

Besieged from all sides: impediments to science journalism in a developing country and their global implications

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Abstract

Despite high expectations of their normative roles in development processes, Vietnamese science journalists interviewed for this research essay find it extremely hard to enact such roles, facing an uphill battle to establish science as a legitimate news beat. This results from a diverse set of internal impediments (particularly a science-unfriendly news culture and low ethical standards) and external obstacles, including political control and low cooperation of local scientists. Placing these findings in the wider context, we demonstrate that Vietnam illuminates many troublesome characteristics of science journalism in the Global South and make some recommendations for improving the status quo.

Keywords

Professionalism, professional development and training in science communication; Science and media; Science communication in the developing world

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Introduction

Science journalism plays a critically important, albeit not always duly recognised and sometimes depreciated, role in the development of human societies. In an ideal sense, by monitoring, verifying, contextualising, analysing and critically reporting on scientific advances and issues, sound science journalism is instrumental in bringing scientific ideas and outcomes into daily life and enhancing the laity's ability to understand and engage with science's benefits, risks, trajectories and implications for human causes and processes [Angler, 2017; Nelkin, 1995; Secko, Amend & Friday, 2013]. In the Global South, science journalism plays an even more crucial role as their people have rather limited access to non-news science communication channels and facilities that are often taken for granted in the Global North (such as science events/festivals, science education websites or science museums) [Appiah, Gastel, Burdine & Russell, 2012; Dutt & Garg, 2000]. Despite this vital importance, however, the practice of science journalism in the Global South remains a heavily under-researched area in the science

communication literature [Schäfer, 2012]. A recent systematic review found that research into science journalism in the South accounts for a mere 74 out of thousands of publications in the ten highest-ranked journalism and communication journals between 2000 and 2017 [Nguyen & Tran, 2019]. Further, this minimal body of research tends to focus on the more advanced group of developing countries (e.g. China, India, Brazil and South Africa) and ignores those of lower tiers, such as Africa and developing parts of Asia. It is also based primarily on manifest science news content analysis rather than systematic insights into its production practices and processes and/or its producers' perceptions of professional challenges and opportunities.

To address these gaps, this research essay explores the current state of science journalism in Vietnam as a case in point. Vietnam offers an interesting case study here. As a one-party state under the rule of the Communist Party of Vietnam, its media system is designated as first and foremost as a propaganda system. Since the country's reform — *doi moi* — in 1986, however, it has evolved into a relatively more open space to accommodate the needs and demands of the plural market economy and its associated democratisation process. In the fresh air of *doi moi*, especially since the collapse of the Soviet Union and other communist regimes, Vietnamese media have been shifting from pure propaganda functions to the multifunctional role of informers, educators and entertainers. The end of state subsidies for the media has led them to the market logic, competing with each other for advertising revenues and copy sales while trying to maintain the party's line [Hang, 2004]. These, together with rapid globalisation and digitalisation processes, have led the state to adopting a somewhat more flexible and, to some extent, more tolerant media control approach, including giving some (limited) space for journalists to act as monitors and investigators of socio-political problems [Nguyen, 2009]. The singular Soviet-modelled system has been replaced with a multi-structured system of state-owned but market-oriented media operations, although the shadow of communist ideologies still casts on everyday practices. While this is somewhat peculiar, the dual role of the media as political institutions under government control at the same time as business institutions in the competitive market is not uncommon in developing countries. In that context, and in light of the similarities in science and technology systems between these countries [Nguyen & Tran, 2019], we expected that science journalism in Vietnam would reflect the general issues and characteristics of this news beat in the Global South. Based on in-depth interviews with 40 Vietnamese science reporters and editors over an eight-year period between 2012 and 2020, we found that to be the case. In the analysis that follows, we will demonstrate that, while some of challenges to science journalism identified in this study are Vietnam-specific, most reflect issues seen here and there in other developing countries. With that and other observations in mind, we will make some positive notes from a capacity building programme by the World Federation of Science Journalists, to demonstrate how such international training and coordination can make a practical difference to the professionalism level of science journalism in the Global South, for the sake of global development.

The data for this study

This essay is based on three rounds of in-depth interviews with Vietnamese science journalists over an eight-year period. It started with the second author's role as the monitoring and evaluation researcher of SjCOOP Asia, a training and mentoring programme of the World Federation of Science Journalists in Southeast Asia during

2012–2013. During this time, he interviewed more than 40 science journalists from six countries, including 12 from Vietnam, around the current status of science journalism in their countries and how this training programme could help to improve it. This research resulted in several internal, unpublished reports to the WFSJ [Nguyen, 2014].

The initial insights in these reports were then taken further into a Ph.D. project on science journalism for development in Vietnam by the first author during 2017–2021, under the principal supervision of the second author. During this Ph.D. study, we conducted two further rounds of in-depth interviews. The second round consists of in-person interviews with 24 science reporters and editors during 2017–2018, including six of those who had been interviewed as part of the SjCOOP Asia project in the first round, about how to perceive and perform their role as science reporters and what challenges lie in the path from their role perception to their role enactment. The third included phone interviews in July 2020 with eight reporters and editors who were responsible for covering the Covid-19 pandemic. The aim was to explore, *inter alia*, how the general challenges to Vietnamese science journalism were manifesting in the way Vietnam's news media responded to the unprecedented rise and the sheer scale of its medical, social, economic and political impacts.

Across three rounds, a total of 40 science journalists were interviewed, with six interviewed twice. By “science journalists”, we do not mean that the interviewees were formally designated as science reporters or science editors in their newsrooms, as there are very few specialist jobs of this type in Vietnamese media. Rather, the interviewees were chosen because they had reported or were reporting on science and science-based topics at the time of fieldwork. Only one of the interviewees was a specialist health reporter and the rest had a portfolio combining science and non-science topics such as education, agriculture, economics and so on. In demographic terms, 28 interviewees (70%) were working in print, six in broadcast (15%), three in online-only media (7.5%), and three in hybrid print and online media (7.5%). There were less women than men in the sample (42.5% and 57.5% respectively), and the vast majority were in the 25–40 range, with only three over 40, at the time of the interviews. In the analysis below, we will name participants according to their newsroom roles and SjCOOP training background: those with an A initial were science editors; those with B were science reporters not trained in SjCOOP, and those with C were reporters trained in SjCOOP (some were interviewed twice).

In all three rounds, a detailed interview guideline was prepared and pilot-tested before the fieldwork. In general, we adopted approaches from previous studies [e.g. Guenther & Ruhrmann, 2013] to divide each interview into three major themes corresponding to three levels of influences on journalism practice (Figure 1). At the individual level, we explored perception, interest, knowledge and skills in selecting, assessing and presenting science in the news. In particular, the interviewees were probed for normative expectations of the professional roles and functions of science journalism, the ethical principles that they uphold in science reporting, their relationship with sources, and the common strategies they employ to overcome difficulties in covering science news. They were also encouraged to reflect on specific cases and examples to identify how science should or should not be reported in the local media. At the organisational level, we explored the impacts

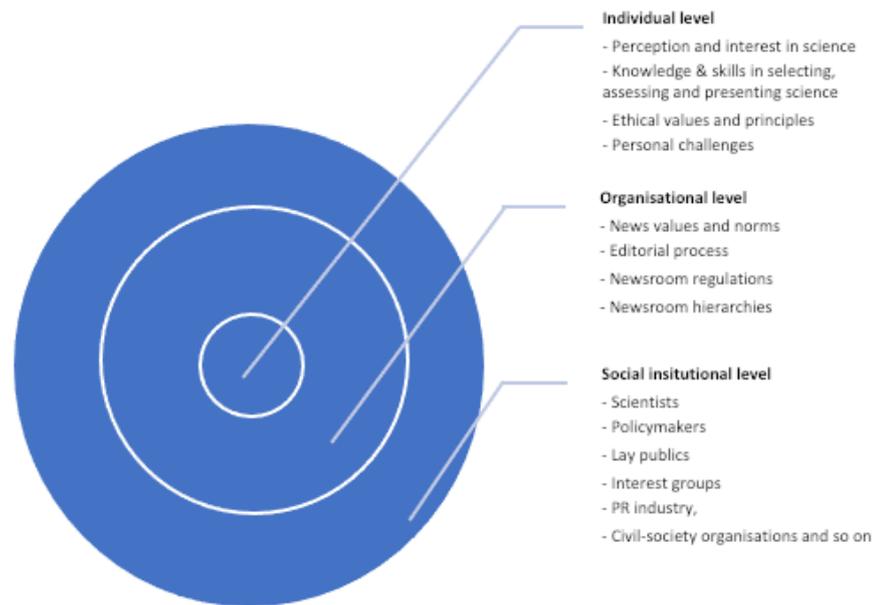


Figure 1. Potential influencers on science journalists' professional practices (adopted from Guenther and Ruhrmann [2013]).

of communication routines — such as news values and norms, editorial process, newsroom regulations and hierarchies — to obtain an in-depth understanding of science news selection and exclusion processes in Vietnamese newsrooms. At the social-system level, we asked participants about how they work with other stakeholders — such as scientists, policymakers, lay publics, interest groups, PR industry, civil-society organisations and so on — in producing science news. In particular, the cultural, political and social contexts in which participants were operating were probed as potential facilitators for or challenges to professionalism in science journalism. For the third round, we used the same set of questions but added several sub-questions to explore specifically how general science journalism practices, issues and challenges manifested themselves in the reporting of Covid-19.

It must be noted that not all our interviewees were able to articulate all these issues in fine detail. This is in part because many, especially those who had not been through any specialist training like SjCOOP, did not have a clear or adequate concept of what science journalism is. In fact, in the early stages of their interviews, two participants even categorised academic publishing as a form of science journalism (a recognition that, sadly, does exist in the country's media laws). As such, in order to gain rich and nuanced data, all interviews were conducted in a way that allowed a great deal of flexibility to suit different participants' experience and knowledge levels. Neutral, non-direct, open-ended questions were used to encourage participants to speak freely and openly about their attitudes, beliefs and values rather than give binary yes/no responses. Interviewees were constantly encouraged to cite specific cases and examples to support their points of view. These were fact-checked in the background and, where necessary, were triangulated in follow-up conversations with relevant interviewees.

The interviews were thematically analysed on Nvivo. Given the limited literature into the issues at stake, we decided to conduct an inductive analysis of the data as they evolved throughout the process. The inductive technique offers a simple but

systematic way to establish the structure of issues and processes that are inherent and evident in the raw data. As a “bottom-up” data analytic strategy, it allows coders to read through data and openly choose frequent and dominant themes as they emerge [Thomas, 2006]. At the centre of this is a constant comparison process in which the core themes and sub-themes — as well as relationship patterns among them — were identified after each round of interviews and then further validated in the next, until there was sufficient evidence for each theme/sub-theme. Altogether, by the end of the third round of interviews, we had reached a theoretical saturation point where the various issues raised by interviewees became repetitive and provided few new insights. Hence, the findings presented in this work will form a valid, trustworthy account of the state of journalism about science in Vietnam. In the analysis that follows, we will place the key issues and patterns from our Vietnamese data in the broader context — to identify some common and salient issues about science journalism in the Global South of which Vietnam might serve as a microcosm.

High normative expectations

Despite its officially defined status as a strategic contributor to national development [Truong, 2019], science, technology and innovation in Vietnam remains a weak area in need of much more rigorous attention and investment. The business sector still plays a minor role in R&D funding and performance whereas academic science research and innovation is far from meeting the country’s development needs and demands [OECD & The World Bank, 2014]. In that context, our interviewees show a strong, sometimes quite surprising, pattern of normative perceptions about science journalism. For most, the relatively backward state of science in Vietnam is a deeply concerning issue but, at the same time, represents an immense opportunity for journalism to take an instrumental role in its nation-building processes. The overarching mission of science journalism that was shared in one way or another by the interviewees is to act as an agent of change for developmental causes. In particular, they wanted science journalism to generate the social and political will to push science to a central position that it deserves but, for them, have not achieved in national development processes and policies. In making such arguments, they pointed to a rich range of socio-economic areas that need the assistance of sound science journalism — such as energy production, agricultural productivity, food safety, health crisis, disaster prevention, poverty alleviation, waste management, pollution control, biodiversity, climate change mitigation and adaptation, globalised knowledge economy and so on. As one elaborated:

Science and technology still accounts for a tiny proportion of the national budget.¹ Through connecting citizens, businesses and governments with science through news, information and debates, science journalists should aim to increase it.

In microcosm, our participants dissected this overall change-agent mission into three inter-related functions. First, being keenly conscious that Vietnam is primarily a recipient rather than producer of most science knowledge and technological innovation from other parts of the world, the interviewees saw an

¹Science and technology makes up 1.4%–1.85% of the national budget, equivalent to just 0.4%–0.6% of the GDP [Hà, 2018].

imperative for journalism to play a key role in what we would call *science gatekeeping*. They tasked themselves to take a lead, alongside science institutions, in helping people and organisations to properly adopt and implement science from outside. Many emphasized the importance of journalism in equipping the public and policymakers with essential informational tools to deal with vital but controversial science areas such as nuclear power, genetically modified crops, nanotechnologies, stem-cell therapies, artificial intelligence, and so on.

Second, in relation to that, there was a strong emphasis on the function of science journalism as *science popularisation*. On one hand, the interviewed journalists aspired to be a key force in building and enhancing public science literacy, which they unanimously saw as a key factor in national development. This was raised with frequent references to keeping people interested in, informed of and engaged with scientific advances that bear direct relevance to daily life and/or have “wide impact on human beings” (e.g. genetically modified organisms, artificial intelligence, medical treatments such as stem cell therapies, or disease controls such as vaccination). On the other hand, they wanted to use their journalism to attract young people to science. “Science journalism has to encourage audiences, particularly young people, to be interested in science”, said one interviewee [A2]. “Journalists should write about science in ways that enthuse and stimulate the imagination of young people about science and technology as they are the future drivers of Vietnam’s development”, said another. “Ideally, we should make them feel that science is a fun, worthwhile and rewarding career”.

Third, a smaller but significant number of the interviewed journalists attached their job to the duty to monitor the conduct of science and scientists. These journalists were keenly aware that science has its own goods and ills, with all possible sorts of outcomes, and that scientists are just human beings who can make mistakes, who have their own personal ambitions and career trajectories, and who bear normal daily-life concerns like any other. This would mean for them that science journalism must be critical enough to help laypeople to not place an unconditional faith in scientific endeavours. Some, albeit not a majority, went further, calling for science journalism to empower people to monitor and debate the nation’s science policies and its development-related trajectories. “The broader mission of science journalism is to inspire and prepare the public to voice their opinions in science issues and policy making”, said A4, an editor.

Despite such high normative expectations and aspirations to put science journalism at the heart of development, our interviewees faced an almost opposite reality. In almost every interview across the eight years of this research, there was a clear sense of disillusion amongst many interviewed journalists, most notably a real frustration that many things science journalism must do are not done in reality due to an array of internal and external challenges. Some of these are peculiar to Vietnam and others are in common with other developing countries.

Science journalism in Vietnam: a faint existence

Our data show a very similar picture in Vietnam. Despite their aspiration to push science journalism to a central position in national development processes and policies, the interviewees recognised that genuine science journalism is still a rarity in their country. Speaking in 2018, one science editor observed that the number of reporters with some specialist expertise in science reporting in Ho Chi Minh City

— Vietnam’s media hub — had remained unchanged at “around ten in the last decade” [A3]. The six SjCOOP-trained reporters, probably thanks to their generally higher normative expectation of science journalism, were the most frustrated with its current status. Participant C3, for example, contended that science journalism remains “a strange concept” in Vietnam. “Few would have the opportunity to participate in international training projects such as SjCOOP to obtain a proper idea of what science journalism is about and why it is important”, he said. “Most — I would say, about 80 or 90 per cent of those who write about science and technology — don’t have a clue of what science journalism is supposed to be”. C6 agreed:

Vietnam doesn’t have science journalism yet. There is an association of science journalists but they mainly duplicate news announcements from the Ministry of Science and Technology. They call what they do science journalism, but it’s not what I would define as such.

Sometimes, the lack of a clear definition of what constitutes science news leads to bizarre treatments. A6, for example, said that his newspaper once categorised a story about a personal attack to a medical doctor as a science story.

Along with that is the lack of dedicated print space and airtime for genuine science topics, according to interviewees. One common approach by Vietnamese news outlets is to have a combined Science and Education section, where education stories, being closer to readers’ daily concerns, often dominate. Some others merge science and health topics into one section, but the focus is mainly on daily health issues and concerns, such as body processes, nutritional effectiveness, new medicine, food safety, healthy lifestyles, risks of cancers and other fatal diseases and so on. In fact, because Vietnam has one of the world’s highest cancer fatality rates [World Cancer Research Fund, 2020], some interviewees referred to cancer-related topics as a way to increase audiences for science news. Of the few outlets that do opt for dedicated Science and Technology sections, the focus, again, is primarily on the so-called “news you can use” — e.g. consumer information and advice about electronic appliances, digital gadgets, hardware configuration, software and so on — rather than science progresses, issues and policies. Meanwhile, the best general-interest magazines of the 1990s and 2000s — *Today’s Knowledge*, *New World* or *Young Intellectuals* — have closed down due to the loss of audiences and revenues to the digital world.²

It is, however, not only the minimal quantity of science journalism but also its low quality that concerned our interviewed journalists. Against their wish for science journalists to serve as critical observers of and to help laypeople to engage with science’s processes, outcomes and implications, our interviewees acknowledged, the reality is far from that. The lack of depth and substance was raised more often, with a higher intensity of frustration, than any other aspect of Vietnamese science journalism. Very often, they said, science stories take the superficial form of short and straight news about concrete one-off events rather than thematic and/or detailed analysis of the science issues of the day. Even when they report on one-off events, Vietnamese science journalists tend to easily accept given narratives, rarely

²This paper’s second author, who led the science section of *New World* in the late 1990s, has also witnessed the magazine descending fast into its final issue in 2015.

offering reflection and discussion on research methodology, evidence validity, strengths and limitations, ethics and other issues beneath the surface. One editor commented that science news in Vietnam does not often go beyond the level of “basic announcements” from sources, “with little explanation or scrutiny”.

These issues, as the participants in our third round of interviews argued, were laid bare in Vietnamese news coverage of Covid-19. Although the pandemic was not just a science story, it was vital for media reporting to ground on science, because science provided the basis for public health measures and informed public compliance. However, reporters from Danang city — the hotspot of Vietnam’s second Covid-19 wave — revealed that they were assigned to cover the pandemic without adequate knowledge, skills and source contacts for science and health reporting. As such, they observed, the news was dominated by descriptive stories on the fluctuation of infected cases, numbers of deaths or recovered patients, and the more visible socio-economic consequences of the pandemic. News analyses of the scientific complexities and uncertainties around Coronavirus and how they should shape the way societies should respond to the pandemic were lacking both in quantity and quality. Among those that were not scrutinised very well, according to participants, were the true values of Vietnam’s testing and tracing system, the efficacy of masks, the unproven effectiveness of the anti-malaria drug hydroxychloroquine in Covid-19 treatment, the safety of Russian and Chinese vaccines, the transparency of the Vietnamese Nanocovax vaccine’s clinical trials, and the government’s inconsistent and over-reactionary social distancing and lock-down policies. According to B8, such shortfall was rather unfortunate at a time when people, trapped in an abundance of mis/disinformation on social media, desperately needed guidance from authentic information sources.

A more general outgrowth of the lack of an evaluative and analytical dimension is what an interviewee called “the dizzy frequency of inflated science reporting” — i.e. reporting that does not strike the right balance between scientific rigour and emotional responses, especially when it comes to the benefits and risks of new science. For instance, new discoveries and innovations are all too often framed on and excessively celebrated for their novel benefits, without due recognition of their potential limitations or risks. And when risks are reported, they are usually exaggerated to attract attention. According to interviewees, there is too much inaccurate, confusing and/or sensationalised reporting about science-related risks, especially environment and health risks. A9, a veteran health editor, commented that “health news in Vietnam, instead of helping people live a better, more healthy life, is like a smokescreen that creates confusion, panics and chaos”. As he lamented:

Here, if you follow the news, you are likely to find that you might die of cancer some day because of the daily food you happen to eat. And the usual way for many to move on is just to ignore these scare stories and keep going with their eating habits. People are paralysed. [A9]

Vietnam has seen occasions in which local economy is severely afflicted due to false risk claims in the news. One example is a recent media frenzy around the threat of benzoic acid to human health. In April 2019, Japanese authorities in Osaka recalled over 18,000 bottles of Chinsu chili sauce imported from Vietnam for containing

benzoic acid over the level allowed by Japanese authorities. Although several newspapers took care to point out that the amount of benzoic acid in Chinsu sauce was deemed high by Japanese criteria but were accepted by Vietnam authorities, as well as international food safety regulators such as the US FDA and CODEX, they were more the exception than the norm. The possibility of benzoic acid causing cancer was exaggerated in the news, frightening many consumers who were not well equipped to engage in critical science news consumption. The fish sauce incident below will offer a more dramatic example.

A science-unfriendly news culture

In anatomising the causes of the poor state of science news in Vietnam, our participants pointed to a number of challenges within the news media: little newsroom investment in science journalism and poor work condition.

Participants complained endlessly about the half-hearted, lip-service support for science reporting by newsroom leadership. Editors, they said, lack the knowledge and attitudes to see the normative and business values of science news or, in the words of participant C3, “even to appreciate what we are doing”. This manifests not only in the aforementioned lack of dedicated space for science topics but also the treatment as “second-class” content in daily newswork. As one observed:

Science stories are rarely mentioned or discussed in daily editorial briefings. Few editors realize that almost every aspect of our daily life is related in some ways to science and technology.

Further, our interviewees complained about heavy workloads as they were increasingly asked to cover too many topics on too many platforms. The pressure is not only to produce more content but also to do it faster under an intense competition. “Journalists run for breaking news and overlook fact-checking”, said one participant. “They are facing increasing competition pressures both from other staff within their newsroom and from other outlets”. In such situation, ironically, those who are trained to do analytical and in-depth science journalism are amongst the disadvantaged. C5 reported being deemed as “less productive” by his editors since SjCOOP training because “I now always ask for more time for factual verification and in-depth exploration”. Similarly, C3 found it too hard to match other colleagues’ efficiency. “Whenever I attend an event, it takes me days to dig out the facts beneath the surface whereas others just snatch or massage the press release into a news article”, he said.

In parallel with that is the prospect of poor pay under the increasingly common audience metrics-based reward system. Vietnamese journalists are traditionally paid on a story basis (on top of a basic salary) and, the intrusion of analytics into this pay system leads to a financial incentive to “do less for more” — i.e. shorter, less complicated stories for more readers (and, thus, more money). “No matter how useful or useless your story is, pageviews play the most crucial role in a reporter’s performance evaluation and reward”, said C5. As science is not among the best-selling topics, science writers often receive less pay than their colleagues, which encourages them to go for the sort of “news you can use” above and discourages them from analytical or investigative reporting of complex science topics. The consequence, as our journalists contended, is not only the side-lining

but also trivialization and sensationalisation of serious science in the news. Science news increasingly succumbs to tabloid styles, which, as A9 above said, explains why “you see one unproven food risk to another in the media these days”. Quite often, events or issues are dramatized by focusing on shocking details or conflicts to arouse readers. Reporter C5 felt that he frequently found himself in the dilemma between dramatization to attract readers and balanced reporting to uphold journalistic principles:

For example, how would you cover an incident in which the only child of a family dies after vaccination? Some would focus on the parents’ grief and resentment to call for readers’ sympathy. Other, more self-controlled journalists would consider reporting it objectively by analysing whether it was caused by an anaphylactic shock, a medical complication or a technical error. The latter would attract less viewership and the reporter may be paid less for the story. Sensationalism or accountability, which do you choose?

Rampancy of low ethical standards

Most of our interviewees were outspoken about the increasing ignorance of journalism ethics as an immense obstacle for good science journalism. For historical reasons, Vietnamese journalism has traditionally been operating on a very loose ethical base, with most newsrooms following no formal code of ethics and often making decisions on the basis of vague ethical concepts [Nguyen, 2009]. The Vietnamese Journalists’ Association has a generic Code of Ethics that stresses political loyalty as the utmost principle. Over time, this lack of ethical reflection has led many Vietnamese journalists to take for granted many practices that would be seen as highly unethical in other journalistic cultures. The performance of science journalism cannot escape the restraints of this overall professional culture. Part of the failure of science journalism, for example, is because basic requirements like fact checking and source examination are not always seen as a must in Vietnamese newsrooms. “Many young journalists do not often verify information, especially when it comes from state organisations”, said C6. “And editorial boards don’t feel the need to do it either”.

A much more concerning problem is the very public acceptance of bribery-like practices. One of these is the so-called “envelope journalism”, in which journalists easily accept so-called “tea/coffee money” from sources during site visits, interviews or press conferences. As B4 observed:

Many of my colleagues... rummage for event invitations and look for envelopes when they arrive... Their schedule is filled with planned events. As they spend all time on attending events, where is the time for any in-depth investigation? In fact, it has reached a point that how positive a story is depends on how well paid the journalist involved is. Sometimes they would simply ignore an event if there is no payment.

For B4, this could turn Vietnam’s media into a mere PR platform that, in the long run, can only ruin public understanding of science and its contribution to national development. As he observed, Editor A3, however, was rather blunt about this:

I cannot speak for everyone but it’s true, at least for me, that alongside professional duties, I do journalism for a living. Yet the income of a journalist

is not good enough, so I have to find money from outside. It is impossible to seek for a perfect sense of ethics here. [A3]

On the other end, journalists who maintain independence would face revenge from PR agents. As C4 experienced in covering the vastly industry-manipulated debate about genetically modified organism in Vietnam:

A few years ago I was invited to an event organised by Monsanto to introduce its commercial genetically modified maize called bt corn. In the days that followed, it was largely praised as a breakthrough scientific achievement in other news outlets. I wrote three stories, both analysing its benefits to farmers and warning of its potential risks to sustainable agriculture and economic development. I noted in the reporting that GMO was still banned or restricted in many countries. After the series, Monsanto hated me enough to never invite me to any other event.

“Envelope journalism” is only the tip of the iceberg. In fact, under immense pressures for revenues, Vietnamese news outlets have long resorted to the so-called “media contracts” with non-media organisations, especially big businesses. These, often done through PR agencies, typically stipulate that a news organisation, in return for lucrative money, would do two things: (a) promoting clients’ images and activities as *editorial content*; and (b) doing no negative coverage of clients during the contractual term. In essence, it is a form of “soul selling”: instead of acting as an independent monitor of vested interests in the public’s interest, the contracted news outlet becomes a “mercenary”, abusing its legitimacy to serve the interests of those paying for them. Many journalists, including science reporters, are pushed into doing PR agents’ job and being muted about the misdeeds of protected organisations. Our interviewees recalled several investigations being suspended because of “media contracts”. In 2014, C6 was initially assigned by his editors to follow whether fibro that contains asbestos cement could be a cause of cancer. After two years of hard work, his investigation was suspended due to the intervention of the Vietnamese Fibro Federation, a group representing cement producers. “I know a media contract was exchanged for silence”, he said. “It was a very simple way to end a debate in their favour... They just need to make a phone call and to offer a ‘hush money’ deal or a gift and everything is shut down” [C6].

Under “media contracts”, journalists not only become a mouthpiece for vested interests: in some cases, they even collude with unethical PR campaigners to run disinformation campaign. In October 2016, *Young People* (Thanh Nien), an influential daily, published a series of stories claiming that the Vietnam Standards and Consumer Association (Vinatas) found from a survey that 95% of its collected fish sauce samples contained an arsenic level that exceeds the safety limit. In addition, it reported, 85% of traditionally produced fish sauce products did not meet safety standards. Given the integration of traditional fish sauce in everyday Vietnamese life and culture, the news was promptly echoed by more than 50 other news outlets and spread on social media (with 44,000 posts, 95,000 shares and 63,000 comments during 12–23 October 2016). Soon after, authorities found that the Vinatas report, which was based on a non-representative sample of fish sauce, was sponsored by Masan, a corporation that sells industrial, chemically processed fish sauce (in direct competition with the traditional, organic product). The news was

soon corrected, but by then, it had caused chaos in the traditional fish sauce market. *Young People* and several other titles were later exposed to have been paid to engage in a black PR campaign that Masan waged to eliminate its traditional fish source producers,³ through a notorious PR agency, T&A Ogilvy. Not all journalists were intentionally malicious. B2 linked most of the misreporting to the lack of verification under intense pressures that we discussed earlier. For her, many journalists were both naive and careless, rushing to amplify the malicious survey results without checking who was behind them:

Even veteran journalists and prestigious newsrooms fell into that trap. The story was so hot that they forfeited their duty to verify. I saw my colleagues throw all kinds of information they had on news pages to attract views. Nobody bothered with checking the fact. [B2]

That was not the first time the Vietnamese press worked in tandem with Masan's black PR to manipulate scientific evidence and sow public fears. In 2007, Masan used similar tactics to first spread unfounded fears about 3-MCDP contaminant in existing soya sauce products (including one of its own) — before launching a new “3-MCDP-free” soy sauce brand that would soon dominate a fear-driven market. In 2017, with some media outlets, it manufactured a controversy over coffee products being mixed up with battery dust and rock powder, only to later introduce a “pure clean coffee” brand. In those cases, basic professional journalism values and standards were a luxury.

Challenges from the outside

Doing proper science journalism is extremely difficult due not only to formidable internal obstacles but also a range of critical challenges from outside the news industry. This section discusses the two most pervasive external forces: the political elite, which holds a tight grip on science reporting, and the science establishment, which maintains an uncooperative relationship with the media.

Political control. By law, Vietnamese journalism primarily serves as a propaganda and mobilisation machine for the ruling Communist Party and its government, above public information and public forum functions. Journalists are trained to self-censor — i.e. to “dig here, not there” — through daily routines such as newsroom anecdotes, tacit editorial codes, unspoken discipline, reward processes and so on [Nguyen-Thu, 2018]. Government agencies also designated systems to reward journalists who serve them well. The annual National Prize for Science and Technology Journalism, for instance, is operated by the Ministry of Science and Technology in conjunction with the Vietnamese Journalists' Association, to recognise, among others, works that advocate their science policies.

As such, it was no surprise that our interviewees often talked about science journalism as a mechanism to promote science policies for state agencies. Often, that means treating information from these agencies as unquestionable. For those who want to verify things, state agencies are the most difficult places to gather facts and figures. As C1 explained, state agencies are subject to strict regulations on who

³*Young People* stopped short of admitting its unethical practices in its final apology to readers, saying it was simply being duped by Masan.

are allowed to talk on their behalf. Thus, requests for interviews that are deemed sensitive — even in a remote sense — are often rejected. C6 agreed, citing the case of science-related risks:

In our system, journalism is seen as part of the state propaganda apparatus. The press pays little attention to science-related risks... because state agencies do not want to bring them to the public gaze.

Even when the requested information is not sensitive, state officials have other worries — such as a “slip of the tongue” during the interview — and only grant it on the condition that they receive questions in advance and/or see copies before publication. “Even when they don’t do anything wrong, they’re still afraid their views may deviate from the official line and harm their political prospect”, said A3.

Even information that should, by law, be made public is not easy to obtain as state agencies would create many access barriers, especially when it relates to potentially controversial issues, such as pollution, public health measures or science policies. For example, some interviewees were frustrated that Environment Impact Assessment (EIA) for industry projects is often treated as secret documents that they would not be able to obtain unless they have informal and personal sources. As Participant B2 noted, her reporting of big tourism projects at vulnerable natural areas is always difficult because she needs to fight very hard for background information about their legal status — e.g. EIA reports, project licences and boundary arrangements. When exploring the impact of cable cars on the natural landscape and the ecological system of Fansipan (Vietnam’s highest mountain), for example, she gained no access to its EIA and thus was unable to discuss potential threats with experts. Similarly, following massive fish deaths in the North Central Sea of Vietnam, the Taiwanese firm Formosa was discovered to have disposed a huge amount of toxic industrial wastewater from its steel plant directly into the sea. When the story broke out, few reporters could find its EIA report. C5, one of the “lucky few” who obtained the report and came up with a scientifically evidenced story comparing Formosa’s marine environment before and after the disaster, recalled being asked by external colleagues for permission to duplicate his analysis.

That, however, does not mean that journalists are always succumbed to what they are told to do. Deep-digging coverage of science risks and critical analyses of science policies are still found here and there in the Vietnamese media, especially progressive dailies. To achieve such coverage, however, is often an uphill battle facing interventions at any stage. The common approaches by state agencies are either friendly negotiations with or, when necessary, verbal orders to editorial boards. “Some time ago, in the middle of a long process of gathering facts and figures for an important controversial health issue, I was suddenly told to suspend it because the Ministry of Science and Technology intervened to say that they didn’t like it”, said C1. Participant C5 said that his name was even in the “blacklist” of a local authority “because nine in ten stories I report are about their wrongdoings”.

Lack of cooperation from the local science community. In addition to politics, the lack of support from the science community was a common topic in our interviews. There is a shortage of local expertise in many areas, making it difficult, sometimes impractical, for science reporters to find good sources and/or to dig

into issues. The further danger, as noted by several interviewees, is that some fame-thirsty scientists would seize opportunities to raise their voices in the media about areas where they have minimal or zero expertise. “Regardless of their specialism, they are eager to comment on everything, from history to biology”, said a senior editor [C2]. “These omnipotent scientists can only confuse journalists with their useless comments”. Where local expertise is available, the challenge is to get scientists to talk. With a few exceptions, Vietnamese scientists are not willing, often reluctant, to work with the media due to a number of peculiar reasons:

First, most scientists do not see the value of making their work known beyond academe and their voices heard in the wider community. “They are not open to the media because they see their job as doing research rather than communicating science to the public”, said B3. Reporter B1 agreed, citing a case in which he tried hard but failed to obtain an interview with a local scientist who was among Thompson Reuters’ 100 most cited researchers during 2014–2017. “Genuine scientists would rather work silently and tend to forget that science is only meaningful when it is juxtaposed with the social, economic and political issues of the time”, he said.

Second, interviewees noted a widespread fear among scientists of their research being misreported, distorted, or sensationalized. “They are very fearful”, said one. “They keep asking us to use their original text in our stories because, for them, editing would render their work wrong”. In many cases, the extent to which scientists work with journalists depends solely on their personal relationships over time.

Third, there are a range of peculiar organisational factors that discourage scientists from talking to the media. One is the feudal and bureaucratic structure of science institutions: Vietnamese scientists, legally classified as public servants, are required to obtain permission before speaking to the media. “Spokesperson regulations” — rules specifying who can appear in the public with their formal job affiliation — were mentioned by some interviewees as a key impediment to exchange between science and journalism, because they make scientists reluctant to talk or slow in responding to interviews. As an example, C6 cited the University of Agriculture, where “all lecturers are stipulated not to use their working titles in interviews with the press”. Editor A3 said that “many scientists are very enthusiastic in the early stage of their career but, after years of having their efforts ruined by organisational pressures, retreat into their shell to save themselves from troubles”. In the same vein, C1 commented that retired scientists are much more at ease talking to journalists than active ones. As science is heavily politicized and much science information is under state control, said another, it is painfully time-consuming for journalists to convince science sources to engage, “unless they are politically required to respond”.

Finally, scientists are reluctant to work with journalists also because they themselves are not always up to the standards. As C6 explained, “scientists, decision makers and businesses often hide information from each other for fear of their research flaws being exposed”. Others added that a large amount of poor and unethical research could get through all “independent” checks and balances with the help of money and/or power connection. “Often, the fate of such research is sealed in researchers’ drawers and a huge amount of public money is wasted”, said

Editor A7. “But exposing such research is difficult as it often has powerful and well resourced people behind it. This is a big debt to the public that Vietnamese journalists have yet to pay”.

Vietnam in the Global South's context

Although the views by this study's participants cannot be generalized, our eight-year research paints quite a clear, detailed picture of the gap between what Vietnamese science journalists want to do and what they can practically do. The interviewed journalists hold quite a strong view on the normative relationship between journalism, science and development. They want this relationship to contribute to national development through serving the public — not the science establishment — first and foremost. Through enhancing science literacy and connecting the laity with scientific advances, they aim to elevate science to the top priorities in development policies. At the same time, many want to monitor its trajectory to ensure that it does not move too far from the common good of their people and, ultimately, nation. Such perceived roles, however, cannot be effectively enacted because the journalistic operation environment offers very little to bolster and foster them. Struggling in a heavily bureaucratized, politicized and alienated science world, with little practical support and considerable impediments from inside and outside the news industry, Vietnam's science journalism does not seem to have been able to do well enough to meet its development needs and demands. Sometimes, as seen above, it has been done very badly, with severe damages to local communities.

At the risk of oversimplification, this Vietnamese situation is more or less typical of what has been seen elsewhere in the Global South. It has become clear, for example, that science journalists of the South attach their duties first and foremost to developmental causes and nation-building processes [Hase, Mahl, Schäfer & Keller, 2021; Nguyen & Tran, 2019]. Often framing science and technology through the lens of “social purposes”, “social roles”, “social changes” and “social responsibilities” [Rosen, 2014], they aspire to use the media to mobilise the public, build science literacy, embed science knowledge into national socio-economic development, and empower citizens and policy-makers to adopt/import the right science and technology for that development [Appiah et al., 2012; Ashoorkhani et al., 2012; Asiyambi, 2015; Estella, 2020; Fang, 2014; Joubert, 2001; Massarani, Entradas, Neves & Bauer, 2021; Mercado, 2012; Rashid, 2020]. Such aspirational zeal, however, meets with the cold harsh reality of science journalism being undermined by formidable socio-economic, professional and structural challenges, at both micro/newsroom and macro/society levels. Despite its scattered nature, the relevant literature on science in developing societies shows a clear tension between the perception and the enactment of its roles and functions. The faint existence of science journalism witnessed in Vietnam resembles the generally poor state of the Global South's science journalism. With little investment, the fastest, cheapest and easiest way for the media to ensure a steady science news supply is to rely heavily on translation from foreign sources, especially the media of the Global North [Joubert, 2007; Shanahan, 2006; Tagbo, 2010]. Whenever local science is covered, it usually does not go beyond straight episodic reports of facts, leaving in-depth, analytical accounts a rarity [e.g. Castelfranchi, Massarani & Ramalho, 2014; DeRosier et al., 2015; Du & Rachul, 2012; Jurberg, Verjovsky, Machado & Affonso-Mitidieri, 2009; Lü, 2009; Masood, 2005; Midttun, Coulter, Gadzekpo & Wang, 2015]. General reporters, with neither the specialist skills nor the confidence

to do science journalism, are often tasked to cover topics such as medical discoveries, climate change, stem cell research, nuclear power, biotechnology, nanotechnology and so on [Appiah, Gastel, Burdine & Russell, 2015; Aram, 2011; Bauer, Howard, Romo Ramos, Massarani & Amorim, 2013; Kakonge, 2011; Shanahan, 2009]. In most parts of the South, media interest in science issues only peaks during short periods of certain global events (e.g. UN Climate Change conferences, World AIDS Awareness Day) or some intense science-related dramas and debates [Boykoff, 2010; Das, 2012; Kakonge, 2013; Pratt, Ha & Pratt, 2002; UNESCO, 2011].

Delving further into these problems, again, we believe that Vietnam offers a miniature of the developing world in several respects. First, political impediments to science journalism are seen everywhere. As a recent global survey found, science journalists around the Global South face tremendous problems in their efforts to access and obtain information from governments [Massarani et al., 2021]. In democratic systems, e.g. India or the Philippines, interventions often take the form of tactics to restrict access to sensitive or controversial research, to “subsidise” news work through the provision of government information services (e.g. press releases), or to ensure political voices dominate the public debate about science and science policies [Asoro, 2012; Middtun et al., 2015; Mula, 2007; Navarro & Hautea, 2011; Patairiya, 2007]. In authoritarian systems akin to Vietnam, such as China and many parts of the Middle East, the political grip on science journalism includes not only covert measures but also overt ones, such as directly ordering a news outlet to stop sensitive stories or preventing scientists from speaking up about science issues and policies [Jia & Liu, 2014; Zhang, 2015]. Without active and independent science scrutiny, journalists directly or indirectly deprive the public right to access science information, giving the state an exclusive power to decide which science and technology to be adopted or avoided for development.

Second, like those in our study, journalists of the Global South encounter a troublesome working relationship with scientists, often facing the shortage of local scholars who are willing to talk publicly on new science developments [Alhuntushi & Lugo-Ocando, 2020; Khan, 2017]. This might be because local scientists lack relevant and up-to-date expertise, or they hold grudges against being misrepresented in the news [Joubert, 2007; Michael & Binta, 2013; Olet & Othieno, 2015], or they do not regard public communication as a professional duty [Ndlovu, Joubert & Boshoff, 2016; Zhao et al., 2014]. The few who are conscious and capable of doing public communication as a social responsibility are too busy to participate in news spaces [Congjuico, 2016; Ndlovu et al., 2016]. While such uneasy science-journalism relationship is also seen in developed countries [Lo & Peters, 2015; Nelkin, 1995], it is often worsened in developing ones by other peculiar factors. For instance, as seen in the Vietnamese data, the reluctance to deal with journalists stems in part from scientists’ fear of being retaliated or manipulated by state powers, especially in systems where scientists are formally attached to the state and its political policies and ideological line [Jia & Liu, 2014; Nguyen & Tran, 2019; Zhang, 2015]. That has not included the fact that many scientists themselves are too afraid of exposing their weaknesses or even misconduct to others [Khan, 2017].

Third, the somewhat anti-science culture in Vietnamese newsrooms is nothing new. It is widely known that newsrooms treat science content more as a nice-to-have

than a must-have, investing little in building specialist expertise or providing practical resources for science to be covered in good quantity and quality [Elia, 2019; Joshi, 2018; Valderrama, Nahuelhual & Roberts, 2014; Mochahari, 2013; UNESCO, 2011; van Zuydam, 2019]. In many places, this manifests not only in news executives' minimal appreciation and half-hearted support for science topics, but also in work patterns and flows that can hardly breed and foster sound science journalism. This has been somewhat worsened in the digital transformation of journalism, especially the continued decline of traditional revenues (and thus the gradual disappearance of "unpopular" news areas such as science and arts) and the increasingly metrics-driven urge for clickbait science content [Hayden & Check Hayden, 2018]. Our research also unveils the rather "intangible" but destructive effects on science journalism of a general media environment that systematically overlooks and disregards ethics. This can be linked to many factors, e.g. the aforementioned propaganda mindset, but it is noteworthy here that the Vietnamese media still allow people to operate without much prior or on-the-job ethical training [Nguyen, 2009]. Since the lack of professional training is another common problem in the Global South, we suspect that some of the misconduct in Vietnam's science journalism would be found elsewhere. In fact, when interviewing 30 journalists from other parts of Southeast Asia for SjCOOP Asia, we found that low ethical bars emerged quite strongly, with considerable anecdotal evidence regarding science journalism [Nguyen, 2014]. More systematic research is much needed to obtain a fuller understanding of this critically important problem.

Where to from here?

Overall, it can be concluded that science journalism of the Global South, bearing the many systemic problems exemplified by Vietnam, faces an uphill battle to accomplish its perceived pro-development mission. Besieged from all sides, it struggles to establish its legitimacy as a specialist news beat and an integral part of national — and, by extension, global — development. The implication of this should not be underestimated. For science as a global public good to serve humanities well, it needs to reach people in informed, engaged, inclusive and socio-culturally sensitive manners. This is especially critical for developing countries, which mainly import science from developed ones and rely primarily on their media for science news and analysis. Without a strong base of professionalism in science journalism, it is extremely hard to see how developing countries will enjoy such effective diffusion of scientific knowledge. The formidable challenges that this research has identified must be systematically and holistically addressed through coordinated efforts from multiple stakeholders on both national and global scales — the science community, the political elite, the governance bodies, the education system, the lay publics, and the third-party sector. Given the fast pace of science today and the unprecedented chaotic science communication environment, this must be seen as an urgent cause for humanity. We thus call on multilateral science and development governance organisations (such as UNESCO, UNDP, UNEP and WHO), ODA providers, research funders, philanthropists and so on to work closely and urgently with multinational professional bodies — such as the World Federation of Science Journalists or International Science Council — to find and implement practical and sustainable solutions to current problems.

Although there is no "quick fix", we would like to end this essay with a positive note. Through the eight years of our research, we witnessed a considerable difference that professional training and mentoring could make in a short time.

As closed readers of this essay might have noted, there are considerable variations in the professional attitudes of SjCOOP-trained science journalists and those who never had any short- or long-term training. The former (anonymised as C1 to C6 above) are more keenly conscious of their professional duties and possess a stronger professional mindset in handling daily challenges to critical science reporting. In contrast, untrained reporters display a more passive and less inquisitive approach to science reporting. Instead of doing independent work, they rely too much on diary events and PR-fed information, placing an easy faith in government statements, science reports, conference papers or press announcements. In fact, one of the interviewed editors was astonished to see a reporter returning from SjCOOP “as if he were reborn with not only new writing skills but also an innovative vision to reform our science news provision” (A2). Even though they are not always properly recognised or appreciated by their senior colleagues, these reporters are always there to strive for the best possible and have produced quite a number of far-reaching science scoops since then. This was in line with what we observed amongst non-Vietnamese trainees in the same programme [Nguyen, 2014]. Such successes bring hopes, offering some rare insights into how training initiatives might help improve the quality of science journalism in the Global South in a relatively short timeframe. If sustained and expanded, such training could lay the foundation for science journalism to overcome some of its internal challenges, so that it can concentrate more on dealing with its external challenges, for the sake of better life and more sustainable development in less advantaged parts of the world.

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