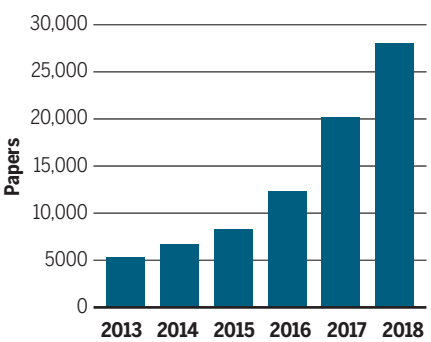
metrics expert at the Georgia Institute of Technology in Atlanta. The extra push was welcome, says Danang Birowosuto, an Indonesian physicist at CINTRA, an international research group in Singapore: "Our international competence in science is still very low."

But many Indonesian academics worried that SINTA might harm their reputations. Thousands joined groups on social media to help each other navigate the new numbers-driven landscape. "Although the original aim was sincere," discussions soon turned to gaming the system, says plant biologist Andik Wijayanto of the State University of Malang.

In October 2018, Anis Fuad, a health informatician at Gadjah Mada University in Yogyakarta, presented RISTEK with a detailed analysis of the problems. Indonesia's most-cited 2018 paper so far wasn't a major breakthrough, Fuad noted, but a study titled "Analysis of Student Satisfaction Toward Quality of Service Facility," presented at a workshop co-organized by the Indonesian Publications Collaboration Community (KO2PI) and published in conference proceedings, a type of publication that gets minimal peer review. The study had been cited 42 times, often in papers on unrelated topics—including mosque architecture and cold storage of fish—that were also published in conference series or in low-quality open-access journals no longer indexed in Scopus.

Surging ahead

New incentives have driven a sharp rise in Scopus-indexed papers from Indonesia.



One of the paper's 10 authors was statistician Ansari Saleh Ahmar of the State University of Makassar, who won SINTA awards in two categories last July; he co-authored more than 100 papers in 2017 and 2018 and has been cited almost 600 times. Ahmar is also president of KO2PI, which has run workshops in an extraordinary range of scientific fields. On a poster produced in early 2017, KO2PI promised participants a paper in a Scopus-indexed proceeding in return for a 1.5 million rupiah ($106) fee. Ahmar says he was "surprised" by his own citation rate, but says statistical papers are often cited in seemingly unrelated fields. He says he is no longer active in KO2PI and, given the controversy, would now like to return his award.

After asking Ahmar and other academics suspected of gaming the system for an explanation, RISTEK has deleted their SINTA accounts, Sadjuga says, but it has not withdrawn the awards because "the public shaming is punishment enough." Sadjuga says problematic data in Scopus and scientists' unethical behavior contributed to the problem but does not blame SINTA itself. (An Elsevier spokesperson says Scopus has stopped indexing three journals that many Indonesian scientists have published in and is investigating "concerns" about the conference series used by KO2PI, which is published by the U.K. Institute of Physics.)

Gaming aside, Indonesia's research evaluation should not rely on a commercial database, says Dasapta Erwin Irawan, a hydrogeologist at Bandung Institute of Technology. He also says the system's preference for Scopus-indexed international journals is misguided, because research in Indonesian journals may be just as good and sometimes more relevant. RISTEK doesn't entirely ignore local journals: It has created an online portal, named Garuda, to more than 7000 journals in the Indonesian language, as well as a journal accreditation system. But researchers win far fewer SINTA points when papers in local journals are cited and none at all for publishing in them.

That lack of appreciation for locally relevant research violates the "Leiden Manifesto for research Metrics," an influential paper Hicks and three co-authors published in 2015. Hicks says SINTA falls short on several other principles in the manifesto, which stipulates that metrics should "support a qualitative, expert assessment" and "account for variation by field in publication and citation practices." SINTA currently does neither.

A new version of SINTA, set to be launched this year, will integrate data from several additional sources, including the Web of Science and the Indonesian National Library. It will also give researchers credit for other types of output, such as books, artwork, and patents. A new tool will flag self-citation and the ministry will disseminate scientific integrity guidelines to Indonesian universities.

But Mikrajuddin Abdullah, a physicist at Bandung Institute of Technology, says RISTEK should still review last year's awards and retract them if they were based on misconduct: "It will teach us that scientific achievement does not come suddenly, but is the result of a long period of perseverance." ■

Dyna Rochmyaningsih is a journalist based in Deli Serdang, Indonesia.

FISHERIES SCIENCE

Ships banned from throwing unwanted fish overboard

Controversial European policy worries industry while environmentalists fear rampant cheating

By **Erik Stokstad**

Long before fillets reach your dinner plate, lots of seafood is thrown away. Overboard, actually. As fishing crews sort through their catches, they toss unwanted fish back into the sea—as much as 20% of the global catch. The vast majority die. On 1 January, the wasteful practice became illegal in waters of the European Union. Scientists believe the policy will lead to more efficient fisheries and eventually boost stocks, while incentivizing more selective fishing gear and strategies. But in the short term it could mean hardship for the industry and perhaps even compromise fisheries data, if hidden cheating becomes widespread. "This is one of the most dramatic changes in EU fisheries policy," says Peder Andersen, an economist at the University of Copenhagen.

Regulators began to phase in the discard ban, formally known as the Landing Obligation, in 2015. To ease the pain, they started with vessels that didn't discard much because they catch schools of herring and other single species. Now comes the bigger challenge: fisheries where many species live together, such as those in the North Sea. When vessels drag nets near or along the bottom, they end up with a jumble of species and sizes. Until now, vessels only kept the valuable portion of their catch. The discarding of young fish, which haven't yet reproduced much, has hit struggling populations especially hard.

Under the ban, fishing vessels must bring back all regulated species, a significant headache. More time will be spent sorting fish, as even the unwanted ones must be tallied and brought to port. Holds will fill up faster, meaning more trips to sea and higher fuel costs. And unwanted fish will be sold for a fraction of the price of the normal catch, if it can be sold at all.

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A new European policy bans the discarding of regulated fish, such as this cod.

PHOTO: JAMES BOARDMAN/ALAMY STOCK PHOTO

A second problem for industry is that the ban creates the prospect of "choke species" that threaten to shut down fishing. In a fishery with a mix of species, a vessel might catch the same proportion of species each time it trawls, despite varying quotas for the allowed catch of each. Before the discard ban, this wasn't a problem: Fishers could keep catching haddock and whiting, for example, even after reaching their cod quota. Following the law, they simply threw away any new cod caught.

Now, vessels in some places will have to stop fishing once they reach their quota for choke species like cod. Haddock or whiting quotas will go unused—a lost economic opportunity. "Choke species are a huge problem," says Daniel Voces de Onaindi, managing director of Europêche, a lobbying group in Brussels. "We're talking about destroying boats, and unemployment." The discard ban does exempt species, such as Norway lobster, that typically survive after they are returned to the water. And last month, EU fisheries ministers boosted quotas for five species, despite scientific advice to protect these stocks.

Still, case studies from DiscardLess, an EU-funded research project that wraps up this month, suggest the fishing industry could suffer losses on the order of 10% for several years if the ban is enforced.

Over the longer term, the discard ban will boost fish stocks and benefit the overall ecosystem, according to modeling led by Marie Savina-Rolland of the French Research Institute for the Exploitation of the Sea, an oceanographic research center in Lorient. That could eventually translate to higher quotas and profits, says Andersen, who co-led economic research for the DiscardLess project.

The ban could also stimulate more research on new fishing gear and tactics to avoid unwanted catches. Researchers have already shown benefits from separator trawls, which have a horizontal panel at the opening. Haddock and whiting tend to swim upward when the trawl approaches. The panel diverts them into an upper net, whereas cod and monkfish are collected by a lower net. Unwanted species can escape through an opening in the net. Equipping fishing gear with light-emitting diodes can also help reduce bycatch, DiscardLess researchers have found, by discouraging some unwanted species from entering trawl nets. But these techniques also lose some of the commercial catch, so industry has not adopted them widely. "It's rare to get a situation where you can avoid unwanted sizes or species and not pay a penalty with the fish you do want," says David Reid, a fisheries ecologist at the Marine Institute in Oranmore, Ireland.

> ***"It could bring about a very big, negative change. I get very worried about European fisheries management."***
> **Lisa Borges**, FishFix

More quota trading could also help industry cope. If a vessel or fleet has run out of quota to catch cod in its mixed trawls, for example, it could offer its quota of whiting to a fleet with the opposite problem. Last month, EU fisheries ministers increased pressure on nations to start trading quotas. "It's basically banging their heads together and saying you must swap quotas for this to work," says Andrew Clayton, who directs the Pew Charitable Trusts's campaign to end overfishing in northwest Europe and is based in London.

Few expect all fishing vessels to obey the discard ban. "Put yourself in the boots of a fishermen who can see he will run out of quota for a species. If he does, he would have to tie up for the rest of the year. He might have to sell the boat, or sell the house," says Barrie Deas, CEO of the National Federation of Fishermen's Organisations in York, U.K. "What's he going to do?"

Scofflaws could jeopardize not just fish stocks, but also data about how they are faring. Researchers, who suggest catch levels to regulators, get their discard data largely from independent observers on just a few boats—less than 1% of the EU fleet. Observed boats are now likely to discard much fewer fish than other vessels, leaving an official undercount of the discard rate and a falsely rosy picture of how heavily stocks are fished, says Lisa Borges, a fisheries biologist who runs a consultancy called FishFix in Lisbon. "It could bring about a very big, negative change," Borges says. "I get very worried about European fisheries management."

Environmentalists want to toughen up enforcement by installing cameras on ships, the practice in New Zealand and a few other places with discard bans. But Voces de Onaindi says this is impractical on some vessels and raises privacy concerns. Countries where discard bans have succeeded, including Norway and Iceland, have gradually introduced incentives and controls to develop the economic use of unwanted fish and create a culture of regulatory compliance. Those steps, Andersen says, lessen conflict but can take decades to achieve. ■

Ships banned from throwing unwanted fish overboard

Erik Stokstad

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