

Research for PECH Committee – Workshop on electronic technologies for fisheries - Part III: Systems adapted for small-scale vessels

KEY FINDINGS

- **Electronic Monitoring (EM)** systems using **closed-circuit television (CCTV) cameras** and various sensors can also be used on vessels below **12 m**.
- **EM sensor systems** can record detailed information on **all length classes** fishing vessels.
- The **use of tablets and smartphones** as a tool for recording fishing operations and as logbook and report tool can **prevent data deficiencies**.
- The **use of EM** can improve possibilities for **monitoring compliance** with *e.g.*, the landing obligation (LO).
- **Electronic technologies (ET)** are cost-effective to **monitor compliance** in small-scale fisheries (SSF).

Background



The **small-scale vessel fisheries** are playing an **important** socio-economic and cultural **role** in European waters and coastal communities, but in terms of **monitoring and control** they have generally been **neglected** in Europe by fisheries scientists and fisheries managers at national and European Union (EU) level. In general, the SSF fleet segment can be characterized as a fisheries fleet segment providing **insufficient information** on its fishing activities for **sustainable management** of the EU fisheries and the marine ecosystem.

The present document is the executive summary of the study for Workshop on electronic technologies for fisheries - Part III: Systems adapted for small-scale vessels. The full study, which is available in English can be downloaded at: <https://bit.ly/3lRfoYA>

In the EU fisheries, only vessels above the length of **10 m** are obliged to fill in a **logbook** and only vessels above the length of **12 m** are obliged to use **VMS** (Vessel Monitoring System). Furthermore, for both obligations there are possibilities for **exemptions**.

Usages of electronic technologies for fisheries control and monitoring

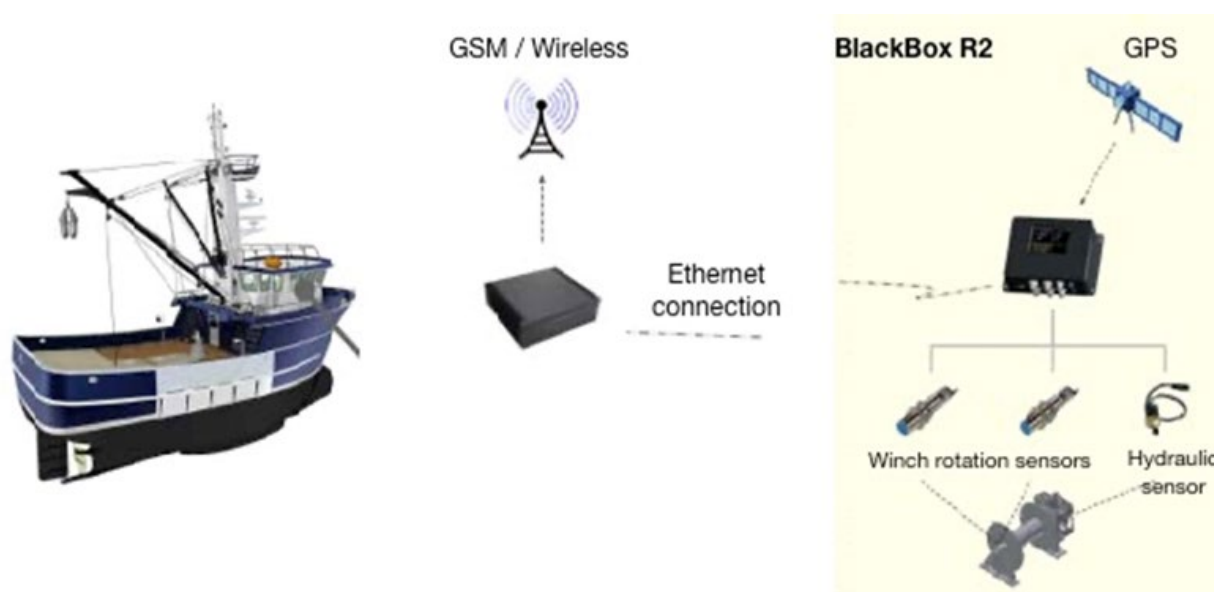
Worldwide, **ET** are increasingly being deployed to improve fisheries **monitoring** in **all types of fisheries**. The use of camera-based Electronic Monitoring (EM) systems including CCTV (closed-circuit television) cameras, gear sensors and advanced data analysis can provide **full documentation** and accountability for **fishing activities**. The use of EM and other electronic devices generates several benefits, such as **high levels of compliance** and documentation of **fishing practices**. For the SSF fleet, the **use of tablets and cell phones** for electronic reporting and monitoring has **developed significantly** over the latest years in many parts of the world.

Fixed **video-based EM systems** installed on fishing vessels offer a cost effective and 24/7 monitoring **alternative to independent fisheries observers** to collect data in SSF. Video-based high-resolution data makes it possible to **estimate accurately e.g., compliance** with the LO, discard activities and incidental bycatch of protected, endangered or threatened (PET) species.

Observer coverage in the SSF is traditionally **low**, and there is often a **lack of information** on the spatiotemporal distribution and intensity of fishing effort. Implementation of video-based EM systems in the SSF can become an important tool to assess the **impact of SSF on marine ecosystems** in the EU.

Non-camera **EM sensor systems** provide high-resolution fishing data by **recording vessels' fishing activities**, which result in better control and surveillance of the fisheries. The implementation of EM sensor systems on **bivalve fishing vessels in Denmark** has **increased accuracy and transparency** of fishing activities. Combining the **EM sensor data** with **logbook information** provides the possibility of **fine-scale mapping** and assessment of actual area impacted by each individual fishing activity with a **very high** temporal (10 sec.) and spatial (below 10 m) **resolution**.

Figure 1: Non-camera EM sensor systems - Schematic overview of the BlackBox R2 system mounted on all Danish bivalve fishing vessels



Source: Danish Fishery Agency

EM systems have, within the **EU**, **mainly** been installed on **larger vessels**. However, **EM systems for SSF** have been developed and are implemented for large scale use in **Latin America** with more than **600 vessels** being **monitored in 2021**. The systems are fitted specifically for the small vessels in terms of power use, mounting and data upload.

Most Europeans own a smartphone or a tablet nowadays, and these **portable devices** offer an ideal platform to **develop monitoring solutions** for SSF vessels for which space and power onboard are often limited. The ease of use and versatility of **apps can speed up and facilitate tasks** like reporting the fishing activity to the authorities. Replacing **logbooks** and **landing declarations** using **data recorded semi-automatically** on a smartphone/tablet can be a **strong incentive** for fishers.

When available, **apps can enhance fishing procedures**, without the need of dedicated computer software to run on the vessel. This is of **particular interest** on small-scale **artisanal fishing vessels**, which cannot accommodate such equipment onboard for a lack of space or power, or simply because it would be too expensive. A major **advantage of apps** compared to, *e.g.*, fixed or mobile EM systems is that they can be used on literally **any vessel**, regardless of size, provided the fisher carries a smartphone or tablet. The **costs of implementing** such systems on a large number of vessels, be it for management, scientific monitoring or control purposes, is therefore **below the one of all the other ET solutions** presented in this report, without necessarily losing much in resolution and accuracy. For **very small vessels** operating in European waters, the **generalisation of apps** combining fishing activity monitoring, logbook and landings declarations could conveniently **replace pen and paper** in the future, thereby enhancing considerably the **quality of fishery-dependent data**.

Policy recommendations

Monitoring and control, SSF have generally been relatively **neglected in Europe** by fisheries managers and fisheries scientists both at national and EU level. In European waters, SSF often provide **insufficient information** with regards to fishing activities for ensuring a sustainable management of this fleet segment and of the marine ecosystem. Based on the present review, we have come up with a short list of global **policy recommendations**:

- For **monitoring** compliance with the LO, fishing vessels in SSF could be equipped with **video-based EM systems**, as those described in **case studies I and III**. It is recommended that video-based EM systems are installed on all the vessels using **mobile gears**, as this is the **fleet segment** with the **highest risk** of non-compliance with the LO. To limit the workload for EM analysts and reduce the cost, it is advised that **national competent fisheries authorities** analyse a subset of the entire EM data that are collected. For instance, only a **random selection** of 10 % of the entire **fishing activity** could be reviewed for any **discard** of species with a **total allowable catch** (TAC) as portrayed in **case study I**.
- In fisheries with **low discard or bycatch risk**, such as **dredge fisheries** for bivalves or low impact fisheries using *e.g.*, **pots** or **handlines**, video-based EM is likely unnecessary, but it is recommended to **monitor the spatiotemporal** distribution at a fine-scale for control but also for **documentation** of important **fishing grounds**, using for instance an **EM sensor systems** – or a similar technology – as is described in **case study II**.
- In fisheries where there is a suspicion of **high-risk of incidental captures** of **PET species**, including marine mammals, birds, chelonians, as well as **non-commercial fish** and elasmobranchs, it is recommended that at least a **representative sample** of the fishing

vessels in the fleet carry a **video-based EM system**, such as the ones described in **case study I** or, *e.g.*, for small open boats, the technology described in **case study III**.

- The current requirements for **documenting fishing activities** in EU fisheries using traditional **paper logbooks** for vessels below 12 m (10 m in the Baltic Sea) have been **outdated** for several years. It is recommended to gradually generalise the utilisation of **tablet or cell phone apps** specifically designed to fulfil the **EU reporting requirements**. These apps, such as some of the apps listed in **case study IV**, should be available in the fishers' **native language**.
- Finally, it is recommended that, for **all length classes**, individual vessels' **identity** and fishing **activity** are accessible at the **finer possible spatiotemporal scale** to the competent authorities and to the national scientific bodies responsible for the scientific advice.
- **Data** alone will not result in more sustainable fisheries, and data themselves will not lead to better decision-making, but they are a key component of an **effective ecosystem-based management** in EU waters. It is of course a **challenge for fishers** and especially for small-scale vessel fishers to adopt and afford new technologies for monitoring and reporting fishery-dependent data. Therefore, **financial support** will be necessary when implementing electronic technologies in the SFF, for instance through the **European Maritime Fisheries and Aquaculture Fund (EMFAF)**.

Further information

This executive summary is available in the following languages: English, French, German, Italian and Spanish. The study, which is available in English, and the summaries can be downloaded at: <https://bit.ly/3IRfoyA>

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