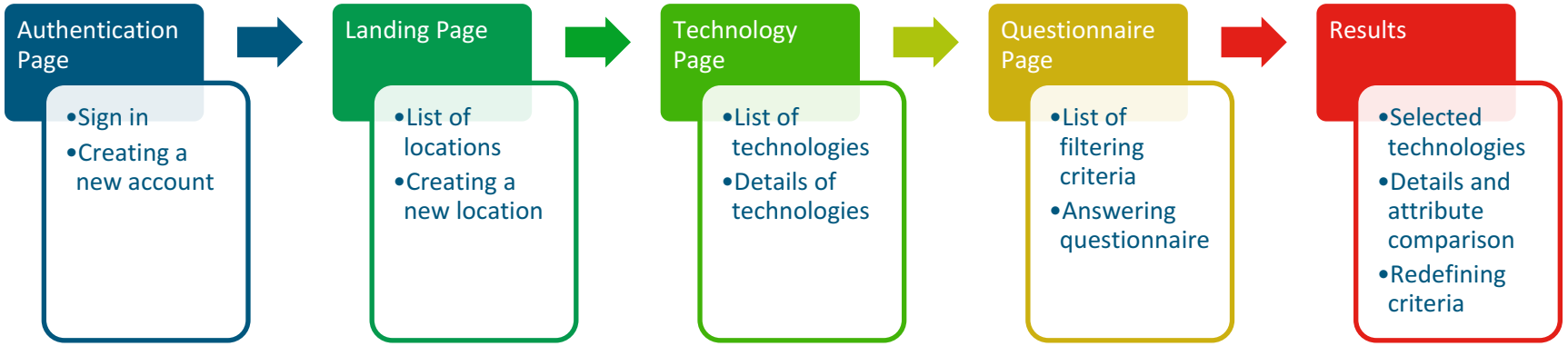


Categories of collection systems

- ~90 technologies are currently included in the supplier database
- These technologies passed a Technological Readiness Level (TRL) equal or above 7, and are relevant for riverine river systems in Southeast Asia.

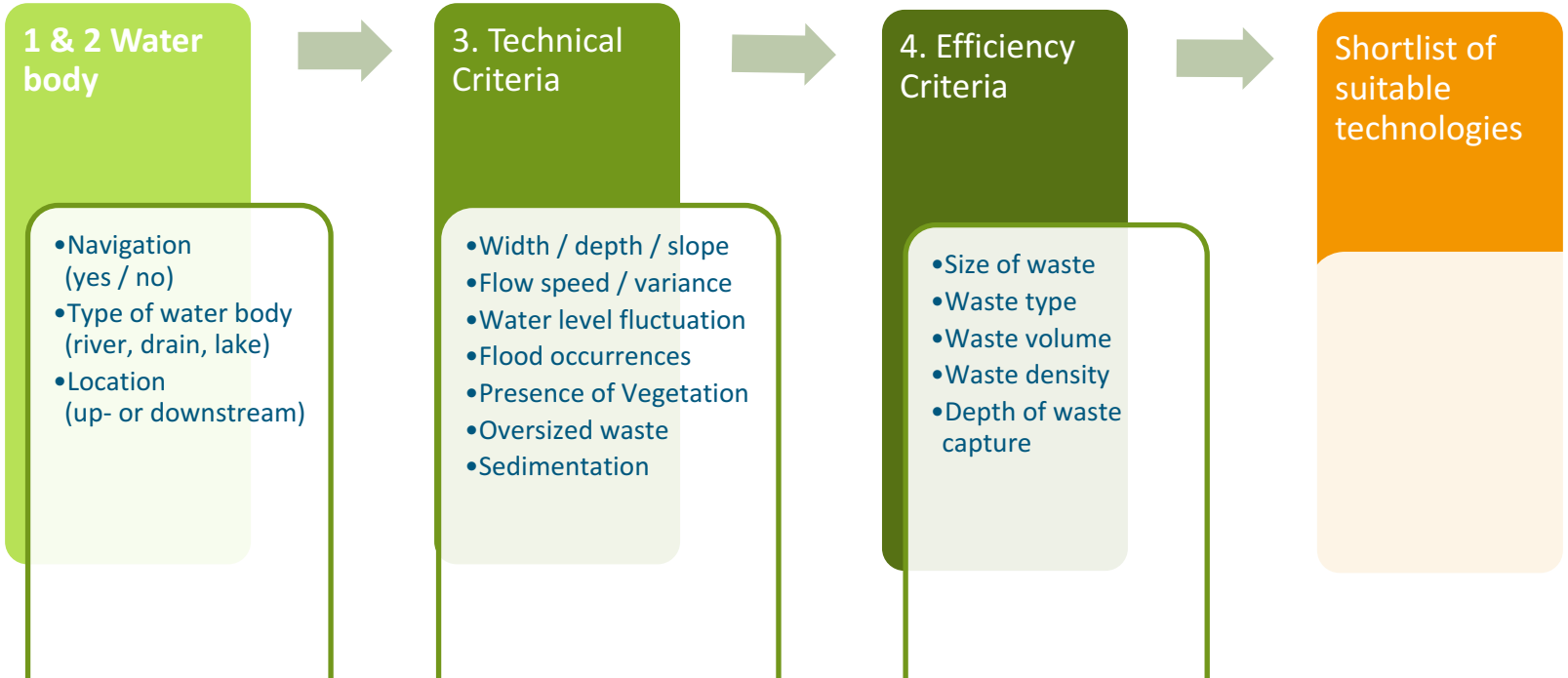


Demo Flowchart



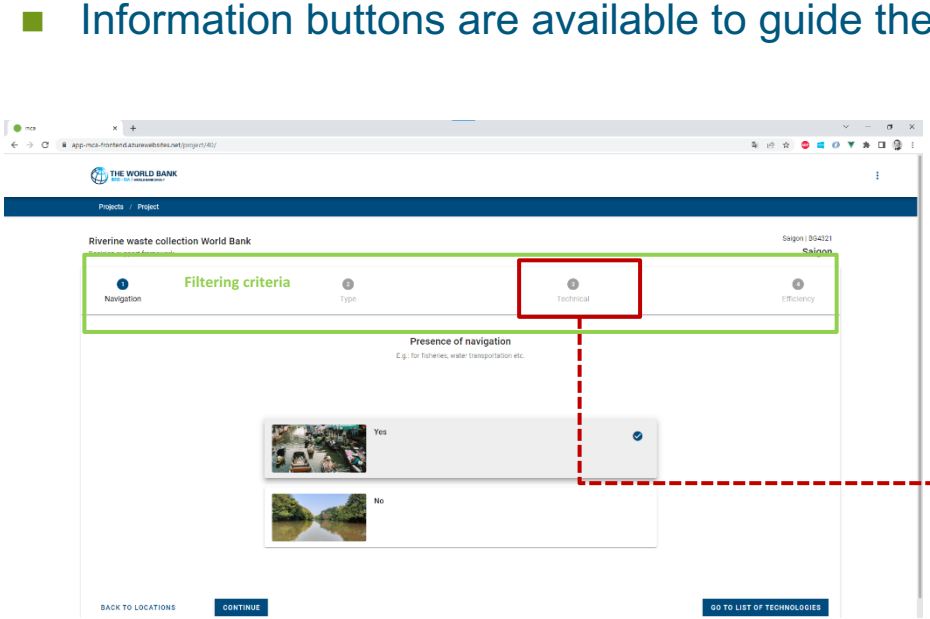
Selection of Technologies

- Riverine waste collection technologies are filtered based on selection criteria that are grouped under 1. water body, 2. technical and 3. efficiency criteria.
- The criteria were selected based on a) a literature review, b) the outcome of the country surveys in Southeast Asia and c) the consultant's previous experience.



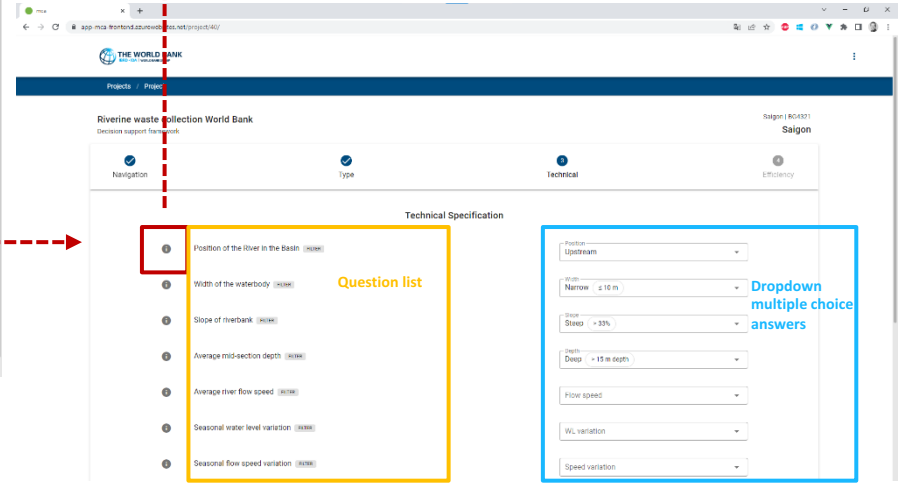
Questionnaire Page

- When selecting a location, the users will be directed to the questionnaire
- There the filtering criteria can be filled by answering the questions
- Information buttons are available to guide the users



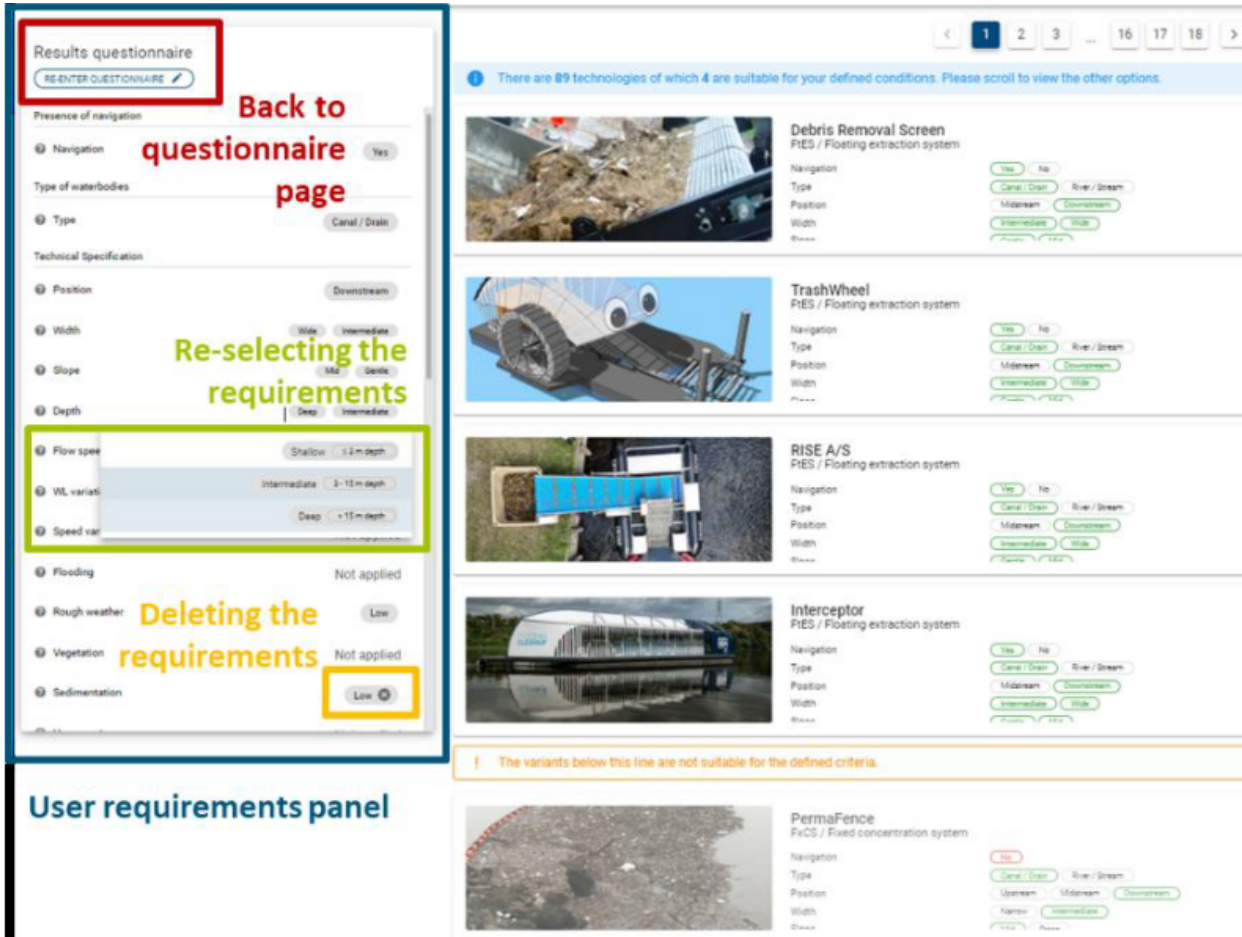
Information panel

Position of the River in the Basin FILTER



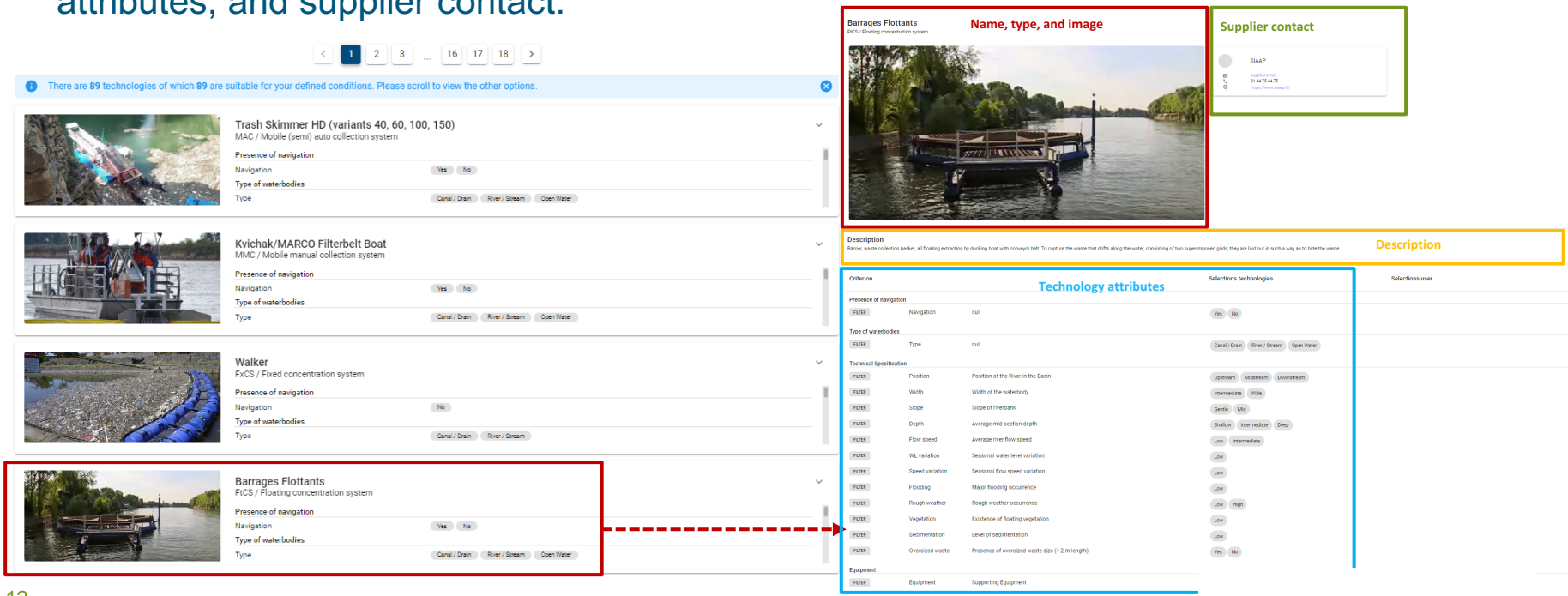
List of technologies

- The full list of technologies is being displayed and sorted based on their suitability for the user's selections.
- The user selections are visible in the side bar and can be changed to quickly re-filter the full list



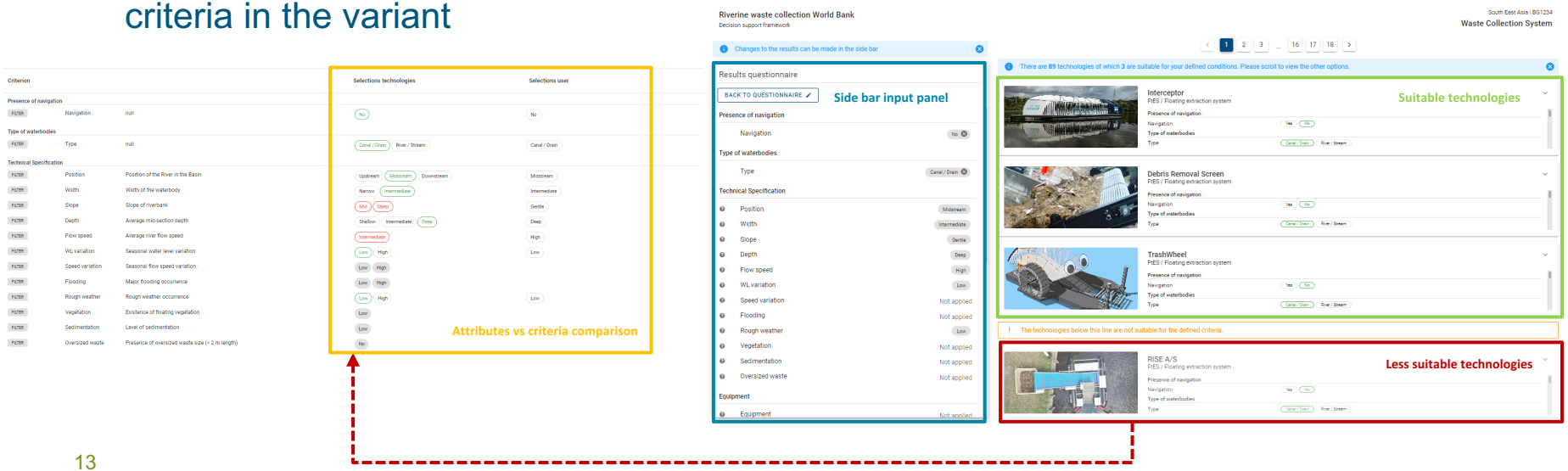
Technology page

- List of available riverine waste extraction technologies in the database
- Details of technologies, including: name, picture, type, description, technology attributes, and supplier contact.



Results: filtered technologies

- The list of filtered technologies is being displayed and sorted based on their suitability for the user selections.
- The user selections are visible in the side bar and can be changed to quickly re-filter the full list
- The suitability of the technologies can be noticed from the colours of the chips for each criteria in the variant



Considerations and pre-conditions

- In parallel to applying technical and efficiency criteria, an assessment of the enabling environment is recommended for details assessment and feasibility study. Key elements include:
  - Financing arrangements particularly for operations and maintenance (including upstream/downstream beneficiaries)
  - Institutional and operational arrangements with integration of river-based and land-based collection systems and service providers
  - Environmental and social impacts
  - Permits and regulations
  - Treatment and disposal in line with national waste management regulations
  - Support infrastructure for transport, treatment/recovery and disposal
  - …

Q&A

- Any feedback is appreciated, especially related to:
  - User-friendliness of the DSF
  - Applicability of the filtering criteria
  - Any missing technologies or information on the technologies

- The DSF will be maintained and updated based on your user-feedback. User-feedback can be submitted through: ksattler@worldbank.org

- Development of DSF supported by Royal HaskoningDHV