ENVIRONMENTAL GOVERNANCE TOWARDS MICROPLASTIC POLLUTION: THE CASE OF PERSONAL CARE AND COSMETICS PRODUCTS IN BANGLADESH

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ABSTRACT

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Abstract

Recent years have seen increased attention of academics, practitioners and policymakers regarding microplastic pollution, which is posing a severe threat to ecosystems and human health. Microbeads, a subset of microplastics, are intentionally added to personal care and cosmetics products (PCCPs). Many countries in the global North have already banned the use of microbeads in PCCPs. The literature, however, has largely overlooked microplastic pollution and governance intervention against the use of plastic microbeads in PCCPs in developing countries. This paper attempts to fill this gap by taking Bangladesh as an example, where evidence of microbead pollution has recently been discovered. The purpose of this study is to increase understanding of the perceptions, views and recommendations of policymakers and other stakeholders about microplastic pollution from microbead-containing PCCPs in Bangladesh and related governance and policy intervention. This exploratory study uses qualitative research method and collects primary data through semi-structured interviews of 12 key informants, comprising relevant government officials, industry representatives, academia and civil society actors in Bangladesh. The theoretical framework for this study has been drawn from governance and policy literature. The collected data has been transcribed and analyzed using qualitative content analysis. The findings suggest that the awareness of microbead pollution among policymakers and other stakeholders is low, but attitude towards microbead use is quite strong, many asking for bans. The findings put forward some interesting drivers and barriers perceived by the participants in policy making and implementation against microbead use.

Keywords	
Microbead, perceptions, policy making, policy implementation, drivers, barriers, complexities, developing countries, global South, PCCPs	

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1   INTRODUCTION

*Plastic scrub beads were previously contained in a limited number of beauty &
personal care products, such as facial cleansers, soaps, shower gels and body
washes. We used them because they can gently unblock pores and remove dead
cells from the skin's surface. […] We stopped using plastic scrub beads in 2014 in
response to concerns about the build-up of microplastics in oceans and lakes. (Uni-
lever, 2018)*

*In a recent study, Environment and Social Development Organization (ESDO)
[…] found 50% of Pond's Face Wash contains microbeads. Even their expensive
products such as Dove brand's 40% Face Wash products contain microbeads in
them. Even another popular brand Close Up was found with over 60% microbeads
in their toothpaste products. (Maitra, 2016)*

The two quotes presented above expose the double standards played by corpo-
rations in countries with various levels of environmental governance and regu-
latory settings. Mounting scientific evidence of environmental damage, strong
advocacy coalitions, growing public concern against plastic waste, early legisla-
tive ban in powerful markets, and relatively weak political and corporate re-
sistance have seen the use of plastic microbeads in personal care and cosmetics
products (PCCPs) being banned or voluntarily phased-out in some countries
(Dauvergne, 2018). However, governance and policy interventions to reduce the
use of microbeads in PCCPs across the globe have been rather limited and frag-
mented (Xanthos & Walker, 2017; Dauvergne, 2018). This may lead some other
countries, especially in the global South where the conditions mentioned above
may not be met, to becoming dumping grounds and thus more vulnerable to mi-
crobead and microplastic pollution (Girard et al., 2016). On that note, a few ques-
tions arise. Are the policymakers of these countries aware of this pollution? How
about other policy and political actors, e.g. from relevant industry and civil soci-
ety groups? Do they perceive this to be a problem, or just one of many other
problems? Would they bother addressing this issue, and if so, do they have any
particular solution in mind? What are the problematics that may arise in pursu-
ing such governance and policy endeavors?

The development and use of plastics – a group of synthetic polymers typi-
cally derived from fossil fuels – in numerous applications have not only benefit-
ted human being, but also incurred considerable costs across social, environmen-
tal and economic dimensions (UNEP, 2016). A growing body of literature has
focused on the abundance of plastic particles in marine environment and ecosys-
tems (Sundt, Schulze & Syversen, 2014). Environmental problems with larger
plastic objects, such as entanglement of wildlife in fishing gear, and with smaller
objects, such as ingestion of plastic debris by marine organisms, have also been
documented (GESAMP, 2015). However, until recently, aquatic pollution by mi-
croscopic plastic particles, also known as microplastics, had been rather unex-
plored by the scientific community (Sundt et al., 2014).

Microplastics, due to their minuscule sizes, pose a severe threat to biota since these non-biodegradable particles may be ingested by a wide range of organisms, various plastic additives applied to them may leach out hazardous chemicals, and a range of water-borne contaminants, such as aqueous metals or persistent organic pollutants (POPs), may be adhered to the plastic surface (Cole et al., 2011). Microplastic release in the aquatic environment has been reported to have adverse effects on shellfish reproduction and growth, coral nutrient uptake and zooplankton among others, and these may, in turn, have implications for marine ecosystem, tourism industry, commercial fisheries, and wider food chain (Eunomia, 2016). Microplastic pollution is relevant not only to marine environment, but also freshwater systems (Lambert & Wagner, 2018). Current understanding of the effects of microplastics on human health is rather limited, but this does not eliminate the potential risks, such as localized particle toxicity and chemical toxicity, likely to result from leaching of component monomers, endogenous additives and absorbed environmental pollutants (Wright & Kelly, 2017; Smith et al., 2018).

A subset of microplastics is plastic microbeads, which are intentionally added to personal care and cosmetics products, such as facial or body scrubs, toothpastes and cleaning products as exfoliants or cleansing agents (Environment Audit Committee, 2016). These plastic microbeads were first developed by Norwegian chemist John Ugelstad in 1976 and have been successfully applied in cancer research and HIV/AIDS treatments, but at the turn of the millennium have gained popularity in their application in personal care and cosmetics products (PCCPs) (Dauvergne, 2018). Expert estimates suggest that each year as much as 680 tonnes of plastic microbeads are released in the UK alone, and a single shower may lead to the discharge of 100,000 plastic particles going down the drain, resulting in severe damage to the ecosystem and human health (Environment Audit Committee, 2016). Most microplastic releases are unintentional and diffusive in nature, and lack immediate policy remedy, but microbeads in PCCPs are intentionally added and thus easy to remove or ban (IUCN, 2017).

There is a global policy vacuum that can address the microbead problem across the globe, and due to the transboundary nature of the issue, even one country failing to restrict the microbead release to the environment is highly likely to exacerbate an already severe condition of the aquatic ecosystem (Graney, 2016; Guerranti et al., 2019). Unfortunately, policymakers and other stakeholders across the globe have so far paid limited attention towards this pollution (Xanthos & Walker, 2017; Dauvergne, 2018). There have been two major control mechanisms adopted fragmentarily in various countries across the world: product ban and voluntary agreements (UNEP, 2016). Only a handful of the countries, particularly in the Global North, have been pioneering in these policy endeavors (Xanthos & Walker, 2017). It appears that developing countries are lagging far behind their industrial counterparts in tackling microplastic pollution. There is a strong likelihood that these countries with little/no regulation in place may become the dumping ground for microbead-containing products banned or removed from other countries with stricter regulation (Girard et al., 2016).

Some scholars (Dauvergne, 2018; Girard et al., 2016) argued that policy-making and policy implementation regarding microbead and microplastics pollution could be challenging for developing countries with weak environmental governance and institutional capacity. However, what challenges specifically policymakers and other policy actors of these countries would face in dealing with microbead pollution are yet to be explored. This study attempts to fill this gap by taking Bangladesh, a developing country situated in South Asia, as an example. With a large (over 160 m) population and a growing economy (7,1% in 2016) (World Bank Data, 2018), Bangladesh is an attractive and expanding market for beauty and personal care products, which are increasingly consumed by the elites, middle-class and lower middle-class people, driven by rising disposable income and western consumption trend (Euromonitor, 2019). In Bangladesh operate many multinational companies (namely Unilever, Proctor & Gamble, Johnson & Johnson and Reckitt & Benckiser) which are up against strong competition from local firms, such as Square Toiletries and Kohinoor Chemical among others, for capturing the thriving market. In addition, to meet the growing demand, a lot of cosmetics and toiletries products are imported. It is, therefore, important to make sure that such a growing industry does not impose additional burden to the aquatic environment which has already been struggling with existing contaminations (Shamsuzzaman et al., 2017).

Motivation for this study stemmed from observing global outcry and growing evidence of harm caused by microplastic pollution to the marine environment and aquatic ecosystem. Following a large volume of literature concerning microplastic pollution has shown a clear knowledge gap from developing countries. In order to gain empirical insights on this issue, I contacted Environment and Social Development Organization (ESDO), a Bangladeshi environmental NGO, which has been working for environmental conservation and social justice since 1990. ESDO has been working on a project, called "Combating the Pollution Threat from Micro plastic Litter to Save Marine Health in the Bay of Bengal", funded by Plastic Solutions Fund. I applied for an internship position at ESDO, got selected, and worked there from 17 October 2017 to 16 January 2018. ESDO did a market survey and found microbeads in some products; fish samples collected from different cities also provided evidence of the existence of microplastics (ESDO, 2016). It also conducted a baseline survey among 3800 respondents, comprising consumers and retailers, and found awareness level among consumers about microbead pollution very low (ESDO, 2016). I personally was more interested in policy and governance aspects of the issue, and, therefore, wanted to conduct an exploratory study on various policy and political actors, including government officials, private actors, scientists and civil society groups. Working as an intern at ESDO helped me gain empirical insights and access to the key informants.

Since the issue of microbeads is mostly covered in the literature from developed country perspectives, the topic for this study can be considered fresh in a sense that it seeks to put forward the issue from a developing country perspective. This thesis intends to increase understanding of the perceptions, awareness and

knowledge level of relevant policymakers, e.g. bureaucrats, and other stakeholders, including business representatives, scientists, and civil society groups, about the microbead pollution from PCCPs in Bangladesh and their views and recommendations about the governance mechanism and effective policy actions to tackle this problem. Four research questions have been developed to pursue the research aim. The first question attempts to understand the level of awareness, knowledge and attitude of the policymakers and other stakeholders regarding microbead pollution from PCCPs in Bangladesh. The second research question seeks to capture the opinion of the study participants as to what policy instruments they perceive to be the most effective in the context of Bangladesh. The third question attempts to discover relevant institutions and structures of environmental governance mechanism in Bangladesh that the participants perceive to be the most relevant. Finally, the fourth question seeks to identify perceived barriers in policy-making and policy implementation regarding microbead pollution from PCCPs in Bangladesh.

To answer the research questions, primary data was collected through qualitative interviews of the key informants, representing government agencies, industry representatives, experts and civil society groups, who are very familiar with and often involved in high-level decision-making process regarding environmental governance in Bangladesh. The data for this exploratory study was collected through 12 qualitative interviews, 7 of which were conducted face-to-face, while 5 others over telephone. The major challenges regarding the data collection process included identifying the key informants and getting access and adjusting scheduling. A semi-structured questionnaire was devised, the themes of which were adapted from the work of Anderson and her colleagues (2016), who had conducted a qualitative study exploring the perceptions and views of environmentalists, beauticians and students in the UK on the use of microbeads in personal care products, their sources of information, and their opinions on possible solutions. I modified the questionnaire to include the perceptions and views of representatives of relevant industry, government, academia and civil society groups taking the example of a developing country with theoretical lenses from policy and governance literature. Data analysis for this study has been carried out using the method of qualitative content analysis following the guidelines provided by Creswell (2009).

The scope of this study is limited in various ways, e.g. in temporal, spatial and topical boundaries. Firstly, the data for this exploratory study was collected during November-December, 2017 (9 interviews), and November-December, 2018 (3 interviews). The interviewees represent relevant government departments and agencies, industries, academia and civil society groups, but their representation cannot be generalized. Moreover, this study deals with only pollution from using microbeads in personal care and cosmetics products in Bangladesh, thus ignores pollution from other types of microplastic pollution in Bangladesh, and also any type of microplastic pollution in other countries. Finally, this study only seeks to capture the perceptions, views and recommendations of the interviewees from their personal capacity. Even though the interviewees held

important positions in their respective fields and had years of experience, their responses were only their own personal expressions, and thus cannot be interpreted as official statements of the organizations they represented.

The contribution of this study is three-fold. First, this study attempts to find out perceptions and views of policymakers and other stakeholders from a developing country perspective, which had been missing in the literature dealing with microplastic and microbead pollution. Second, this study seeks to connect literature from microplastic pollution and that of policy and governance. Third, this study seeks to identify perceived drivers and barriers to policy action against microbead pollution in Bangladesh in order to formulate a course of action.

This thesis is composed of six chapters, the first chapter is the introduction and the remaining five chapters of the thesis are as follows. Chapter two seeks to give an overview of microplastic pollution, different types of policy interventions adopted globally to address this issue, various factors contributing to this development and relevance of Bangladesh in this connection. Chapter three presents the theoretical background for this study drawing elements from governance and policy literature. Chapter four and chapter five elaborates research design and research findings. Chapter six ends the thesis with discussion and conclusion.

2   AN OVERVIEW OF MICROPLASTIC POLUTION

This chapter provides some technical and background information based on literature review on microplastic pollution and relevant governance mechanisms. The first section illustrates the lack of consensus in the literature regarding the definitions of microplastics and various sources of microplastic pollution. The next section focuses on plastic microbeads and their use in personal care and cosmetics products. The following section summarizes the damaging effects of microbeads and microplastics on the environment and human health. This is followed by a detailed analysis of the global policy trend tackling microbead pollution from PCCPs, along with the corresponding contributions of different actors to that development. Section 5 summarizes different types of policy interventions across the globe to tackle microbead pollution from personal care and cosmetics products, seeking special attention to global south. The final section explains why Bangladesh is very relevant with regard to microbead and microplastic pollution and why it is significant and timely to make a governance and policy intervention in this case.

2.1   Microplastics: discords in definitions and sources

There is a clear lack of consensus and consistency in defining 'microplastics' in the extant literature (Sherrington et al., 2016). The term, owing to the absence of agreed nomenclature and practical difficulties in sampling and measuring, has been generically used to refer to small pieces of plastic (GESAMP, 2015), including but not limited to tiny plastic fragments, fibres and granules of various size-ranges (Cole et al., 2011). Sundt et al. (2014, p. 7) along with some explanatory comments listed some of the characteristics of microplastics as 'solid phase material', 'Insoluble in water', 'Synthetic', 'Slowly degradable', 'Made from plastics', and 'Small size < 5 mm'. Lassen et al. (2015, p. 33) defined microplastics to be "persistent, solid particulates composed of synthetic or semi-synthetic polymers and physical dimensions of 1 μm – 5 mm originating from anthropogenic sources", while GESAMP (2015) report considered the size of microplastics to be 1 nm to <5 mm. It is observed that the lower size limit is often contested for pragmatic reasons, varying due to the sampling devices for respective study designs (Magnusson et al., 2016).

Microplastics are typically divided into two types: primary microplastics and secondary microplastics (Boucher & Friot, 2017; GESAMP, 2015; UNEP, 2016). However, there are obvious differences as to how primary and secondary microplastics are defined. Boucher & Friot (2017) in their report for IUCN defined primary microplastics as those directly released to the environment as tiny particles, while secondary microplastics are defined as those derive from larger plastic items. On the other hand, GESAMP report (2015) defined primary

microplastics as particles originally manufactured to be of that (micro) size, whereas secondary microplastics break down from larger objects. Both versions consider, for example, intentionally added microplastic, such as plastic microbeads used in personal care and cosmetics products, to be primary microplastics and those broken down from larger items, such as discarded polythene bags, through photo degradation and weathering processes as secondary microplastic. However, while the IUCN report considers microplastics deriving from the abrasion process during manufacturing, use and maintenance of larger plastic objects, such as erosion of car tyres during driving and release of microfibres through washing of synthetic textiles, to be primary, the GESAMP and UNEP reports count them to be secondary.
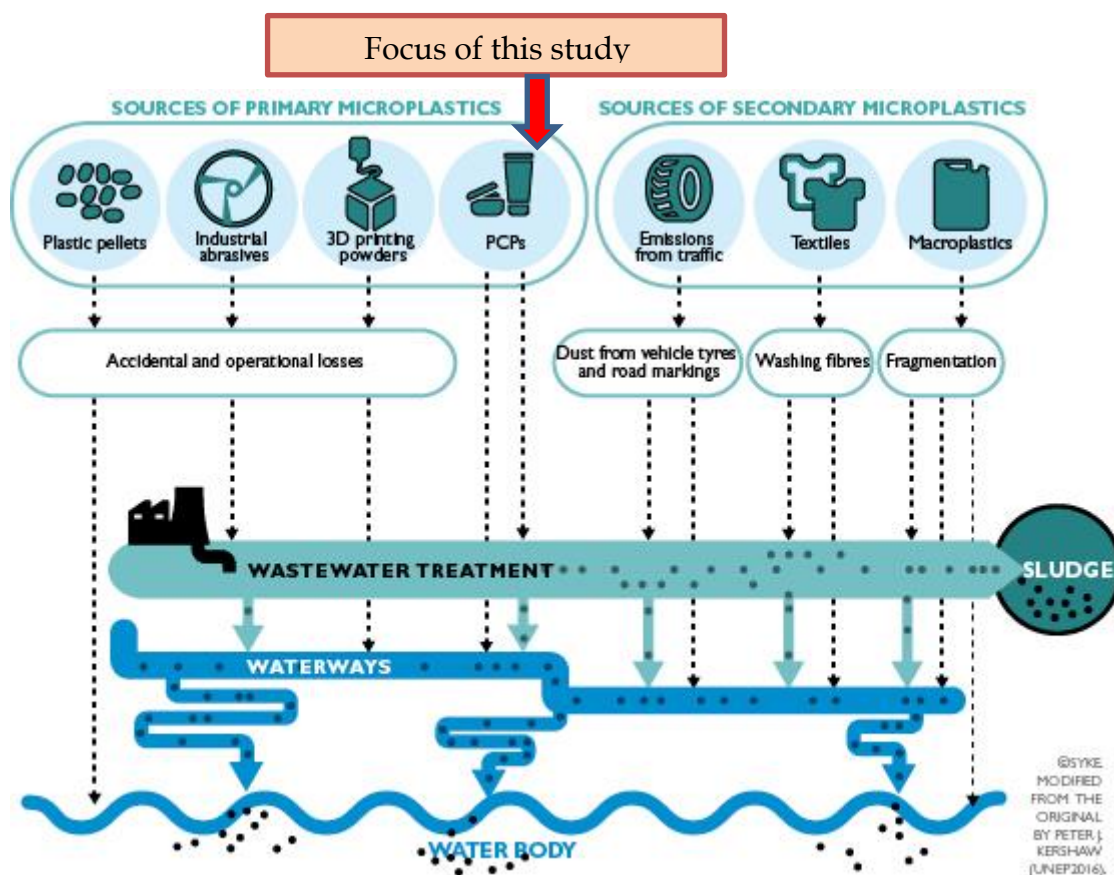
FIGURE 1   Sources of microplastics (SYKE, 2017; UNEP, 2016)

This study focuses on intentionally added microplastics, also known as plastic microbeads, to personal care and cosmetics products (PCCPs).

2.2   Plastic microbeads in PCCPs

Microbeads are a subset of microplastics that are intentionally added to personal care and cosmetics products, such as facial or body scrubs, toothpastes and cleaning products as exfoliants or cleansing agents (Environment Audit Committee, 2016). These plastic microbeads were first developed by Norwegian chemist John Ugelstad in 1976, have been successfully applied in cancer research and HIV/AIDS treatments, but also used in personal care and cosmetics products since 1990s and early 2000s (Dauvergne, 2018). These beads will be considered microplastics if they are "synthetic polymers and/or copolymers (plastics), solid phase materials (particulates, not liquids), insoluble in water, nondegradable and small size (maximum 5 mm, no lower size limit is defined)" (UNEP, 2015, p. 11). On a similar note, Environment Canada (2015, p. 5) defined microbeads as "synthetic polymer particles that, at the time of their manufacture, are greater than 0.1 μm and less than or equal to 5 mm in size. This includes different forms of particles including solid, hollow, amorphous, solubilized, etc.". A narrower definition is used by Cosmetics Europe and other manufacturers that reads: "Plastic microbeads designate synthetic non-biodegradable solid plastic particles >1 μm and <5 mm in size used to exfoliate or cleanse in rinse-off cosmetic products" (Sherrington et al., 2016, p. 204). Therefore, there is a clear lack of consensus as to how microbeads are defined depending on who is defining and what are the stakes involved.

Depending on the polymer type, composition, size and shape, the plastic ingredients may be used in the PCCPs for a variety of functions; for example, polyethylene (PE), which accounts for more than 90% of the microbeads, can be used as abrasive, film forming, viscosity controlling, binder for powder; polypropylene (PP) can be applied as bulking agent and viscosity increasing agent; polystyrene for film formation; polyethylene terephthalate (PET) as adhesive, film formation, hair fixative and aesthetic agent, and polymethyl methylacrylate (PMMA) as sorbent for delivery of active ingredients (UNEP, 2015). Plastic microbeads are preferred to natural alternatives, such as cocoa beans, ground almonds, apricot kernels, pumice, sea salt and oatmeal, because of their versatility, consistency and ease in product formulation (Environment Audit Committee, 2016).

Expert estimates suggest that each year as much as 680 tonnes of plastic microbeads are released in the UK alone, and a single shower may lead to the discharge of 100,000 plastic particles going down the drain (Environment Audit Committee, 2016). What's more, some personal care and cosmetic products, such as an exfoliating shower gel, may contain as much plastic (microbeads) as ingredients as it is used in the product packaging (e.g. the plastic tube it is contained in) (UNEP, 2015). Microbeads going down the drain can cause serious harms to the ecosystem and human health.

2.3 Damaging effects of microbeads and microplastics

Microplastic pollution is relevant not only to marine environment, but also fresh-water systems (Lambert & Wagner, 2018). Microplastics, due to their minuscule sizes, pose a severe threat to biota since these non-biodegradable particles may be ingested by a wide range of organisms, various plastic additives applied to them may leach out hazardous chemicals, and a range of water-borne contaminants, such as aqueous metals or persistent organic pollutants (POPs), may be adhered to the plastic surface (Cole et al., 2011). Microplastic release in the aquatic environment has been reported to have adverse effects on shellfish reproduction and growth, coral nutrient uptake and zooplankton among others, and these may, in turn, have implications for marine ecosystem, tourism industry, commercial fisheries, and wider food chain (Eunomia, 2016).

FIGURE 2   Environmental fate of microplastic (Sharma & Chatterjee, 2017, p. 21541)

Microplastics, including microbeads, are bioavailable to marine organisms, such as corals, zooplanktons, lobsters, worms, sea urchins and fish among others (Browne et al., 2008). These miniscule particles, when ingested by these organisms, get bioaccumulated in the food chain and reach higher tropic levels (Gregory, 1996). Evidence of microplastics has been spotted in seabirds, turtles,

crustaceans and fish (Cole et al., 2011; Derraik, 2002), which have been observed to suffer from clogging of intestinal tract, suppression of feeding due to satiation, inhibition of gastric enzyme secretion, imbalance of steroid hormone levels, delay in ovulation and infertility (Wright et al., 2013; McCauley & Bjorndal, 1999). Both suspension and filter feeders, such as whales and sharks, as well as deposit feeders, such as crabs and shellfish, are exposed to direct microplastic ingestion (Guerranti et al., 2019). Chronic effects of microplastic ingestion by these organisms may lead to reduced food consumption and even premature mortality (Wright et al., 2013; Derraik, 2002). In addition, microplastics often contain chemical substances like toxic additives and monomers which have reasonably large area to volume ratio and thus are more likely to absorb hydrophobic pollutants, such as POPs, from the water bodies (Thompson, Browne, & Galloway, 2007; Mato et al., 2001). Thus, when bioaccumulated and biomagnified through the food chain, these microplastic pollution may have cascading effects in the ecosystem (Sharma & Chatterjee, 2017).
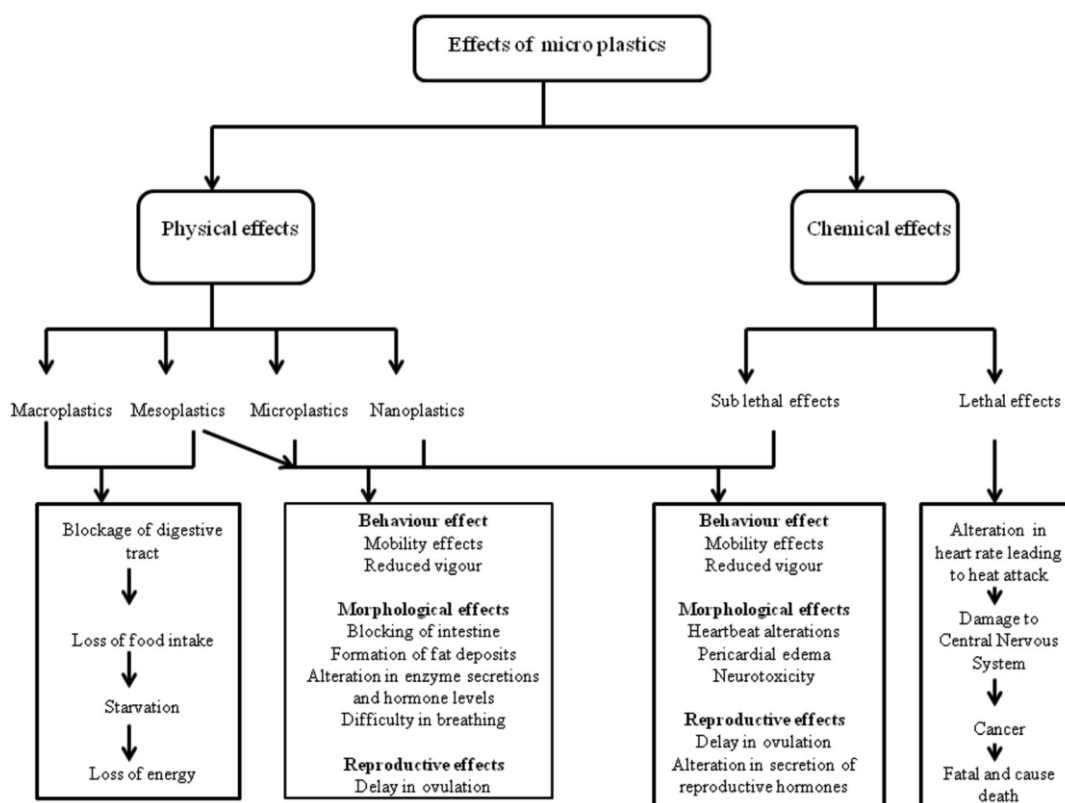
FIGURE 3   Adverse effects of microplastics on animal health (Sharma & Chatterjee, 2017, p. 21538)

Alarmingly, human health may also be affected by microplastic pollution through physical and chemical pathways (Smith et al., 2018). Direct physical exposure to microplastics for humans can take place through their use of personal care and cosmetics products, such as cosmetics, toothpaste, scrubs and hand washes (Sharma & Chatterjee, 2017). Another physical pathway of microplastic

exposure to humans is via consumption of seafood, which is a significant dietary component. Even though human body can get rid of a large part of ingested microplastic through its excretory system, retention still can happen owing to a number of factors, such as size, shape, polymer type and additive chemicals of the microplastic ingested (Wright & Kelly, 2017). Microplastics could be even inhaled by humans in the course of bubbles bursting during white cap formation and wind stress, or due to waves breaking in the coastal surf zone (Wright & Kelly, 2017). These microscopic particles, if inhaled, can get to the respiratory tract and eventually be trapped by the lung lining fluid, thus can be a serious health hazard, especially for the population with weak, or impaired, mucociliary clearance mechanisms (Wright & Kelly, 2017). On the other hand, microplastics containing chemical additives may cause toxic effects, which can also be compounded by POPs, which may be absorbed by microplastics and subsequently bioaccumulated to marine animals and subsequently humans (Smith et al., 2018; Wright & Kelly, 2017). Current understanding of the effects of microplastics on human health is rather limited, but this does not eliminate the potential risks, such as localized particle toxicity and chemical toxicity, likely to result from leaching of component monomers, endogenous additives and absorbed environmental pollutants (Wright & Kelly, 2017; Smith et al., 2018).

Pollution from microbeads in PCCPs is relatively small (compared to other types of microplastic), yet significant and avoidable, and thus may take priority being a low hanging fruit in the context of combatting wider plastic problems (Environment Audit Committee, 2016). Most microplastic releases are unintentional and diffusive in nature, and it is, therefore, difficult to prescribe an immediate remedy, but microbeads in PCCPs are intentionally added and thus easy to remove or ban (IUCN, 2017).

2.4   Contributing factors to microbead governance

There has not been much research on the contributing factors to governance and policy interventions against the use of microbeads: why countries are coming forward to eliminate the use of microbeads. Although a few countries have already passed legislation to ban microbead containing PCCPs, there remains uncertainty as to the implementation and enforcement of the bans, due to the lack of study quantifying the effectiveness of these policies (Xanthos & Walker, 2017). Policy design and implementation regarding microplastics could be specially challenging for countries with weak environmental governance and institutional capacity (Dauvergne, 2018; Girard et al., 2016). In addition, there is a global policy vacuum that can address the microbead problem across the globe, and due to its transboundary nature, even one country failing to restrict the microbead release to the environment is highly likely to exacerbate an already severe condition of the aquatic ecosystem (Graney, 2016; Guerranti et al., 2019).

Dauvergne (2018), nevertheless, argues that the environmental norm against the use of plastic microbeads in PCCPs has been gaining strength for several reasons: *growing scientific evidence of harm*, *strong network of anti-microbead activism*, *rising public concern against plastic waste*, *early legislative ban in powerful markets*, and *relatively weak political and corporate resistance*. To begin with, scientific concern against the use of plastic microbeads has been raised already in 1990s (Zitko & Hanlon, 1991; Gregory, 1996), and the volume of research articles on microbeads and microplastic pollution has substantially grown in 2010s (Anderson, Park, & Palace, 2016; Dauvergne, 2018). Researchers, by 2015, found significant volume of microbeads in five Great Lakes of North America (Eriksen et al., 2013; Driedger et al., 2015). More and more research findings across the globe subsequently consolidated the evidence of harm of microbeads to the ecosystem, and eventually to humans (Smith et al., 2018; Wright & Kelly, 2017; Sharma & Chatterjee, 2017). In addition, researchers, including Marcus Eriksen of the 5 Gyres Institute, contributed significantly to the anti-microbead activism by publicizing their research findings in social media, drawing attention of general public, governments and inter-governmental agencies, like UNEP, against the harmful use of microbeads in PCCPs, and thereby putting pressure on corporations for phasing out their microbead-containing products (Dauvergne, 2018).

This compelling evidence of harm and research-lobbying gave rise to an anti-microbead norm (Dauvergne, 2018). At the fore of this activism was 5 Gyres Institute, founded in 2009 by Anna Cummins and Marcus Eriksen, who later led the research team to investigate microplastic pollution in Great Lakes. This institute has subsequently played a leading role in spreading the anti-microbead norm by collaborating with scientists across the globe and also lobbying Obama administration to pass Microbead-Free Waters Act of 2015 (Dauvergne, 2018). Another key role in disseminating anti-microbead norm has been played by the Dutch Plastic Soup Foundation, founded in 2011. A year later the Foundation launched the 'Beat the Microbead' campaign, partnering with many NGOs mostly from the developed countries, e.g. 5 Gyres Institute from the USA, but also the developing countries, e.g. ESDO from Bangladesh and IOI from South Africa. This network gave them enormous power, which is evident from the words of Stiv Wilson of 5 Gyres Institute (DuFault, 2014).

> *P&G brushed us off, and we bombed them with 15,000 letters and absolutely shut down their email communications at the VP level for several days. Finally, they sent one email that said they'd discontinue using beads by the end of 2017. […] That was in June, 2013.*

The coalition of NGOs targeted the lack of transparency and information governance around microplastics pollution by engaging with companies and educating consumers (Meier, 2017). In due course this campaign has been very successful in creating public voice and making top transnational corporations declare phasing out the use of plastic microbeads from their respective products. In retrospect, Marcus Eriksen (2017) claimed that environmental coalitions with a shared goal exerting "constant pressure over time" are too powerful to fail.

TABLE 1   Timeline of important events regarding microbead pollution and policy actions worldwide (adapted from Meier, 2017; Dauvergne; 2018; Beat the Microbead, 2019a)

1976
- Norwegian chemist, John Ugelstad first made plastic microbeads, which later had successful application in HIV/cancer research

1990s and early 2000s
- Microbead use in PCCPs gained popularity
- Zitko and Hanlon (1991) raised environmental concern
- Gregory (1996) pointed at risks to ecosystems
- Studies found evidence of microplastics in marine environment (e.g. Derraik, 2002; Thompson et al., 2004)

Late 2000s
- Anna Cummins and Marcus Eriksen found 'plastic soup' in North Pacific Gyre in 2008
- In 2009, Anna and Marcus founded 5 Gyres Institute, which subsequently played a key role in disseminating antimicrobead norm

Early 2010s
- Eriksen and 5 Gyres Institute collaborated with scientists globally
- The Dutch Plastic Soup Foundation was founded in 2011
- In 2012, the Foundation launched 'Beat the Microbead' campaign, forming a network of NGOs from around the globe, including 5 Gyres Institute
- Many MNCs, like Unilever, J&J, P&G, promised voluntary phase-outs
- Illinois banned microbeads in 2014, following Eriksen et al. (2013) report
- Microbead containing PCCPs are not allowed to use Ecolabel since 2014

Mid 2010s
- US passed Microbead-Free Waters Act of 2015
- UNEP publishes scientific report called Plastics in Cosmetics in 2015
- Canada listed microbeads as toxic substance and banned its use in toiletries products in 2016
- Other governments, like UK, France, New Zealand, Taiwan and India, subsequently passed legislation against microbead use in PCCPs
- Accord Australasia launcehd voluntary BeadRecede Programme in 2017
- The European Parliament has embraced the environment commission's report in 2018 that advocates a ban on intentionally added microplastics in cosmetics

The Campaign, observing companies' narrow definitions of microplastics in their voluntary phase-out declarations and legislative loopholes, subsequently demanded governments to pass "legislation banning all microplastics in cosmetics in all countries, using this simple and clear definition: any plastic ingredient of 5 mm or less" and businesses "to publicly announce that their products are 100% free of microplastics"(Beat the Microbead, 2019b). The Campaign offers the 'Look For The Zero' logo for companies and brands willing to gain competitive advantage by declaring their products to be free of microplastic ingredients, an app

that allows consumers to check if a personal care product contains microplastic ingredients; and a website with product lists that allows consumers to check if a product contains microplastic ingredients (Beat the Microbead, 2019b). Local campaigns, on the other hand, also exerted similar pressure; for example, UK-based Fauna & Flora International (FFI) prepared 'Good Scrub Guide' document and, together with Marine Conservation Society (MCS), ran 'Scrub It Out' campaign to tackle microbead pollution from PCCPs (Dauvergne, 2018). Interestingly, in the UK, while NGOs, like FFI and MCS, adopted constructive, positive and collaborative approach to engage with businesses, mainly SMEs, other NGOs, like Greenpeace, took the route of adversarial campaigning and naming and shaming strategy, mainly against MNCs (Meier, 2017).

In the face of growing activism, robust research evidence and heightened public awareness, several corporations, such as Unilever, Colgate-Palmolive, and Proctor & Gamble, sought to protect their green image and capture the new business opportunity, by voluntarily declaring phasing out plastic microbeads and manufacturing products with natural alternatives (Dauvergne, 2018).

> *Plastic scrub beads were previously contained in a limited number of beauty & personal care products, such as facial cleansers, soaps, shower gels and body washes. We used them because they can gently unblock pores and remove dead cells from the skin's surface. […] We stopped using plastic scrub beads in 2014 in response to concerns about the build-up of microplastics in oceans and lakes. […] We now use alternative exfoliating ingredients such as apricot kernels, cornmeal, ground pumice, silica and walnut shells. (Unilever, 2018)*

> *Colgate-Palmolive used microbeads in a limited number of oral care and personal care products to enhance aesthetics and aid in cleaning. However, some groups raised concerns regarding the potential contribution of microbeads to pollution of the world's oceans. Recognizing that consumers have questions, as of year-end 2014 we stopped using microbeads. (Colgate-Palmolive, 2018)*

Likewise, industry associations, e.g. Cosmetics Europe, Cosmetic Toiletry and Fragrance Association (Canada) and Accord Australasia, came forward and recommended its members to phase out microbead-use in their respective products.

> *In October 2015, Cosmetics Europe recommended to its members to discontinue, by 2020, the use of synthetic, solid, plastic particles (microbeads) used for exfoliating and cleansing, that are non-biodegradable in the aquatic environment. […] Many companies that previously used plastic microbeads are looking to replace them, or have already done so, with alternatives including those made from beeswax, rice bran wax, jojoba waxes, starches derived from corn, tapioca and carnauba, seaweed, silica, clay and other natural compounds. (Cosmetics Europe, 2018)*

Nevertheless, NGOs, like Greenpeace International, accused businesses for missing voluntary deadlines, exploiting legislative loopholes, using ambiguous labelling rules, and lobbying legislators to continue business as usual, or at least concede narrower restrictions, e.g. being allowed to use microbeads in leave-on

products and use biodegradable plastics (Park, 2016; Johnston, 2017; Rochman et al., 2015).

UNEP: Research, Campaign, Advocacy, Awareness, Guidance, Global environmental governance

- Funding research
- Passing laws and regulations
- Exerting pressure on businesses
- Cooperating with UNEP
- Conducting public consultation
- Partnering with stakeholders
- Promoting sustainable alternatives

- Conducting scientific research
- Publishing evidence of harm on the internet and social media
- Environmental activism
- Networking
- Research lobbying
- Awareness raising

Consumers: Exercise purchasing power, Petition, Demand accountability and transparency from governments and businesses

Governments

Research Network

Businesses

NGO coalition

- Lobbying government
- Exploiting legislative loopholes
- Voluntary phase-out
- Narrowing down the scope
- Missing deadlines
- Ambiguous labelling
- Benefitting from 'green image'
- Developing alternative arguments

- Campaign, petition
- Exerting pressure on businesses
- Naming and shaming
- Educating consumers
- Policy advocacy and lobbying
- Certification scheme, logo
- Propagating good practices
- Mobile application, website

FIGURE 4   Strategies and courses of action pursued by key political and policy actors regarding microbead pollution (adapted from Dauvergne, 2018; Meier, 2017)

Meanwhile, responding to enormous pressure from NGO groups and observing public outrage, regulatory actions at the state levels and research evidence against microbead-containing products, US federal government passed the Microbead-Free Waters Act in 2015, followed closely by Canada, which listed microbeads as toxic substance and banned the sale, import and production of microbead-containing PCCPs in 2016 (Xanthos & Walker, 2017). Legislative action in these two powerful economies and big markets sent a strong signal to the multinationals, in addition to setting examples for other countries, like the UK, France, Sweden, New Zealand, Taiwan, India and many others, to take anti-microbead legislative action (Dauvergne, 2018). Furthermore, international

organizations, such as UNEP, have been active in raising awareness against plastic pollution and in the process launched campaigns like Clean Seas Campaign for tackling marine plastic pollution. All these have contributed to the growing public sentiment and political will across the world to tackle microbead pollution.

2.5   Governance interventions for microbeads in PCCPs

Governance and policy interventions to reduce the use of microbeads in PCCPs across the globe have been rather limited and fragmented (Xanthos & Walker, 2017; Dauvergne, 2018). There have been two major control mechanisms adopted globally: product ban and voluntary agreements (UNEP, 2016). On the one hand, there is this legislative ban on cosmetics and toiletries products containing microbeads. According to 'Beat the Microbead' – an International Campaign against Microplastic Ingredients in Cosmetics led by Plastic Soup Foundation and supported by 100 NGOs in 42 countries – countries like the USA, Canada, the UK, France, Sweden, New Zealand, Taiwan and India have already passed legislation to ban PCCPs containing microbeads, and other countries are following suit (Beat the Microbead, 2019a). In addition, a few EU member states, namely the Netherlands, Sweden, Belgium and Austria, requested the European Commission to propose an EU-wide legislative ban on microbead use (Environment Council, 2014). In 2018, the European Parliament approved a report that welcomes the European Commission's proposal, whereby members of European Parliament contended that the use of intentionally added microplastics, including microbeads in PCCPs and cleaning products, be banned by 2020 (Guerranti et al., 2019).

On the other hand, a range of voluntary commitments, for phasing out the use of plastic microbeads, have been made by individual companies and industry associations. For example, Unilever claimed that it had completed the phase out of plastic microbeads by 2014, while both Proctor & Gamble and Johnson & Johnson committed to the voluntary phase-out by 2017 (Environment Audit Committee, 2016). As regards industry associations, Cosmetics Europe – the European trade association for the cosmetics and personal care industry – recommended its members to discontinue the use of microplastic particles by 2020 (Cosmetics Europe, 2015), while Accord Australasia – the national industry association representing manufacturers and suppliers of hygiene, cosmetic and specialty products in Australia – launched its BeadRecede initiative targeting both members and non-members to complete an industry-wide phase-out by 1 July 2018 (Accord, 2017).

Governance interventions aimed at tackling microbead pollution are still in their infancy, and only a handful of the countries, particularly in the Global North, have been pioneering in these endeavors (Xanthos & Walker, 2017). Among the developing countries, India passed a resolution in 2017 to ban the use of plastic microbeads in cosmetics products upon the directions from the National Green

Tribunal, while South Africa is considering a ban since microplastics have been found in tap water (Beat the Microbead, 2019a). It appears that developing countries are lagging far behind their industrial counterparts in tackling microplastic pollution. There is a strong likelihood that these countries with little/no regulation in place may become the dumping ground for microbead-containing products banned or removed from other countries with stricter regulation (Girard et al., 2016).

2.6   Why should Bangladesh be concerned?

With a large (over 160 m) population and a growing economy (7,1% in 2016) (World Bank Data, 2018), Bangladesh is an attractive and expanding market for beauty and personal care products, which are increasingly consumed by the elites, middle-class and lower middle-class people, driven by rising disposable income and western consumption trend (Euromonitor, 2019). Consequently, companies are also making constant efforts to make their products available, accessible and affordable to different customer segments. For example, many companies nowadays offer their products in plastic sachets (known as mini packs) to be accessed by lower-income communities both in urban and rural areas. To meet the growing demand, a lot of cosmetics and toiletries products are imported. In Bangladesh operate many multinational companies (namely Unilever, Proctor & Gamble, Johnson & Johnson and Reckitt & Benckiser) which are up against strong competition from local firms, such as Square Toiletries and Kohinoor Chemical among others, for capturing the thriving market. However, the environmental regulations and the waste management practices in Bangladesh are not well developed. Therefore, it is important to make sure that such a growing industry does not impose additional burden to the aquatic environment which has already been struggling with existing contaminations.

Geographically, Bangladesh is a low-lying riverine country. Three major rivers, namely the Padma (Ganges), the Jamuna (Brahmaputra) and the Meghna, and their tributaries make up the Ganges Delta, forming almost 80% of the landmass of the country. Most of the rivers are transboundary with origins in India or China and destination to the Bay of Bengal, which is a unique habitat known for its flora, fauna and biological diversity. Understandably, Bangladesh stays at the receiving end for transboundary movement of numerous pollutants. Besides, 60% of Bangladeshi people (almost 100 million) depend mainly on fish for their animal protein intake and more than 17 million people including 1,4 million women depend on fisheries for their livelihood (Shamsuzzaman et al., 2017). Therefore, microplastic pollution and resulting disturbances in the ecosystem are likely to have ramifications for the country on ecological, social and economic dimensions.

Another point is that in India the authority passed a resolution to ban the use of microbeads in cosmetic products, and presumably, there could be a

legislative ban sometime soon. India is Bangladesh's closest neighbor and largest trading partner in South Asia. Moreover, India shares 4000-km long, porous border, and there is a remarkable volume of informal, and often illegal, trades between these two countries. Local residents, enforcement agencies and even large smuggling syndicates are involved in these transactions. In this case, if Bangladesh do not have the regulatory arrangement to control microbead pollution, it may become the dumping ground for the microbeads containing products of India.

Environment and Social Development Organization (ESDO) conducted an initial study to explore the actual level of microplastic pollution in three major cities, namely Dhaka, Chittagong and Sylhet, in Bangladesh (ESDO, 2016). This study included three different parts: fish sampling, market survey and survey on awareness level among people. The results showed that more than 60% of fish samples collected from the lakes and ponds of Dhaka city contained microplastics in their guts and respiratory tract. As regards the product samples collected from the markets in Dhaka, facewash came out top as to microbead release in the aquatic system, followed by detergent and toothpaste. Facewash brands, like 'Clean and Clear' and 'Neutrogena' owned by Johnson & Johnson, contained nearly 89% and 80% microbeads respectively. Interestingly, among the microbeads containing products were Surf Excel and Close-up, brands owned by Unilever, which had claimed to have phased out plastic microbeads already in 2014. Regarding public awareness about the microbead pollution, it turned out that a clear majority (95%) of the consumers were unaware of the harmful impact of the plastic particles. Similarly, 92% of the retailers admitted that they had no idea about microbead pollution.

In this context, it is crucial to know what other stakeholders, e.g. the manufacturers, importers, civil society groups, experts, and, more importantly, bureaucrats, think and know about microbead pollution: from the national context as well as international contexts. Since these people are very active and experienced with policy-making culture and context in Bangladesh, their opinion and views regarding an effective governance mechanism are deemed useful to make them aware and engaged in the fight against microbead pollution in Bangladesh. In particular, I would like to know their choice of policy instruments, preferred institutional arrangements for policy implementation and enforcement, and perceived barriers to initiate the policy change in Bangladesh. Finally, I would like to know the potential roles, individual or organizational, they can play in driving the policy change.

3 THEORETICAL FRAMEWORK

This chapter presents the theoretical background for this study from governance and policy literature. The first section seeks to describe how environmental governance is defined in the extant literature. The second section explicates from the literature why environmental governance is ambiguous and what the common complexities are in pursuing environmental governance. Section 3, thereafter, details why it is important to engage a variety of actors in environmental governance and environmental decision making, and to understand their perceptions about the problem and courses of action. On that note, very relevant topics to cover are policy-making process and the choice of policy instruments, which are briefly discussed in the following two sections. This is followed by a compilation of various factors affecting policy-making processes and outcomes. The final section provides a visual presentation of the theoretical framework, preceded by a brief overview of environmental governance mechanism in Bangladesh.

3.1 Understanding environmental governance

Understanding environmental governance requires an understanding of how decisions regarding the environment are made, who makes those decisions and for whom, and whether adopted policies and processes can deliver sustainable outcomes (Bennett & Satterfield, 2018). Environmental governance is a subset of the broader governance literature (Armitage, de Loë & Plummer, 2012). Keohane and Nye (2010, p. 12), for example, defined the term 'governance' to be the "processes and institutions, both formal and informal, that guide and restrain the collective activities of a group". They argued that governance is primarily conducted by the governments, but can also be steered by private actors, their associations, third sector actors, their associations and the international organizations. Likewise, Lynn, Heinrich and Hill (2000) defined governance to be comprised of "structures and processes guiding administrative activity that create constraints and controls (both ex ante and ex post) and that confer or allow autonomy and discretion on the part of administrative actors, all toward fulfilling the purposes of the enacting coalition" (p. 239). Elliott (2004), however, argued that governance goes beyond 'institutional structures and processes' and embraces 'the norms, principles and political practices' in order to ensure informed decision-making and improved social and economic behaviour (p. 94). Governance, thus, may mean "formulating, promulgating, implementing and/or enforcing societally relevant rules (binding or voluntary ones) by government, business and/or societal actors, whereby the rules can apply to others or to themselves" (Steurer, 2013, p. 388).

The term 'environmental governance' is defined similarly in the literature, with an added dimension for the environment. In its simplicity, environmental

governance refers to 'the rules, policies and institutions' governing human interaction with the environment (UNEP, 2018). Likewise, Lemos and Agrawal (2006, p. 299) defined environmental governance to be a "set of regulatory processes, mechanisms and organizations through which political actors influence environmental actions and outcomes". On that note of political actors, Paavola (2007, p. 94) defined environmental governance as "the establishment, reaffirmation or change of institutions' to resolve conflicts (of interests) over environmental resources". Political actors, including state actors and non-state actors, e.g. market actors, civil society-based actors and local communities, have their stakes in various interventions, such as international treaties, national policies and legislation, local decision-making structures and transnational institutions, which are designed to effect changes in environmental incentives, knowledge, institutions, decision-making and behaviours (Lemos & Agrawal, 2006).

Bennett and Satterfield (2018) sought to develop a comprehensive and practical framework for environmental governance. Their framework consists of various elements of environmental governance, such as institutions, structures and processes, with an additional dimension of governance objectives and attributes. They identify four fundamental objectives of environmental governance: "(1) effective governance supports the maintenance of system integrity and functioning; (2) equitable governance employs inclusive processes and produces fair outcomes; (3) responsive governance enables adaptation to diverse contexts and changing conditions; and (4) robust governance ensures that functioning institutions persist, maintain performance, and cope with perturbations and crises" (p. 7). As regards elements of environmental governance, the first set, according to Bennett and Satterfield (2018), comprises institutions, which are defined as formal and informal rules shaping human interactions and that guide, support or constrain human or management action. Formal rules include constitutions, laws, regulations and policies, whereas informal rules involve social norms, cultural context and prevailing power structures. The second set of elements refers to structures, which includes formal bodies (e.g. decision-making arrangements) and organizations (such as public, private and third sector organizations), but also informal networks of actors and organizations that perform various functions enabling governance capacity. Finally, the third set of governance elements refers to governance processes, through which governance functions and performance are realized. These include proper articulation of institutional mandates, negotiation of values, diffusion of information, resolution of conflicts and formulation of policies.
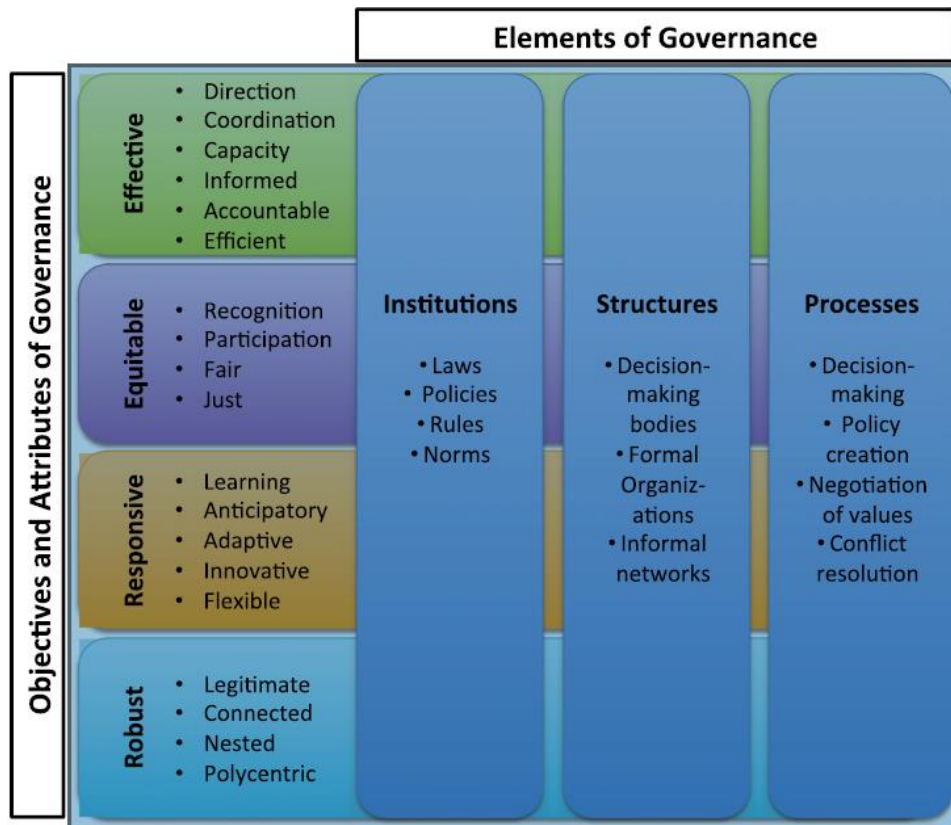
FIGURE 5   Objectives, attributes and elements of environmental governance (Bennett & Satterfield, 2018, p. 8)

For the purpose of this study, I use this framework to understand different elements of environmental governance. The following section seeks to explain why the term governance is ambiguous, and what complexities involve in governing environmental problems.

3.2   Ambiguity and complexity in environmental governance

As is described in the previous section, the term 'governance' may take different meanings to different people in different contexts. It typically refers to the formal and informal processes and institutions that guide and regulate collective activities of a group (Keohane & Nye, 2010). Governance involves diverse actors in the society with their own sets of problems, interests, goals and strategies, and, thus, requires processes by which "collective problems are defined and analysed", "goals and assessments of solutions are formulated" and "action strategies are coordinated" (Voss & Kemp, 2006, p. 9). The notion of governance gained popularity in 1980s in the discourse of development studies and subsequently in other domains, such as international relations, political science, policy science, environmental studies and risk research (Renn, Klinke, & van Asselt, 2011). Governments and the public agents have historically been regarded as the key actors in

governance, but over the course of time their dominant role eroded from 'Governance by government' (i.e. public regulation), 'Governance with government' (i.e. co-regulation) to 'governance without government' (i.e. private self-regulation) (Steurer, 2013). This is a gradual shift from hierarchical and institutionalized forms of governance, dominated by state agencies and departments, to less formalized forms of governance, whereby power is distributed between various actors and organizations, such as state, private sector and civil society groups (Arts, Leroy, & van Tatenhove, 2006).

Scholars, particularly political scientists, associate governance with the upsurge of markets and networks alongside bureaucratic hierarchies and argue that "contemporary states govern in and through increasingly complex organizational forms, including markets, public-private partnerships, policy networks, and transnational groups" (Bevir, 2013, p. 149). This shift in governance has taken place in response to emerging challenges, such as increased globalization, international cooperation, emergence of civil society organizations, growing public awareness, changing market structure, increasing complexity of policy issues and the resulting complications in making decisions with confidence and legitimacy (Renn et al., 2011; Walls, O'Riordan, Horlick-Jones, & Niewöhner, 2005). Governance is also ambiguous and complex in terms of philosophical stance: i.e. for an optimist it may refer to 'instrumental efforts to solve societal problems', for a realist it may mean 'interactions between dependent actors in the institutional environment', whereas a pessimist may consider it as 'power play of actors in a locked-in society' (Biesbroek et al., 2014, p. 1014).

The complexity of governance increases considerably when it comes to environmental issues. Richards, Blackstock and Carter (2004, p. 4) argued that "Most environmental problems are complex, uncertain, extend over large spatial and temporal scales and may be irreversible". To begin with, environmental problems are often transboundary in nature (Berg & Lidskog, 2018; Doyle et al., 2016). The effects of many environmental issues may cut across spatial and temporal borders (Lidskog, Uggla, & Soneryd, 2011), since human actions can trigger various forms of environmental degradation that can manifest themselves way beyond geo-political boundaries and one human generation (Underdal, 2010). Another form of complexity regarding environmental governance results from the uncertainties and contestations of the knowledge claims (Irwin & Michael, 2003; Beck, 2009). Likewise, the environmental values and the significance of nature and environmental resources do vary across cultures and political domains (Vatn, 2018). Moreover, environmental problems are often silenced in many parts of the world in the face of more urgent needs, e.g. economic development and political security, perceived by the concerned decision makers (Trombetta, 2008). Furthermore, nonlinear dynamics, threshold effects, cascading consequences and limited predictability of environmental change across the world have made the issue of environmental governance very complex (Duit & Galaz, 2008). On a different note, Doyle et al. (2016, p. 220) referring to shifting power dynamics argued that "[t]hree decades of neoliberalism and the rise of powerful global institutions have resulted in significant changes in the way of environmental problems are

created, framed and managed". With the increasing power of the financial institutions and transnational corporations, on the one hand, and social networks of civil society groups and activism, on the other, have made environmental issues and their governance very contentious.

The following section seeks to explain why it is important to engage a wide variety of stakeholders in environmental governance and why understanding their perceptions of the environmental problem and views on the governance mechanism makes sense.

3.3   Stakeholder perceptions and engagement in policy action

To deal with complex issues in environmental governance, many scholars have called for creation, mobilization and utilization of knowledge (van der Molen, 2018; Giebels, van Buuren, & Edelenbos, 2013). Lemos (2015, p. 48), in particular, observed that "emerging governance approaches […] actively involve communities and stakeholders; and incorporate all kinds of knowledge to inform decision making". The benefits of stakeholder participation in environmental decision making can be grouped in two broad categories: normative and pragmatic (Reed, 2008). Normative benefits of stakeholder participation could be increase in public trust in political decision making (Richards et al., 2004). However, this requires the provision of stakeholder perception regarding the participation processes to be transparent and accommodating conflicting views and claims. Secondly, coproduction of knowledge in a participatory process by a wide variety of actors, such as experts, policymakers, and other stakeholders, is likely to enhance the capacity of the participants to use the knowledge cogenerated (van der Molen, 2018; Taylor & de Loë, 2012; Lemos, 2015; Giebels et al., 2013). Another normative argument is that participatory approach in environmental decision making and generation of knowledge is also associated with social learning (Ernst, 2019; Armitage et al., 2011; Berkes, 2009).

Pragmatic benefits of stakeholder engagement in environmental decision making, on the other hand, include the possibility to enhance the quality and durability of the decisions (Reed, 2008). For example, finding common ground, developing trust among participants and learning to appreciate the legitimacy of each other's perspectives through the participatory processes can change adversarial relationships into cooperative and collaborative ones (Stringer et al., 2006). Participation is also likely to result in higher quality decisions by providing more complete information as well as tackling potential risks and adversities beforehand (Fischer, 2000; Newig, 2007). Similarly, research results are likely to be of better quality through greater participatory inputs (Reed, Fraser, & Dougill, 2006). Stakeholder engagement also enables interventions and technologies to be better suited to the local socio-cultural and environmental conditions and are likely to be adopted and diffused at a greater scale to target groups (Martin & Sherington, 1997; Reed, 2007). Moreover, collaborative forms of decision making create a

sense of ownership on the processes and outcomes, which are likely to secure enduring support from the collaborators and active implementation of the decisions (Richards et al., 2004). Finally, cocreation of knowledge, values and social order by engaging a wide variety of stakeholder groups can significantly improve governance capacity in three dimensions: regulatory (setting goals, vision, limit), adaptive (willingness to adapt, revise decisions) and integrative (incorporating diverging values) (van der Molen, 2018).

On that note, engaging stakeholders in the participatory process and collaboratively making environmental decisions require better understanding of their perceptions of the environmental issue, their respective goals and favoured strategies to deal with it. Comprehending stakeholder perceptions can perform a key function in understanding and influencing their behaviors (Ajzen, 1991) and soliciting stakeholders' support (Gurney, et al. 2015). Since people approach an environmental issue with different levels of experience and understanding, different concerns and motivations and different perspectives on the actions required to facilitate solutions, it is crucial to understand the perceptions of various stakeholder groups in order to communicate effectively, target outreach and engagement practices and influence behavioural change (Hartley et al., 2015). Research carried out by psychologists and other social scientists suggests that to perform a certain action, individuals need to perceive the complexity of the issue, feel concerned, responsible, motivated and capable for taking action, and perceive others are also pursuing a similar goal (Gifford, 2014). Theories of pro-environmental behaviour suggest that if people are aware and concerned of an environmental problem, they are more likely to appreciate the need for pro-environmental action and actually engage in that action, but if they find themselves unable to help due to some practicalities, adversities and perceived barriers, they may become overwhelmed, but their environmental concern may not be translated into action (Blake, 1999; Ajzen 1991; Kollmuss & Agyeman, 2002).

Therefore, it is crucial for the success of the environmental policy and governance to understand how various actors perceive the environmental issue, who they think should solve the problem, what their objectives and interests are, what policy instruments they favour and find effective, and what challenges they foresee in the policy-making and implementation process.

3.4 Policy-making process and drivers of policy change

Making policy is at best a very rough process. Neither social scientists, nor politicians, nor public administrators yet know enough about the social world to avoid repeated error in predicting the consequences of policy moves. A wise policy-maker consequently expects that his policies will achieve only part of what he hopes and at the same time will produce unanticipated consequences he would have preferred to avoid. If he proceeds through a succession of incremental changes, he avoids serious lasting mistakes. (Lindblom, 1959, p. 86)

To understand policy-making process, the policy-cycle approach has been regarded as the most enduring conceptual construct (Weible, Heikkila, deLeon, & Sabatier, 2012), owing to its clear-cut and ordered stages easily conceivable by the policy practitioners (Cairney, 2015). According to this model, the process of policy-making can be thought of a series of interrelated steps, often placed in a cyclical model, which was first systematically developed by Harold Lasswell in the early 1950s (Howlett & Giest, 2015). Even though the process of policy-making in reality can be chaotic and unpredictable, policy cycle model still gives a simplified structure to attempt policy analysis (Cairney, 2015). Despite having many variations in names and numbers of the steps involved, the most commonly used model describes a 5-stage policy process: agenda setting, policy formulation, Decision making, policy implementation and policy evaluation (Howlett & Giest, 2015; Jann & Wegrich, 2007).

FIGURE 6   Policy cycle (adapted from Howlett & Giest, 2015)

According to Howlett and Giest (2015), agenda setting, the first stage in the cycle, refers to the policy phase when the existence of a societal problem is sensed by various actors and a variety of solutions are put forward to deal with it. Cobb and Elder (1972, p. 85) drawing distinction between public agenda and institutional agenda argued that the former "consists of all issues that are commonly perceived by members of the political community as meriting public attention and as involving matters within the legitimate jurisdiction of existing governmental authority", whereas the latter comprises only a few issues to which policy elites decide to pay their attention (Kingdon, 1984). Jann and Wegrich (2007, p. 46) identified that the "crucial step in this process of agenda-setting is the move of an issue from its recognition—frequently expressed by interested groups or affected actors—up to the formal political agenda".

The second step of the policy cycle is policy formulation, which refers to the development of specific policy options within the government when the options are narrowed down, excluding the ones deemed infeasible (Howlett & Giest, 2015). It is during this phase, when expressed problems, proposals and demands are taken into government's programs, and state agencies along with relevant actors with useful knowledge contribute to framing the policy objectives and plausible action alternatives (Jann & Wegrich, 2007). Haas (1992) identified the role of epistemic communities and policy communities, in the form of loose groupings of experts, serving as knowledge providers to decision makers in policy formulation.

Decision making refers to the third stage whereby decision makers come to a logical and efficient conclusion regarding a policy, ideally, following a systematic method (Howlett & Giest, 2015). Having said so, the reality is not always rational and "political processes of bargaining and negotiation often outweigh 'rational' deliberations and calculations of costs and benefits in public policy decision making" (Howlett & Giest, 2015, p. 290). The decision-making process is often affected by a number of factors: e.g. what kind of agents are involved in a decision, what is the decision setting, how well the problem is defined, what types of information are available, and how much time is allocated for the decision and what are the existing and anticipated consequences of the decision made (Forester, 1984).

The fourth stage of the policy-making process is policy implementation, which refers to the phase when decision made comes into effect using policy instrument(s) or a combination thereof (Howlett & Giest, 2015). Generally speaking, policy implementation refers to "what happens between the establishment of an apparent intention on the part of the government to do something, or to stop doing something, and the ultimate impact in the world of action" (O'Toole, 2000, p. 266). Jann and Wegrich (2007, p. 52) prescribed that ideally a policy implementation process should include "1) specification of program details (i.e., how and by which agencies/organizations should the program be executed? How should the law/program be interpreted?); 2) allocation of resources (i.e., how are budgets distributed? Which personnel will execute the program? Which units of an organization will be in charge for the execution?); and 3) decisions (i.e., how will decisions of single cases be carried out?)". However, in the real world, policy implementation can be considerably impeded by certain factors, such as incomplete specification of or conflicts among policy objectives, inappropriate agency for implementation, incentive failures, lack of competence of implementing agency, lack of resources, limited technical and instrumental capacity, knowledge gap, communication failure or other overarching social, political or economic factors (Howes et al., 2017).

The fifth and final stage of the policy-making process is policy evaluation, which refers to the phase when state- and non-state actors monitor and evaluate the policy outcome with regard to the policy objectives that could lead to redefinition of the problem, reformulation of the solutions and repetition of the

policy stages (Howlett & Giest, 2015), or even termination of the policy, if the problem is deemed to be solved, policy measures appear to be ineffective in solving the problem or policy implementation is virtually impossible in real world context (Jann & Wegrich, 2007). Nevertheless, some fundamental problems with policy evaluation could include: evaluator's bias (based on the position, interest and values of the evaluator), lack of specified and measurable policy objectives and outputs based on which performance and outcome could be measured, and a combination thereof as sometimes public agencies to avoid blames for policy failure intentionally leave the objectives unclear and ambiguous (Jann & Wegrich, 2007).

A significant theory of policy-making process is Kingdon's multiple stream theory (MST), which primarily focuses on the agenda-setting stage of the policy cycle (Kingdon, 1984). The key message of this theory is that radical policy change takes place only in the condition that a window of opportunity opens and three independent streams, namely problem stream, policy stream and politics stream, converge and intersect. The first stream is known as problem stream, which captures the perceptions, opinions and attitudes of public and policy community towards a problem, whether they view this problem to be significant enough to require government intervention, and also their perception of the outcome of the possible intervention (Mukherjee & Howlett, 2015). The policy stream, on the other hand, captures the recommendations of the experts, policy analysts, advocates and others in the policy community regarding the problem and its solution (Voss & Simons, 2014). Finally, politics stream captures the contextual attributes, such as national mood and power shift during important events, e.g. elections and cabinet shuffles, when executive and legislative bodies turn over. This is the stream that dictates whether policymakers would pay attention to the problem and be receptive to the proposed solution. Therefore, according to this theory, radical policy changes take place when a problem gets enough attention, and plausible policy solution is available, and policymakers find the intervention timely and convincing.

Two other significant theories in policy science are advocacy coalition framework (ACF), developed by Sabatier and Jenkins-Smith (1999), and punctuated equilibrium theory (PET), developed by True, Jones and Baumgartner (1999). The former suggests that policy making is characterized by the interaction of advocacy coalitions within a policy subsystem. The choices and actions of the advocacy coalitions are guided by their belief system, which contains several layers, and outside factors can influence the outer layers (excluding the core beliefs), realign the beliefs and thus drive change. The latter, on the other hand, suggests that policy-making is characterized by long periods of incremental change punctuated by brief periods of major policy change. According to this theory, salience of an issue depends on the context. Policy entrepreneurs and interest groups can play a role in shaping policy image and public mobilization.

Building on the above theories, different types of external and internal factors, including the beliefs and actions of policy and political actors, advocacy

coalitions, policy entrepreneurs, significant events and the broader context, play their parts in bringing salience to the issue, finding acceptable policy solutions, and thus mobilizing public will and political will, leading to policy change. The following section seeks to describe what policy instruments or governing tools policy actors use to reach policy objectives, and what their key characteristics are.

3.5 Policy instruments and their choice

Policy design is then about understanding the nature of the problem faced by governments, the supply of governing resources available to deal with it and the capabilities and requisites, or 'character' of different instruments which can be deployed to affect it (Howlett, 2018, p. 248).

Environmental policy instruments, also known as governing instruments or tools, refer to measures taken by political actors, especially the governments, to address environmental problems, such as pollution and the depletion of natural resources, in addition to accomplishing environmental governance (Mickwitz, 2003). These instruments were initially grouped into command-and-control instruments and market-based instruments (Lindeneg, 1992), but in the course of time environmental governance practices have changed considerably, and newer types of instruments such as information means and voluntary agreements, have come into existence and resulted in good governance outcomes (Liao, 2018). One of the prolific producers and users of environmental policy instruments is the European Union, which sets a wide variety of policy instruments, such as 1) legislative and regulatory instruments (e.g. environmental treaty, resolution, regulation), 2) economic and fiscal instrument (e.g. fiscal incentives, pollution charges, public subsidies), 3) agreement-based and incentive-based instruments (e.g. voluntary agreements, monitoring network, codes of conduct) 4) Information- and communication-based instruments (e.g. labelling, information network, mapping), and 5) de facto and de jure/best practice (standards, best available technology/BAT, environmental impact assessment/EIA), for its member states (Halpern, 2010). Environmental instruments can also be grouped based on how legally binding they are and how direct the intervention is. FIGURE 7 gives a good illustration of these instruments in the form of a matrix (Brennholt, Hess, & Reifferscheid, 2018).

Despite having so many types of instruments, researchers, including Opschoor et al. (1994) and Vedung (1998), divided environmental policy instruments into three general categories: regulatory or command-and-control type, economic or market-driven, and persuasive or information instruments. The first category refers to those instruments, e.g. relevant laws, regulations, and standards, which are applied by the state authorities to control the production process or the products by prohibiting or limiting the number of certain pollutants or methods, and thereby ultimately influence the behaviour of the polluters (Bergquist et al., 2013). Since the intrinsic characteristics of command-and-control

instrument are being coercive and compulsory in nature, companies violating the requirements set by the state authority will be penalized by the law, and therefore are more likely to comply (Liao, 2018). To combat industrial pollution, most developed countries have long used command and control instruments, which are also common in emerging developing countries (Eskeland & Jimenez, 1992). However, command and control approach is often criticized for being relatively expensive and inefficient, mainly due to firm-regulator information asymmetry and lack of incentives for polluting firms to go beyond regulatory standards (Begquist et al., 2013). Typically, command and control instruments are less likely to succeed in "situations with many heterogenous polluters, a large informal sector, and week public administration" (Eskeland & Jimenez, 1992, p. 149).

The second set of policy instruments refers to economic, or market-based instruments, which are designed to internalize the externalities of environmental pollution, control and govern environmental pollution through market means, such as emissions trading, pollution charges, environmental taxes and environmental subsidies (Bergquist et al., 2013; Damon and Sterner, 2012). This type of instruments, by putting economic incentives, encourages firms to strive for environmental innovations and adopt more effective technologies and processes compensating the loss of margin incurred by the policy intervention (Hojnik & Ruzzier, 2016). Proponents of market-based instruments argue that these instruments are cheaper and more efficient, since the financial incentives typically "require the regulator to estimate only aggregate (rather than individual) costs of abatement to minimize the cost" (Eskeland & Jimenez, 1992, p. 149). For instance, if pollution tax is imposed by the government in a certain industry, a firm will compare the marginal cost of abatement and tax rate, and, based on the comparative benefit, either opt for pollution abatement or paying taxes. Nevertheless, market-based instruments are still relatively new, and there is a clear lack of well-designed instruments, the success of which depends largely on political feasibility and contextual nuances (Damon & Sterner, 2012).

The final set of instruments emerge from the notion of 'audience democracy' and is known as the information-based instruments, which are informal environmental regulations without mandatory enforcement requirements (Le Galès, 2010). These instruments involve specific type of information, such as information regarding corporate emissions of pollutants and the determination of environmental risks, required by the government from the businesses to make public (Lindeneg, 1992). For example, some scholars, like Halpern (2010), included labelling requirements like ingredients labelling on packaging, GMO labelling, or even other types of labelling, such as ecolabel, under this group. The key purpose is to make the information available to public and let them decide themselves, based on the information provided. The main objective of having information-based instrument is that the government, businesses, as well as the public voluntarily take part in policy implementation (Liao, 2018).
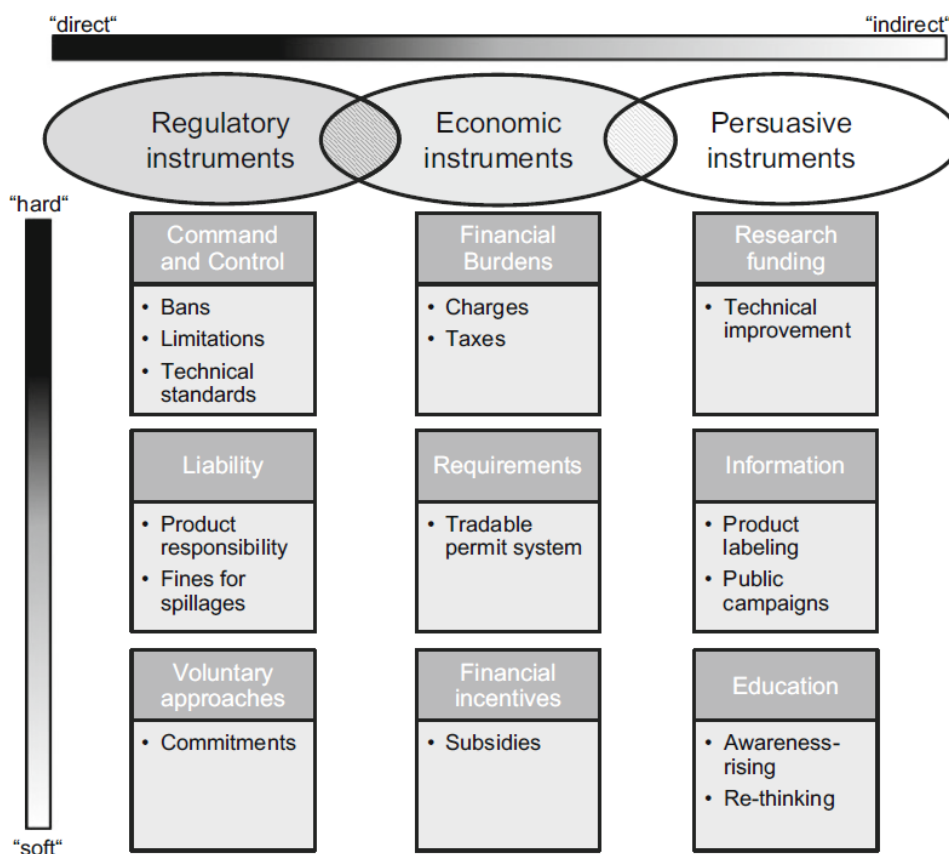
FIGURE 7   Types of environmental policy instruments (Brennholt et al., 2018, p. 239)

Knowledge about different stages of policy-making process and various types of instruments is useful for policy design. The next section, based on literature review, seeks to summarize the problematics in environmental policy-making, what factors affect the policy outcome, and why environmental policies fail.

3.6   Factors affecting policy-making process and policy outcome

There is a wide variety of factors that can affect the policy-making process and the success of policy outcome. To identify what the extant literature tells about these factors, I tried to look at the review articles that focus on various kinds of environmental policies adopted by national or local governments and categorize the barriers to successful policy-making. However, there is a clear lack of agreement regarding the categories in the literature, and, understably, the categories of the factors or barriers are often difficult to put under one single category as these are not always mutually exclusive. In such situations, I tried to use my own judgement based on the information and explanation provided in the papers. Two review papers that I found very useful in this regard are authored by Howes and his colleagues (2017), and Sippel and Jenssen (2010).

Based on their citations, I dived into the original articles to look at the issues more closely. Where possible, I tried to take developing country examples which are relevant to this study.

Howes et al. (2017) identified key factors affecting the intended outcome of environmental sustainability policy. They reviewed the literature to categorize the problematics that hinder the success of environmental policy endeavors. Altogether they reviewed 94 articles, detailing cause(s) of failure of, for example, a specific government policy, strategy or plan. Their categorization of the problematics have three layers: structural causes of failure, implementation traps and knowledge/scope issues. On the other hand, Sippel and Jenssen (2010) tried to categorize the drivers and barriers to policy-making from the perspective of local government. Nevertheless, for the purpose of my paper, it is sufficient to use the categorization from these review papers as proxy. TABLE 2 summarizers the barriers into ten different categories: economic, social, cultural, political, environmental, technical, institutional, legal, informational and discursive.

Economic factors, for example, often affect environmental poliy making and policy outcome. One such factor is market failure, resulting from the disconnection between economic market and environmental policy (e.g. Pastakia, 2002; Caviglia-Harris, Kahn, & Green, 2003; Seyfang, 2005). Pastakia (2002), for example, argued that the preference of market-led growth and development is still dominant in various parts of the world, espcially in developing countries like India, that cause environmental externalities in various stages in production and consumption cycles. This dominance of economic outcomes over environmental ones causes market failure, deterring the success of environmental policy. Likewise, Alshuwaikhat et al. (2007) giving the Bangladesh example showed the limitation of environmental impact assessment due to the favouring of economic outcome in assessing sustainability of development projects. The situation is particularly challenging for the least developed and developing countries in Asia and Africa. Liu (2012, p. 86) particularly mentioned 'Kuznets curve' and 'grow first, clean up later' attitude of the leaders of these developing countries, including China. Another factor that has a negative impact on environmental policy-making is budget constraints (Bai, 2007; Lankao, 2007; McCarney, 2009). McCarney (2009) while discussing cities' vulnerabilities to climate change risks mentioned that the viability of environmental projects and programs is often deterred by lack of financial resources and access to funding. Boadi and his colleagues (2005) also gave the example of municipal authorities in Africa and mention their difficulties in accessing funds and implementing environmental policies. Another significant drawback is the lack of use of economic instruments in achieving environmental outcome (Devkota, 1999; Soloviy & Cubbage, 2007; Liu, 2012). Soloviy and Cubbage (2007), for instance, in the context of Ukranian forest policy transition mentioned the need for more incentive-based instruments in order to prevent illegal harvesting and overexploitation of resources.

TABLE 2   Factors affecting the success of environmental policy (adapted from Howes et al., 2017; Sippel & Jenssen, 2010)

Category	Typical Barriers	References
Economic	Market failure	Pastakia, 2002; Calviglia-Harris et al., 2003; Seyfang, 2005
	Favoring economic outcome over environmental ones	Alshuwaikhat et al., 2007; Paker et al., 2013
	Impact of economic development on the environment	Beeson, 2010; Jabbour et al., 2012; Boadi et al., 2005
	Lack of market instruments and resistance from economic market	Devkota, 1999; Soloviy & Cubbage, 2007; Liu 2012
	Lack of economic incentives	Alshuwaikhat et al., 2007; Dutta et al., 2013; Egli & Steger, 2007
	Lack of resources	Romero & Lankano, 2007
	Budget constrains	Bai, 2007
	Costs vs economic benefits	Betsill, 2001; Harrison & Sundstrom, 2007
	Insufficient access to funding	McCarney, 2009
Social	Attitudes and beliefs of the public	Devkota, 1999; Baker & Baumgartl, 1998
	Social resistance to change	Devkota, 1999; Carter, 2013
	Characteristics and history of the target community	Pastakia, 2002; Seyfang, 2005; Soloviy & Cubbage, 2007
Cultural	Profit-maximizing mindset	Darier & Schüle, 1999
	Human inertia	Suzuki et al., 2010
Political	Policy not politically popular or go against prevailing political agenda	Rogers & Wilkinson, 2000; Jabbour et al., 2012, Buzar, 2008
	Influence of dominant interests on political feasibility	Rogers & Wilkinson, 2000; Parto, 2003
	Unstable political climate or corruption	Boadi et al., 2005 Paker et al., 2013; Buzar, 2008
	Environmental issues are highly politicized, thus contentious	Parto, 2003; Bartel & Barclay, 2011, Pelletier, 2010
	Difficulty in changing governance arrangements	Soloviy & Cubbage, 2007; Desrochers & Ikeda, 2003
	Failure to reach agreement	Jabbour et al., 2012; Ooi, 2009; Schuppert, 2011
	Short time horizon for political decision making	McEvoy, 2007; ESMAP, 2012
Environmental	Unstable or vulnerable environmental conditions	Aldy et al., 1998, Shiferaw et al., 2009
Institutional	Incomplete specification of policy goals	Devkota, 1999; Meehan & Bryde, 2011
	Inappropriate agencies for policy implementation	Devkota, 1999; Seyfang, 2005; Beeson, 2010
	Policies requiring multi-level or multi-sector approach	Soloviy & Cubbage, 2007; Jabbour et al., 2012; Siegel, 2013
	Chain of responsiblity for policy implementation not clear	Rogers & Wilkinson, 2000; Jabbour et al., 2012
	Conflicting policy objectives	Quesenberry, 2001; Beeson, 2010; Rogers & Wilkinson, 2000
	Lack of coherence between policies and objectives	Jabbour et al., 2012; Williams, 2005
	Lack of accountability or public demand	Soloviy & Cubbage, 2007; Jabbour et al., 2012; Williams, 2005
	Conflicting directives or orders of action	Paker et al., 2013; Ooi, 2009; Zhang & Liang, 2012
	Low levels of competence	Pastakia, 2002; Beeson, 2010; Alshuwaikhat et al., 2007
	Difficulties in transfer of policy or technology	Sheppard et al., 2011; Zhang & Liang, 2012; Shackleton et al., 2014
	Lack of dedicated time, funding and resources	Caviglia-Harris et al., 2003; Soloviy & Cubbage, 2007; Mittler, 1999
	Task requirements go beyond allocated resources	Jabbour et al., 2012; Paker et al., 2013
	Resistance and inertia within the administration	Bulkeley & Kern, 2006
	Lack of policy entrepreneurs or issue champions	Bulkeley & Kern, 2006
Technical	Availability of appropriate technology	Aldy et al., 1998; Caviglia-Harris et al., 2003; Chen & Liu, 2014
	Absence of applicable methodology	Dodman, 2009; Satterthwaite, 2008
Legal	Absence of appropriate laws	Von Zharen, 2010; Jabbour et al., 2012; Boadi et al., 2005
	Laws exist, but inadequate or not enforced	Dodman, 2009; Satterthwaite, 2008
	Lack of property rights	Aldy et al., 1998; Caviglia-Harris, 2003; Chidumayo & Gumbo, 2013
	Conflicting laws	Pastakia, 2002; Desrochers & Ikeda, 2003
Informational	Inadequacy or absence of consultation	Aldy et al., 1998; Rogers & Wilkinson, 2000; Alshuwaikhat et al., 2007
	Lack of community involvement	Quesenberry, 2001; Soloviy & Cubbage, 2007;
	Lack of community awareness or knowledge	Pastakia, 2002; Caviglia-Harris, 2003; Seyfang, 2005
	Lack of research	Sheppard et al., 2011; Buzar, 2008; Redclift, 2009
	Misconceptions about the cause	Jabbour et al., 2012; Liu, 2012; Siegel, 2013
	Low levels of understanding about the policy impact	Alshuwaikhat et al., 2007; Brand & Fischer, 2013; Schuppert, 2011
	Lack of comprehensive policies	Devkota, 1999; Sheppard et al., 2011; Brand & Fischer, 2013
	Lack of evaluation and evaluaton mechanism	Devkota, 1999; Soloviy & Cubbage, 2007; Baker & Baumgartl, 1998
Discursive	Clash between economic rationalism and environmentalism	Lux, 2003; Wright & Nyberg, 2014; Carter, 2013
	Framing of discussion and differences in language between groups	Jabbour et al., 2012; Bromley, 2007; Griffin, 2009

Political factors also play a huge part in affecting environmental policy-making and policy outcome. Environmental policy can, for some reasons, be politically unpopular or go against prevailing political agenda (Rogers & Wilkinson, 2000; Jabbour et al., 2012; Buzar, 2008). Buzar (2008), for instance, attributed Western Balkan's energy and environmental problems to the lack of political will to promote renewable energy and energy efficient technologies. Dominant industries in developing countries often have substantial influence on the government and thus make it hard to adopt environmental policies that go against their interest (Wright & Nyberg, 2014). Unstable political climate and corruption in developing and least developed countries also severely hinder

environmental policy-making and implementation (Boadi et al., 2005). In addition, short-time scale for political decision-making can also be a challenge for tackling long-term environmental problems (Sippel & Jenssen, 2010). ESMAP report (2012), for example, mentioned election cycles and the possibility of regime change to be a significant barrier to environmental policy-making. Another political stumbling block could be the difficulty to reach agreement across political domains with competing interests (Jabbour et al., 2012; Ooi, 2009, Schuppert, 2011).

Social and cultural factors often play a deterring role to the success of environmental policy-making (Pastakia, 2002; Seyfang, 2005; Soloviy & Cubbage, 2007). Soloviy and Cubbage (2007), for example, demonstrated that social characteristics and history of Ukranian people under the communist regime played a considerable role in impacting the forest policy and implementing international agreements during the post-communist era. Suzuki et al. (2010) discussing about ecological cities argued that people including professionals have a natural tendency to resist change that they term human inertia, which could affect any sustainability policy change. Similarly, Devkota (1999) gave the Nepalese example of forest resource management to show how this type of policy may fail due to the exclusion of certain social groups from the policy coverage. In addition, lack of policy entrepreneurs or issue champions can hinder the policy initiation and diffussion in the society (Bulkeley & Kern, 2006).

Lack of technical capacity often limit the effectiveness of certain environmental policy. Availability of appropriate technology can determine the viability of environmental policy (Aldy et al., 1998; Caviglia-Harris et al., 2003; Chen & Liu, 2014). Aldy and his colleagues (1998) gave the example of agricultural sector and argue that due to the undersupply of sustainable technologies, this sector under increasing demand is forced to increase productivity at the expense of environment. Similarly, Chen and Liu (2014) argued that due to technical limitation, companies in China are struggling to respond to the call for design for recycling. Also, on a slightly different note, technical capacity is also important for monitoring, testing and data management. Dodman (2009), for example, pointed at the complexity of collecting and comparing emission data, which inhibits municipalities from achieving environmental policy objectives.

On a similar note, lack of institutional capacity can also be a significant barrier. For example, lack of appropriate legal framework can significantly undermine any environmental policy (Quesenberry, 2001; Jabbour et al., 2012; Boadi et al., 2005). Von Zharen (1999), for example, referred to the inadequacy and fragmentation of legal framework to protect marine species across the globe. Similarly, Boadi et al. (2005) claimed that most African countries do not have any specific regulation to control industrial activities. Nevertheless, even if in developing countries, like Nepal, there might be existence of some environmental laws, but their implementation and enforcement are really poor (Devkota, 1999).

This brings us to the whole set of implementation traps. Incomplete specification of policy goals or conflicting policy objectives often result in

environmental policy failure (Devkota, 1999; Seyfang, 2005; Rogers & Wilkinson, 2000). Seyfang (2005), for example, discussed about the vagueness in policy objectives regarding sustainable consumption and identifies the difficulties in measuring the objectives due to the ambiguity. Rogers and Wilkinson (2000) demonstrated that conflicting policy objectives, such as social wellbeing (job creation and retention) and environmental protection (tackling resource depletion) as in the case of Canadian fishery, can lead to policy failure. Lack of coordination in policy implementation may result in failure. This can result from inappropriate agency implementing the policy (Devkota, 1999; Seyfang, 2005; Beeson, 2010), policies requiring multi-level or multi-sector approach (Soloviy & Cubbage, 2007; Jabbour et al., 2012; Siegel, 2013) or unspecified chain of responsibility for policy implementation (Rogers & Wilkinson, 2000; Jabbour et al., 2012). As was explained in Suzuki's (2010) example, human inertia, or resistance to change, applies also to people, who are involved in policy implementation. In addition, lack of resources, such as time, knowledge, competence and money, at the administrative level can result in policy failure, particularly in developing countries (Pastakia, 2002; Beeson, 2010; Alshuwaikhat et al., 2007). Alshuwaikhat et al. (2007), for example, mentioned the resource constraints and a lack of competence of environmental and regulatory agencies in Bangladesh in conducting environmental impact assessments, which in turn affect the implementation of environmental policy.

These bring us to informational barriers. Lack of research, stakeholder engagement and expert consultation may lead to inappropriate understanding of the problem at hand and inadequate environmental policy (Alshuwaikhat et al., 2007; Brand & Fischer, 2013; Schuppert, 2011; Jabbour et al., 2012; Liu, 2012; Siegel, 2013). Moreover, absence or inadequacy of evaluation may affect the legitimacy and effectiveness of environmental policy (Devkota, 1999; Soloviy & Cubbage, 2007; Baker & Baumgartl, 1998). Likewise, environmental policies often fail to achieve their objectives due to discursive factors (Brand & Fischer, 2013; Bromley, 2007; Griffin, 2009). Griffin (2009), for instance, nicely put forward the knowledge claims and contestation between EU policymakers and local fishery stakeholders reshaping the fishery discourse. Brand and Fischer (2013), on the other hand, referred to technophile-technosceptic dichotomy of environmental discourse and advocated for greater understanding, flexibility and practical solutions that would bridge the gap across the science-policy interface.

Overall, it is clear from the above discussion that the categories of the barriers and influencing factors are not mutually exclusive. Every category includes a variety of barriers and, similarly, a barrier can fall under multiple categories, based on individual perspectives. Nevertheless, this type of categorization provides a simplified framework to analyze environmental policy and identify potential risks and scopes for improvement.

3.7   Environmental governance mechanism in Bangladesh

The Ministry of Environment and Forest (MOEF) is responsible for formulating appropriate plans and programs and coordinating the activities for protection and improvement of the environment, and the Department of Environment (DOE) under MOEF is the regulatory body with the mandate to enforce the environmental laws and rules (Bahauddin, 2014). MOEF was created in 1989 and the Department of Environment Pollution Control was renamed as DOE under the control of the ministry (Alshuwaikhat et al., 2007).

By virtue of power conferred upon him through the Environmental Conservation Act, 1995, the Director General (DG) of DOE can "give order, direction or issue notifications to the owners of any industrial plant for the improvement of the surrounding environment by controlling and mitigating any pollution caused by its activities", and in the case of violation, can serve closure notice (Bahauddin, 2014, p. 346). Apart from legal enfocement, DOE is also tasked with conducting research and development for environmental conservation and improvement, monitoring and investigating pollution sources, warranting pollution prevention, determining pollution limits, issuing environmental clearance certificate, and ensuring regular dissemination of information regarding environmental pollution among other responsibilities (Bahauddin, 2014).

The Policy-Making Process in Bangladesh
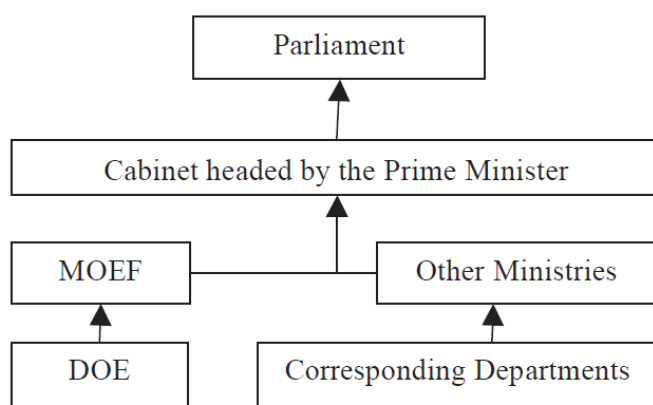
FIGURE 8   Policy-making process in Bangladesh (Alshuwaikhat et al., 2007, p. 234)

Environmental governance and policy-making process in Bangladesh are typically executed by DOE, like many other corresponding government departments, which through their corresponding ministries subsequently seek approval from the Cabinet, headed by the Prime Minister, that makes key decisions, formulates policy and sends it to the Parliament for enactment through scrutiny and debate (Alshuwaikhat et al., 2007). Some remarkable policy and

laws adopted by DOE include Environmental Policy, 1992; Environmental Conservation Act, 1995; Environmental Conservatino Rules, 1997; Environmental Court Act, 2000; National Environmental Management Action Plan, 1995; and Sustainable Environmental Management Program, 1997 (Bahauddin, 2014). In Bangladesh, the Parliament is the sole authority for enacting laws and MOEF along with the DOE play a major role in enforcing the laws, but views and opinions of the civil society groups are increasingly taken into consideration in environmental policy and decision making (Bahauddin, 2014).

Although Bangladesh has made positive changes in institutional and legal aspects of the environmental governance, there are causes for concern: the DOE, for example, is deemed weak due to the lack of qualified and trained personnel, inadequate stuff at the regional levels and the decision-making power being concentrated only at the top of the hierarchy, whereas the environmental NGOs and civil society groups often lack power, thus struggle considerably due to the lack of resources and heavy dependence on external support (Bahauddin, 2014).

3.8 Visual expression of the theoretical framework

In summary, the theoretical framework for this study seeks to explore the perceptions of various policy actors and stakeholders by capturing their awareness, knowledge levels and views with regard to the problem itself, and governance mechanism, including institutions (relevant laws, rules or norms), structures (relevant decision making bodies, formal organizations and informal networks) and processes (environmental decision making, or policy-making process, and associated problematics).
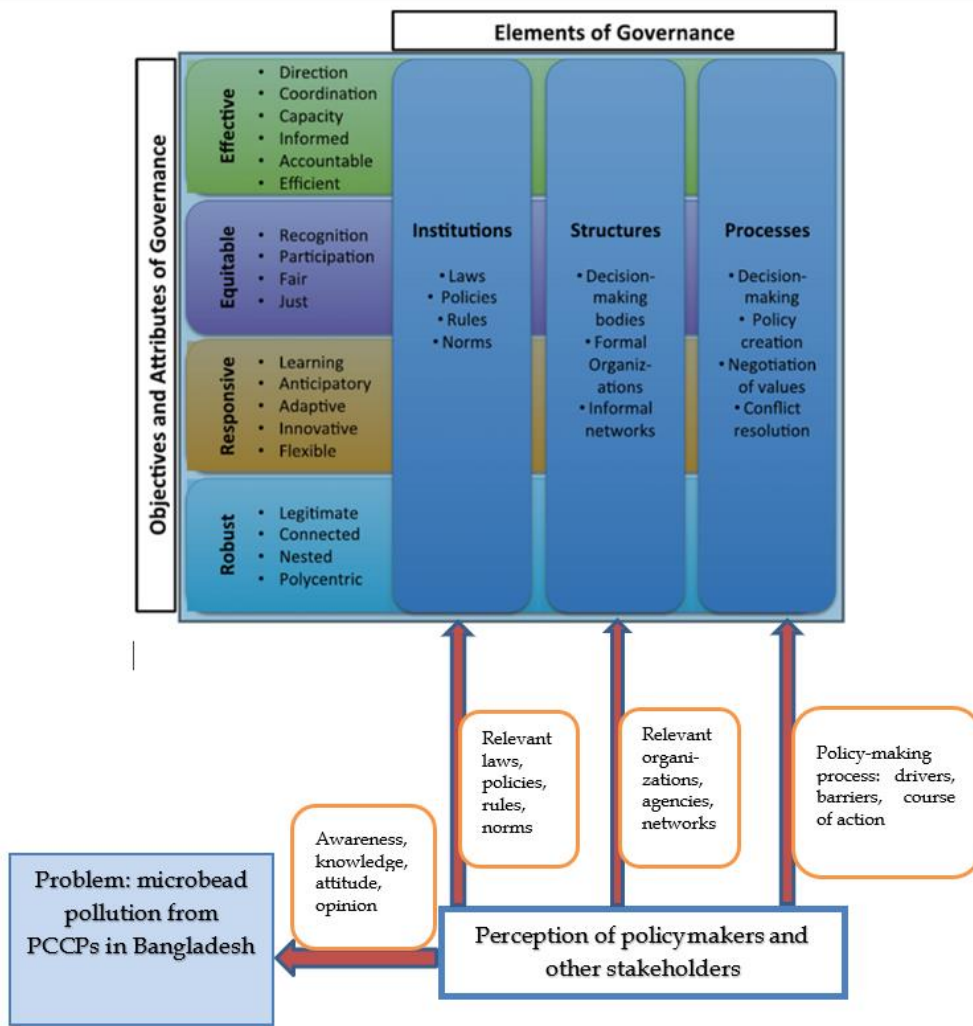
FIGURE 9   Theoretical background for this study

4   RESEARCH DESIGN

This thesis intends to discover the perceptions, awareness and knowledge level of relevant policymakers and other stakeholders about the microbead pollution and their views and recommendations about the environmental governance and policy actions to tackle this problem in Bangladesh. Therefore, this study seeks to explore views of the key informants, representing government agencies, industry representatives, experts and civil society groups, who are very familiar with and often involved in high-level decision-making process in Bangladesh. The issue of microbeads is mostly covered in the literature from developed country perspectives. The topic for this study is fresh in a sense that it seeks to capture the views of and recommendations from relevant stakeholders about the microbead issue from a developing country perspective. The following sub-sections explain what was done in designing and in implementing this study.

4.1   Research task

The research task is to understand the perception of the policymakers and other stakeholders regarding the microplastic pollution from personal care and cosmetics products (PCCPs) in Bangladesh and relevant environmental governance. In order to approach this task, four research questions have been developed:

1. How do policymakers and other stakeholders perceive microbead pollution from PCCPs in Bangladesh?
2. What types of policy instruments do they perceive to be the most effective in the context of Bangladesh?
3. What institutions and structures of environmental governance mechanism in Bangladesh do they perceive to be the most relevant?
4. What are their perceived drivers and barriers in policy-making and policy implementation regarding microbead pollution from PCCPs in Bangladesh?

4.2   Philosophical Worldview

Philosophical ideas remain predominantly concealed in research (Slife & Williams, 1995). However, researcher philosophical worldviews do have an impact on the work they carry out (Creswell, 2009). Creswell (2009) identify four types of worldviews: postpositivism, constructivism, pragmatism and advocacy/participatory. After looking at the characteristics of the four worldviews, I personally associate myself with the fourth one: advocacy/participatory worldview. This

worldview is "typically seen with qualitative research" and holds that "research inquiry needs to be intertwined with politics and political agenda" (Creswell, 2009, p. 9). Creswell explains that this worldview may emerge from the idea that constructive stance may not go as far as advocating for an action agenda to help marginalized people. Kemmis and Wilkinson (1998) argue that with advocacy/participatory philosophical worldview, researchers advance an action agenda for change and engage with study participants as active collaborators in their inquiries.

As has already been discussed in the introduction chapter, my motivation for this study stemmed largely from the vulnerabilities of the ecosystem and human health from microplastic pollution, particularly in the developing countries. My experience as an intern from October 2017 to January 2018 at Environment and Social Development Organization (ESDO), a Bangladeshi environmental NGO, was really helpful in gaining empirical insights on this issue. ESDO has been working for environmental conservation and social justice since 1990, and recently started a project, called "Combating the Pollution Threat from Micro plastic Litter to Save Marine Health in the Bay of Bengal", funded by Plastic Solutions Fund. It did a market survey and found microbeads in some products; fish samples collected from different cities had also provided evidence of the existence of microplastics (ESDO, 2016). It also conducted a baseline survey among 3800 respondents, comprising consumers and retailers, and found awareness level among consumers about microbead pollution very low (ESDO, 2016). Observing limited exposure of governance issues on microplastic pollution in developing countries, I was interested in the policy and governance aspects. Therefore, I wanted to conduct an exploratory research about the awareness level and perceptions of other stakeholders, including industry actors, public sector officials, academic experts and relevant civil society groups, about microplastic pollution from PCCPs. I also wanted to know their expert views and recommendations on various governance interventions and perceived barriers during policy-making and implementation in the context of Bangladesh. Finally, I wanted to learn the possible roles they think they can play in the fight against microbead pollution. Therefore, my intention was to actively engage in those interviews, to identify perceived barriers, listen to their recommendations and collaboratively identify the opportunities to make a positive change.

4.3   Qualitative Research Method

Qualitative research method has been used for this study since this method seeks to infer "meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions of things", as opposed to "counts and measures of things" sought by quantitative research (Berg, 2001; p. 3). Qualitative study differs from quantitative study in the sense that the purpose of the former is to understand the significance of the phenomenon inquired from the perspective of the affected

parties (Merriam, 2009). In addition, qualitative study can offer a thorough understanding of the social world around humans (Ormston et al., 2014) by focusing more on the context and emergent connotations, as opposed to predetermined structures, and leaving more room for interpretation (Marshall & Rossman, 2006; Patton, 2002). Berg (2001) argued that researchers typically use qualitative research method to observe how people learn about and make sense of themselves and others.

This study seeks to understand the perceptions and views of policymakers and other important stakeholders with regard to microbead pollution from PCCPs and an effective governance mechanism in the context of Bangladesh. These actors approach this environmental issue with different levels of experience and understanding. They have different concerns and motivations and different perspectives on the actions required to facilitate solutions. Therefore, it is important to capture their own articulation of the context and explanations of the social world around them. Qualitative method fits this study better since this method offers the participants opportunities to express themselves more freely using their own words and expressions, rather than limiting them with only a few options. Thus, there is a greater chance of understanding the actual phenomenon, as opposed to getting a partial picture. For an example, I asked the participants about their opinion on an effective policy instrument in the context of Bangladesh. Of course, the participants would have a limited number of choices in front of them, but while giving their answer in the qualitative research method, they are provided with the opportunity to elaborate their answers, which leave greater details and room for interpretation. Moreover, the focus of the study was quality, rather than quantity, of the data. Also, the scope of the study allowed me to conduct this study using a relatively small sample size, which would have otherwise restricted me from achieving statistically meaningful results. Last but not least, my philosophical worldview also goes hand in hand with qualitative research, as it was discussed in the previous section. Therefore, I found qualitative research a fit for purpose for this study.

4.4   Data collection

Qualitative data can be collected through observations, interviews, documents and audio-visual materials, each type having its advantages and limitations (Creswell, 2009). This study seeks to gain perspectives and views of the study participants with diverse backgrounds and experiences regarding microbead pollution in Bangladesh and potential governance mechanism. This required in-depth discussions, exchanging views and clarification of details with the participant. Hence, only observation, documents and audio-visual materials would have not served the purpose of the study. However, they could be used for supplementing the research data for triangulation purpose. In this study, for example, I searched for news articles with the term 'microbead' at the online portals of 3 prominent

Bangladeshi newspapers: 1 English, and 2 other dailies had both Bengali and English versions.

Nevertheless, the primary data collection for this study was carried out conducting qualitative interviews, which are typically deployed to identify participants' line of reasoning (Patton, 2002), and their views and experiences (Kelly, Bourgeault, & Dingwall, 2010). Interviews could take the forms of face-to-face one-on-one interview, telephone interview, focus group interview and email interview (Creswell, 2009). For this study, focus group and email interview were not favoured, because it was difficult to have a common schedule for all the participants, and I was fearful that their email responses would not be as detailed as I would have expected. For data collection for this study, altogether I conducted 12 interviews, among which first 7 were face-to-face one-on-one interviews, whereas last 5 were telephone interviews. The face-to-face interviews were conducted during my stay in Bangladesh between 13 November and 6 December, 2017. After that I returned to Finland, and subsequent interviews were conducted over telephone.

Qualitative interviewing involves a variety of techniques, such as structured, unstructured or semi-structured interviews, with different levels of flexibility and rigidity in interview structure, content and wording (Kumar, 2007). This study used semi-structured interview with open-ended questions, because the interviewees represented diverse backgrounds and levels of knowledge, and to get relevant responses, it required a little bit of flexibility in the structure and wording. However, totally unstructured interviews could have meant loss of control in questioning and diversion from the topic, thus risking comparability of the data (Kumar, 2007). In addition, semi-structured interviews provide the investigator the opportunity to probe further and get clarifications, while maintaining a systematic and consistent order (Berg, 2001).

The interview questionnaire comprised 10 key questions, leaving room for a number of probing questions. The first few questions sought to discover participants' knowledge, awareness and attitude towards microplastic pollution, in general, and microbead pollution from PCCPs in Bangladesh, to be specific. The next set of questions attempted to capture their awareness, views and opinions on the governance intervention against microbead pollution from PCCPs globally and also in the context of Bangladesh. The final set of questions intended to elicit their views and opinions on more specific points, e.g. policy making, policy implementation, governance structures and institutions, relevant problematics and possible role of engagement. The themes for the questionnaire were adapted from the work of Anderson and her colleagues (2016), who conducted a qualitative study exploring the perceptions and views of environmentalists, beauticians and students in the UK on the use of microbeads in personal care products, their sources of information, and their opinions on possible solutions. I modified the questionnaire to include the perceptions and views of representatives from relevant industry, government, academia and civil society groups taking the

example of a developing country with theoretical lenses from policy and governance literature.

The interview questionnaire and interview process somehow evolved with the course of time. As it is described earlier, depending on the background of the interviewee and the need for information, questions' wordings were changed even though the structure and content of the questionnaire remained the same. The duration of the interviews ranged from 20 minutes to 40 minutes, depending on the information they wanted to share, their level of understanding and interest on the subject, and their hectic schedule: all of the participants held important positions in their corresponding fields and had years of experience. Nevertheless, with every interview experience, I was able to provide more clarity to the questions. Another learning point was the medium of communication: first couple of interviews were conducted in English, but noticing that one of the interviewees actually provided a lesser amount of and slightly ambiguous information, I switched to Bengali in the subsequent interviews. All in all, four interviews were conducted in English, as against eight in Bengali. Despite my best intentions and being a native speaker of Bengali and proficient user of English, I acknowledge the probability of translation bias while transcribing those interviews conducted in Bangla.

4.4.1 Identifying participants for the study

In qualitative research, the issue of sampling has very little relevance since the main purpose of the qualitative inquiries is not statistical generalization, but to explore or describe the diversity in a phenomenon or an issue (Eriksson & Kovalainen, 2016; Kumar, 2007). Therefore, identifying participants for qualitative research is typically purposeful, as opposed to representative and random sampling used in quantitative research (Eriksson & Kovalainen, 2016). Kumar (2007) argued that interviewing participants for qualitative research should continue as long as the findings have not reached saturation point, at which point no new knowledge or information comes through the data collection process.

The participants for this study were identified by using key informant technique (Tremblay, 1957; Marshall, 1996). Key informant interviews entail "interviewing a select group of individuals who are likely to provide needed information, ideas, and insights on a particular subject" (Kumar, 1989, p. 1). Key informant interviews are qualitative in-depth interviews with people with profound knowledge of the phenomenon being inquired who, therefore, are likely to provide important insights about the nature of the problem and make valuable recommendations for solutions in a relatively short period of time (Marshall, 1996). Tremblay (1957) identified a few characteristics of key informants: their formal role should expose them continuously to the kind of information required, they should have adequate knowledge to meaningfully engage in and contribute to data collection, they should be willing to cooperate, they should have proper communication skills to convey their knowledge and they should be relatively impartial. Kumar (1989) recognized the appropriateness of key informant

interviews in certain situations which are relevant to this study: for example, when general, descriptive information should suffice decision making, when perceptions of the underlying motivations and attitudes of a target group are sought, and when the key purpose of the study is to make suggestions and recommendations.

The advantages of conducting key informant interviews are several. First, key informants are likely to provide detailed and rich data that can be collected in a relatively easy and inexpensive way (Marshall, 1996). Second, it gives the interviewer the opportunity to build a rapport with the respondent and create an atmosphere conducive to exchanging views and opinions rather freely (Kumar, 1989). Thirdly, through the interviewees the interviewer can often learn about and get to the next key informant (Marshall, 1996). In addition, interviewing key interviewees can be a convenient way to raise awareness, interest and enthusiasm around an issue (Tremblay, 1957). Finally, through the engagement and relationship built, the interviewer can contact the informants later to get clarification on ambiguity and any unresolved issues (Tremblay, 1957). On the downside, interviewer sometimes can be misled to select the right key informants who can bring useful insights about the phenomenon (Marshall, 1996). Moreover, interviewing key informants could be challenging, of particular concern is getting access and adjust scheduling, since key informants may have quite a packed schedule (Kumar, 1989). In addition, interviewing a small sample of key informants may not reflect the complete picture of the phenomenon being investigated (Marshall, 1996).

This technique suits this study very well in the sense that this study required a relatively small number of informants, due to the limited scope of the study, to be knowledgeable enough to discuss environmental governance and policy issues in Bangladesh, give opinions and make recommendations. All the 12 interviewees met Tremblay's 5 characteristics of key informants, though I was not 100% confident of their subjective bias. However, while conducting their interviews, I did not find their positions or statements significantly biased. In addition, since one of the key purposes of this study was to capture perceptions and views of government officials, industry actors, civil society groups and academic experts, through this technique it would be easy to learn about and reach the next relevant informant. Since during the period of data collection, I was working as an intern at ESDO, I used its network to get access to Department of Environment (DOE), which is the key organization as to environmental governance in Bangladesh, and also Bangladesh Standards and Testing Institute (BSTI), which sets limits for product standards. I also got access to one international NGO and two academia/scientist through ESDO's network, one of them even chaired the Cosmetics Committee of BSTI. In addition, while interviewing one key informant, I got to know that Directorate of National Consumer Rights Protection (DNCRP) was another key government agency, which has mandates to protect consumers' interests and rights. I also tried to get voices from other civil society groups, dealing with consumer rights and environmental justice. However, getting access to those organizations was quite challenging for me, since all of them held

important positions and had quite hectic schedule and priority issues. I earnestly wanted to get interviews of one environmental lawyer, who kept rescheduling the interview. Nevertheless, the toughest experience I had while collecting industry voice.

4.4.2 Attempts/Struggles to collect industry voice

During my stay in Bangladesh, I tried to conduct many companies operating personal care and cosmetics industry in Bangladesh. I made repeated phone calls and sent emails to the companies seeking for an appointment for an interview. Nobody bothered giving a reply, and those who received phone calls made excuses and reluctantly invited to visit their office. On 13.11.2017 I tried to visit one local company, which was one of the largest cosmetics and toiletries companies in Bangladesh. I wanted to meet someone who knew the production process and R&D issues very well. I had to wait there because he was unavailable, and then there was the lunch break. Fortunately, after lunch I was given permission to meet him. I also managed to conduct an interview with him. In his interview, he claimed that his company does not use microbeads in their products. He also welcomed the banning of microbead use in PCCPs. Then he even led me to conduct another interview of one of his seniors, who unfortunately refused to cooperate. He (the senior official) mentioned that in order for him to agree to sit for an interview he required permission from the administration department. When I went to the administration, I was told from the department that the person who was supposed to grant permission had been outside the country.

Thereafter, I headed towards another big local company. There I had a brief chat with one of the officers from the product development department. He said that they were very much aware of microplastics and related pollution. He also claimed that his company does not use plastic microbeads. However, he, as was the case in my previous attempt, refused to sit for a formal interview mentioning that such interview would require administration's permission. He asked me to send the questionnaire. I sent the questionnaire by email, but I have never received a reply. I followed it up with phone calls, but he was busy on every occasion. I also had a chat with his senior, who also claimed his company does not use microplastics, but refused to give a formal interview mentioning that they were very busy people and there were some business secrets.

Next day I targeted companies located in another hub. First, I went to one local company. They kept me seated for a while, contacted the admin department and came up with the answer that such interview would require special permission and the person who would typically grant such permission was out of the country at that time for an official visit. Nevertheless, they promised to keep me informed, but I have never been contacted. I then went to one of the biggest MNCs' office, but could not pass through the security, who asked whether I had an appointment. While I requested to go and contact the admin department to make an appointment, I was replied that this must have been done by email or phone. I had tried to contact in both ways, but have always been unfortunate in

getting responses. In the meantime, I went to another multinational's office. I met there the admin manager, who was very busy with some audit work. He said the whole office had been busy with this, but promised, after hearing that I lived and studied abroad, to arrange a meeting later. However, as I followed up over phone, he first procrastinated and later refused to cooperate.

On the other hand, in order to get importers' points of view, I tried to contact their industry association. Over several days of information exchange and persuasion, I finally managed to conduct an interview with one of the leaders. In total, from cosmetics and toiletries industry operating in Bangladesh, I managed to conduct two interviews: one from manufacturing companies, another from importers.

TABLE 3   Details of the interviews

No	Mode	Representation	Designation	Date
1	Face-to-face	Industry	Head of R&D and QC	13.11.2017
2	Face-to-face	DOE (GOV)	Director	22.11.2017
3	Face-to-face	Academia	Professor	22.11.2017
4	Face-to-face	BSTI (GOV)	Assistant Director	23.11.2017
5	Face-to-face	INGO	Country Representative	3.12.2017
6	Face-to-face	Industry	Secretary General	5.12.2017
7	Face-to-face	DNCRP (GOV)	Deputy Director	6.12.2017
8	Telephone	NGO	President	14.12.2017
9	Telephone	Academia	Professor	31.12.2017
10	Telephone	NGO	Secretary General	27.11.2018
11	Telephone	DOE (GOV)	Director	9.12.2018
12	Telephone	NGO	Chief Executive	21.12.2018

4.5   Ethical considerations

The knowledge production through research work, including data collection through qualitative interviews, requires good ethical practices, such as informed consent, avoidance of deception, and protection from causing harm among others (Eriksson & Kovalainen, 2016). Kumar (2007), for example, argued that it is unethical to collect information from the participants without their knowledge, and stressed that participants' consent should be informed and voluntary. Confidentiality is another crucial aspect which should be given due respect (Gray,

2013). Researchers also need to be mindful of any bias they bring to the research by intentionally temper the research outcome (Kumar, 2007).

While conducting the qualitative interviews for this research, all the participants were explained the purpose of this research topic, sent questionnaire in advance, if requested, and made sure the participation is voluntary. All the interviews were recorded with their permission, and all the participants were assured that their confidentiality will be protected, and the data will be destroyed after the end of the research. Conscious attempts have been made to keep them anonymous in writing the thesis, although their professional affiliation has been mentioned to bring clarity to the context. For an example, one participant representing a government agency will be described as Interview 4, GOV. Finally, I made my best intention during the research not to bring any deliberate bias while reporting, even though I acknowledge my subjectivity related to my educational background, training, competence and philosophical worldview (Kumar, 2007).

4.6   Data analysis

Data analysis for this study has been carried out using the method of qualitative content analysis, which refers to the process of analyzing the content and meaning of various types of qualitative data (Eriksson & Kovalainen, 2016). Zhang and Wildemuth (2009, p. 2) argued that "Qualitative content analysis involves a process designed to condense raw data into categories or themes based on valid inference and interpretation". Data analysis for this study, I roughly followed the guidance provided by Creswell (2009), see FIGURE 10. As it was mentioned earlier, the data for this study was collected through qualitative interviews using semi-structured questionnaire, which was adapted from the work of Anderson and her colleagues (2016) and modified with elements from policy and governance literature. In total, I conducted 12 interviews, comprising of 4 government representatives, 2 industry representatives, 2 scientists and 4 civil society actors. All the interviews were recorded, 8 of them had to be translated from Bengali to English, and then transcribed manually.

The transcribed data was read multiple times to gain an extensive overview of the data. Based on the observation, I started summarizing the responses in four broad categories or themes.

1. Awareness, knowledge, attitude of the participants toward microplastic and microbead pollution from PCCPs in Bangladesh.
2. Sources of information and perceived drivers of change.
3. Views and opinions of the participants on an effective governance mechanism to tackle this pollution in Bangladesh.
4. Perceived barriers in policy-making and policy implementation.

As regards the first theme, I tried to categorize different levels of awareness and knowledge of the participants regarding microplastic pollution, in general, and microbead use and pollution from PCCPs in Bangladesh, to be specific. The coding for the levels was straightforward: 'Good', for those who had profound knowledge and awareness of the issue, 'OK' for those who had just general idea, but not deep understanding, and 'No' for those who were completely unaware of the issue. For Bangladesh specific context, the coding was simply 'Yes' or 'No'. Coding for attitude towards microbead pollution included 'Stop', 'Discourage' or 'Continue as usual'. The coding for the source of the knowledge or information stemming from the participant responses included 'ESDO-workshop', 'news' and 'research'. Besides, I tried to complement this including important actors, events and contexts (Weible et al., 2012) that the participants mentioned and found significant to drive a policy change to tackle microplastic pollution.

As regards, knowledge and awareness about governance interventions made against microbead pollution in other countries, I put the coding: 'Yes', 'Not specific' and 'No'. For Bangladesh specific context, the coding was simply 'Yes' or 'No'. Regarding choice of instruments perceived effective in Bangladesh context, coding was adapted from the categories, see FIGURE 7, compiled by Brennholt and her colleagues (2018), which they found relevant for combatting microplastic pollution. In addition, interviewees were further probed to identify and comment on relevant institutions and governance structures, see FIGURE 5, in the context of Bangladesh. These were coded according to the name of the relevant laws, policies, norms, constitution, government agencies, informal networks or any other decision-making bodies. Finally, a new theme emerged compiling the problematics perceived by the interviewees with regard to environmental governance and policy change. The coding for these categories was adapted from the literature review (see TABLE 2). However, since the perceived barriers were not always exactly the same as mentioned in the literature, the coding for the individual barriers emerge from the participants' responses.
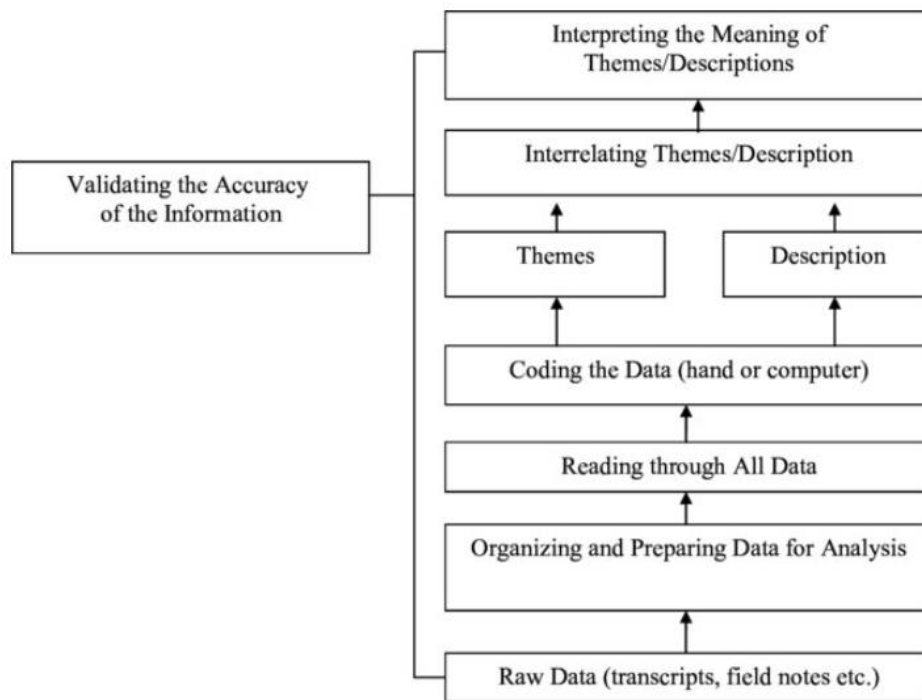
FIGURE 10   Data analysis in qualitative research (Creswell, 2009, p. 185)

5   RESEARCH FINDINGS

This chapter presents the study findings in four different, but closely related sections. The first section seeks to summarize the levels of awareness, knowledge and attitude of the interviewees towards the microplastic pollution in general, and microbead pollution from PCCPs in Bangladesh. The following section extends this to include the sources of knowledge and perceived drivers for policy change. The third section seeks to capture the opinion, views and recommendations of the interviewees to address the issue. This includes their choice of policy instruments and identified institutions and structures that they perceive to be relevant and/or mandated to make and implement the policy. The final section seeks to encapsulate perceived barriers to policy action.

5.1   General perceptions of the interviewees towards the problem

Interviewees showed different levels of awareness and knowledge regarding microplastic pollution, in general, and microbead use and pollution from PCCPs in Bangladesh, to be specific. The coding for the levels was straightforward. 'Good', for those who had profound knowledge and awareness of the issue, 'OK' for those who had just general idea, but not deep understanding, and 'No' for those who were completely unaware of the issue. For Bangladesh specific context, the coding was simply 'Yes' or 'No'. The coding for the source of the knowledge or information stemming from the responses included 'ESDO-workshop', 'news' and 'research'. As we proceed with the analysis, half of the 12 interviewees had participated in ESDO's inception workshop in 2017 and received background information on the issue from there. A few of them had been actively involved in the research process on microbead pollution in Bangladesh, thus had deep understanding of the issue. Remaining half were somehow distant from ESDO's immediate network, three of whom were completely unaware of the issue and two received information from the media especially after the World Environment Day of 2018, the slogan of which was 'Beat Plastic Pollution'. The remaining one had been working in the R&D department of a manufacturing company for over 20 years, and he himself was very familiar with the issue.

Half of the interviewees had known the examples of the governance mechanism adopted in other countries by that time, two more had been aware of, but missed country-specific information. For example, they knew some countries in the West banned microbead-containing PCCPs, but could not remember the names. Remaining four were completely unaware of any government intervention or policy adopted in other countries to combat microbead pollution from PCCPs. When it comes to government intervention or planning to address this issue in Bangladesh, only 5 of them, including those government officials working in Department of Environment (DOE) and Bangladesh Standards and Testing

Institute (BSTI), said that they heard or knew that government was alert and considering some governing options to address this issue, whereas the majority (7) said they heard no discussions from the government side.

As regards attitude towards the problem, ALL interviewees irrespective of their professions, positions or background stated that they wanted this practice to be stopped. In fact, two of the industry representatives even said that they would welcome any ban imposed by the government on using plastic microbeads in PCCPs. For example, interviewee 1 claimed, "Some companies declare that it is scrubber, it is very beneficial for screen and so on. But personally I think it is not true. Because I am a chemist, I hate this bogus." Similarly, interviewee 6 said, "I think, they [other companies also] as citizens of a country, conscious citizens of a country and as a human, if you have human sentiments inside, you should welcome this." A few NGO representatives and scientists claimed these plastic microbeads to be 'unnecessary ingredients' (Interviewee 5; 10), compared these with 'time bomb' (Interviewee 9) and even termed adding these beads to PCCPs an act of 'cheating' (Interviewee 5; 10). Bureaucrats also held the same opinion. Interviewee 4, for example, said, "We cannot just leave it. For our next generation, we should, as much as possible, avoid these products", whereas Interviewee 7 was more expressive, "It should be completely banned, because it's a threat to life. […] It's scary like slow-poisoning and gets us like cancer".

The summary of the general perceptions of the interviewees towards the microbead pollution in Bangladesh is presented in TABLE 4. However, a few words of acknowledgement, in all cases, when interviewees missed any information or were unaware of, I sought to inform them and explain in order to facilitate the discussion. The idea was not to coax them, but to ensure level playing ground for the continuation of the discussion. Nevertheless, I do acknowledge the likelihood of subjective bias from those explanations, but would still maintain that without providing that background information, I would not be able to receive relevant responses from them.

TABLE 4   Summary of the general perceptions of the interviewees towards the problem

Topic	1	2	3	4	5	6	7	8	9	10	11	12
	Industry	GOV	Scientist	GOV	INGO	Industry	GOV	NGO	Scientist	NGO	GOV	NGO
Awareness, knowledge of microplastic pollution	Good	OK	Good	Good	OK	No	No	No	Good	Good	OK	OK
Awareness, knowledge of microbead pollution from PCCPs in Bangladesh	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	No
Source of knowledge, awareness	News	ESDO-wor	Research	ESDO-wor	ESDO-wor				Research	Research	News	News
Awareness and knowledge of governance mechanism against microbeads in PCCPs in other countries	Yes	Not specif	Yes	Yes	Not specif	No	No	No	Yes	Yes	Yes	No
Awareness and knowledge of governance intervention in Bangladesh in this regard	No	Yes	Yes	Yes	No	No	No	No	No	Yes	Yes	No
Opinion, attitude towards the use of microbeads in PCCPs in Bangladesh	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop

5.2   Sources of information and perceived drivers of change

Interviewees, while talking about the issue and sources of their information and motivation for engagement, mentioned a number of factors that could be used as 'proxy' drivers for policy change. Weible et al. (2012, p. 3) rightly argued that "policy process is the study of change and development of policy and the related actors, events, and contexts". According to key theories of policy-making process discussed in chapter 3.4, different types of external and internal factors, including the beliefs and actions of policy and political actors, advocacy coalitions, policy entrepreneurs, significant events and the broader context, play their parts in bringing salience to a policy issue, finding acceptable policy solutions, and thus mobilizing public will and political will, leading to policy change.

5.2.1 Trigger event: World Environment Day

Although the issue of microplastic pollution, especially from personal care and cosmetics products, has caught attention of the policymakers in the global North over the last few years, the issue has largely been overlooked in developing countries, like Bangladesh. One trigger event that has brought the issue to larger audience is this World Environment Day in 2018.

> *When the issue of plastic pollution came to light, in recent times, especially this World Environment Day's subject of discussion was plastic. So the issue of microplastics and microbeads was raised along with the issue of plastic pollution. (Interviewee 11, GOV)*

> *The slogan of the World Environment Day was 'Beat Plastic Pollution'. I heard, read and learnt from there how these are getting into the ocean, what problems they are causing, what impacts they are having on marine biodiversity and so on. (Interviewee 12, NGO)*

This reinvigorated interest in plastic pollution drives policy action against microbead-added PCCPs. This is further fueled by policy advocacy carried out by civil society groups.

5.2.2 Advocacy coalitions

NGO advocacy often plays important roles in initiating a policy change. Environment and Social Development Organization (ESDO) has been active in policy advocacy to restrict the use of plastic microbeads since 2016. ESDO is also a partner NGO of 'Beat the Microbead' – an international campaign against microplastic ingredients in cosmetics. ESDO launched on 16 September 2017 a Project Inception Workshop on 'Combating Microplastic Pollution, Protecting Marine Life in the Bay of Bengal', which was one of the pioneering endeavours in Bangladesh to create public awareness regarding microplastic pollution.

It was not known to me. I mean just very recently I attended a workshop organized by ESDO, and I mean, my knowledge regarding the environmental pollution by microplastics was very limited. And that workshop really enlightened me about the pollution. (Interviewee 5, INGO)

ESDO also did some studies on microplastics, the impacts of microplastics in different uses, and we had some bilateral meetings with ESDO and from the Department I also participated in some dialogues organized by ESDO. So now we understand what is the impacts, what is the harmful impacts to public health, to environment as a whole. (Interviewee 2, GOV).

NGOs use different communication channels to make public and policymakers aware of the issue at hand, but the advocacy campaign gets propelled if it is undergirded by different stakeholders, including media.

5.2.3 Media coverage

Another driver that plays a significant role in expediting policy action is media. The issue of microbead or microplastic pollution has received some media coverage in Bangladesh, and it has drawn attention of some of the interviewees.

A few days ago, I heard that from the news: in toothpaste some companies use plastic microbeads, but I am not sure. (Interviewee 1, Industry)

I only know superficially. I don't have the scientific knowledge. I only saw in some newspapers. (Interviewee 8, NGO)

See, we are not yet well-informed about microbeads, but there are still some discussions in the media. (Interviewee 4, GOV)

Media thus play an important role to create public awareness as well as diffuse an environmental norm on a particular issue of concern.

5.2.4 Global trend in environmental governance

Global examples or diffusion of environmental norms often influence countries to take policy measures on certain environmental issues. International organizations, like WHO and UNEP, have repeatedly warned against the use of plastic microbeads (Interviewee 9). In recent years, the manufacture, import and sale of plastic microbeads containing personal care and cosmetics products have been banned in many countries including the USA, Canada, the UK and India among others. Such global trend can drive policy change in Bangladesh as well.

It has been done in many countries, then why it is not in this country? You cannot sustain with the thing which is health hazardous and also harmful for the environment. (Interviewee 5, INGO)

In particular, practices in neighbouring countries also have big influence. Interviewee 8 was curious: "What is the situation in India, South Asia?" The advantage of having examples of governance mechanism in other countries is more clearly articulated in the words of interviewee 10.

Yes, usually if there are some examples, e.g. other countries have banned. And most of the government like this, because if they see that neighboring countries are coming forward, then they think they also need to be moving forward. (Interviewee 10, NGO)

Moreover, the existence of international protocols or global conventions often drives policy change at national levels. In the words of Interviewee 11,

[…] it would be more useful if there are international protocols, or multilateral environmental agreements, or any convention is signed, because they are internationally agreed and often legally binding. Secondly, governments [from developing countries] often benefit from technological development and financial assistance if there are multilateral agreements. (Interviewee 11, GOV)

A strong force in this regard could be the Plastic Convention, a global convention in the making and driven forward by United Nations Environment Assembly (UNEA) for combatting marine pollution and microplastics (Interviewee 10).

5.2.5 Consumer awareness and complaints

Consumer awareness and complaint against such ill-practice of using plastic microbeads in PCCPs can trigger a legislative change in Bangladesh.

It would be best if we [BSTI] could get application from somebody who would mention that possibly these products used in Bangladesh contain microbeads. Then it can be done within a very short time. […] If any consumer files a complain, then they [DNCRP] can send us samples and request us to test. (Interviewee 4, GOV)

On products, DNCRP has a mandate, if somebody comes to us with a complain, we can make a proposal and send this to Ministry of Commerce. There is another way. If someone files a writ in the High Court, and the Court considers the writ, note if it is done by a good lawyer, if the Court directs the government to make a law, there comes a binding to the government. (Interviewee 7, GOV)

Therefore, it is understood that one consumer complaint with some well-planned thoughts can set a wildfire. As Interviewee 12 put it, "if you can bring and elaborate specific case, for example, if you could file a case that we tested and found that Unilever uses this, it would create hue and cry."

5.2.6 Prior success

Bangladesh has had previous experiences to take action against various polluting substances, like polythene shopping bags, several POPs and ozone depleting substances among others. Interviewee 11 claimed, "We have already phased out many things, so the phase-out is done gradually through a long plan." In particular, Bangladesh is one of the pioneering countries to ban plastic shopping bags in 2002. Interviewee 12 wanted to remember the events that led to the ban. She emphasized the importance of creating public voice to fight against plastic pollution.

We all started a campaign, because the drainage system of Dhaka City choked, resulting in a severe urban flooding. The government blamed plastics for this, since our waste management is not efficient, and we dump polythene bags everywhere carelessly. […] The issue of pollution of the Buriganga river and its protection became momentous. […] Then the government showing respect to public opinion banned plastic shopping bags by making an amendment to the law. (Interviewee 12, NGO)

Bangladesh is the first country to ban the plastic bag. What is the situation right now? Everybody is talking about plastic ban, and most of the world is moving forward for banning the plastic bag. So, it created the momentum. (Interviewee 10, NGO)

There is also a growing trend of enacting and implementing many public-friendly laws and institutions. As Interviewee 7 claimed,

[...] gradually in our country, many public beneficial laws are being made, for example, Consumer Rights Protection Act or Food Safety Act. […] it is pretty clear, and if caught, there are provisions of jail sentence and fine. It has been done in mobile courts in various districts. (Interviewee 7, GOV)

Therefore, these prior success and positive development may often drive Governments and public agencies take on new policy initiatives proactively, without being subject to external pressure.

5.2.7 Constitutional and statutory obligations

Statutory obligations often lead the Government and its relevant Departments to taking specific measures on certain policy issues. As Interviewee 2 explained, Bangladesh amended its Constitution in 2015 to include one specific provision: Article 18a, which reads "The State shall endeavour to protect and improve the environment and to preserve and safeguard the natural resources, bio-diversity, wetlands, forests and wild life for the present and future citizens."

[...] if the microbeads containing cosmetics do harm to the water bodies or biodiversity, so any people, citizen can sue the State that "you are not protecting" according to the Article 18a. So, you have to, being a state organ, everybody can sue the Department of Environment or the Ministry of Environment and Forest or the BSTI or any authority. (Interviewee 2, GOV)

Interviewee 2 further explained that the Department of Environment under the Environmental Conservation Act 1995 and related rules has mandates to protect the environment and public health, while BSTI has mandates to set standards for commodities, arrange testing and inspection, if necessary, and conduct product certification. Similarly, DNCRP has mandates for consumer protection. In other words, any individual, citizen or consumer, can hold the government, and its relevant departments and agencies with clear mandates, accountable, if his/her rights are violated. This can, on principle, drive government and its agencies to be proactive, rather than reactive, to protect its citizens and the environment from harm.

5.3 Views on effective governance intervention

As regards interviewees' perceptions about the choice of governance intervention, command and control appeared to be the most recommended policy instrument. All of the interviewees were in favour of imposing legislative bans against microbead use in PCCPs. Interveiwee 3 , interviewee 4 and interviewee 6 opined that the easiest way to regulate this ill-practice would be banning microbeads, revising technical standards for the relevant product categories, and bringing them under BSTI's compulsory Certification Marks scheme. Interveiwee 4 thought the ban could be immediate, since companies keep denying the use of microbeads in their products, whereas other thoughts that companies should be given more time to phase out the microbead-containing products. Almost half of the interviewees argued that besides banning, it is important to incentivize the companies to adopt good practicess. 3 of the interviewees mentioned that companies can take advantage of green image by voluntarily phasing out their microbead-added products, while others claimed that the context and culture of the country do not support voluntary approach. A few of the interviewees also requested persuasive and informational measures, such as product labelling and consumer awareness. TABLE 5 summarizes interveiwees' responses and recommendations with regard to policy instruments and course of action.

TABLE 5   Interviewees' recommendations as to appropriate government intervention

Category	Choice of instruments	1	2	3	4	5	6	7	8	9	10	11	12
		Industry	GOV	Scientist	GOV	INGO	Industry	GOV	NGO	Scientist	NGO	GOV	NGO
Command and control	Legislative bans	x	x	x	x	x	x	x	x	x	x	x	x
Command and control	Technical standards			x	x		x						
Voluntary approach	Voluntary commitment	x									x	x	
Financial burdens	Taxes			x		x			x				
Financial incentives	Subsidies/incentives	x	x	x									
Persuasive	Product labelling			x					x				
Persuasive	Awareness raising	x							x				x

As can be seen from the table, interviewees recommended a number of policy actions to tackle microplastic pollution from microbead use in PCCPs. First of all, there is an enormous need to create public awareness and consumer education. In order to drive policy action, public voice needs to be created and there comes the essence of awareness raising activities and campaigns. This awareness should be directed towards consumers, companies, policymakers and other stakeholders.

> *The most important thing is awareness, letting all know. Making law is not sufficient, if there is no enforcement. It is important to make people aware and inform them about the danger. There must be a law, but before that the lawmakers must understand what the drawbacks are. (Interviewee 9, Academia)*

In terms of regulation, there is a regulatory void to directly deal with the issue. Interviewees identified a few relevant Acts and rules, e.g. Environmental Conservation Act 1995, Environmental Conservation rules 1997, Environmental Court Act 2000, Safe Food Act 2013, Consumer Rights Protection Act 2009, Import Policy Order 2015-2018 and Bangladesh Standards and Testing Institution Ordinance 1985 among others.

As regards institutional mandates, interviewees cited a number of Ministries, for example, Ministry of Environment and Forest (MOEF), Ministry of Health and Family Welfare (MOHFWFW), Ministry of Commerce (MOC), Ministry of Industry (MOI) and Ministry of Local Government, Rural Development and Co-operatives (MOLGRDC) among others. However, three institutions that interviewees mentioned repeatedly are DOE (under MOEF), BSTI (under MOI) and DNCRP (under MOC).

The policy instrument deemed by the interviewees most effective is regulatory action. Many interviewees claimed that DOE can impose a legislative ban, others say that it is more to do with BSTI, which sets standards for commodities. Interviewee 4 mentioned that it would be much easier to include a parameter in the standard, whereas Interviewee 6 further explained that some of the PCCPs have been brought under compulsory certification scheme, and some have not. Hence, as a first step, those products which are known to contain microbeads, should be brought under the compulsory scheme, and then there comes the inclusion of a parameter in the standards.

> If it is to be stopped, an easy way in my opinion is that we have a government institution called BSTI that sets the standard. Among cosmetics, there are some items that are BSTI mandatory. If you identify, for example, they are in facewash, shampoo or toothpaste, by the way, shampoo and toothpaste are BSTI mandatory, they cannot be released without BSTI certification, but facewash is not mandatory. If facewash contains microbeads, if government wills, it can be made BSTI mandatory. (Interviewee 6, Industry)

> I would say that I was informed by the CM wing and also from other environmental organizations that you [companies] may be using plastic microbeads, even though you deny it. Even if you are not using these, in order to make sure that harmful products are not coming to our country, we are going to include a parameter. Then things will be under control. (Interviewee 4, GOV)

To develop a product standard or a testing method, interviewee 4 mentioned that BSTI could take advantage of its in-house research team or external support. As regards external collaboration, as interviewee 4 described, BSTI has a cosmetics committee, members of which are experts in the field and represent various stakeholder groups, including industry, consumers, academia and various government agencies. Meetings of this committee is the immediate forum for information exchange. According to interviewee 4, members of the committee share their knowledge and tools to solve any relevant problems on a national scale, whereas BSTI often benefits from regional and international cooperation; for example, with the EU, ASEAN and SAARC, members of which have been making

efforts to develop common standards in South Asia for certain products. Therefore, participants identified a number of partnership opportunities, both formal and informal, to tackle microbead pollution in Bangladesh.

TABLE 6   Relevant instruments, structures and partnerships

Category	1	2	3	4	5	6	7	8	9	10	11	12
Instruments	Industry	GOV	Scientist	GOV	INGO	Industry	GOV	NGO	Scientist	NGO	GOV	NGO
Constitution of Bangladesh 2010		x										
Environmental Conservation Act 1995				x	x							x
Environmental Conservation Rules 1997												
Consumers' Right Protection Act 2009												x
Food Safety Act 2013												
BSTI Ordinance 1985										x		
Product Standards				x		x	x					x
Product labelling			x					x				x
Import Policy Order 2015-2018												x
Structures												
MOEF			x						x	x	x	x
DOE		x			x						x	x
MOI			x	x					x		x	
BSTI		x	x	x		x	x	x	x	x	x	x
MOC									x			x
DNCRP		x		x			x					
MOHFW			x						x			
High Court							x				x	
Environmental Court												
Mobile courts								x				
DGF							x					
DGDA								x				
Phase-out time	5 years	5 years	5-7 years	0	3-4 years	.5-1 year	1 year			1 year	.5-1 year	
Partnership												
Public-NGO		x										
Public-private	x											
Private-University	x											
Inter-governmental agencies		x		x			x				x	
International collaboration			x	x					x		x	
BSTI committee of experts (cosmetics)			x	x							x	
NGO-NGO					x							
NGO-private									x			

How to initiate the legislative process received a number of suggestions. For example, a couple of interviewees (2; 7; 12) mentioned that the most effective way to start legislative actions is to file a writ case in the High Court through a skilled lawyer. Interestingly, although Environmental Courts exist in Bangladesh, these are considered ineffective, in practicality, by the interviewees (2; 12). Some interviewees (4; 7; 12) opined that the legislative process may commence if a consumer files a consumer complaint at DNCRP or makes an application at BSTI.

> *So, it's not possible through Environmental Court, but could be possible through High Court. But the ban needs to be imposed through Environmental Conservation Act and import policy order. […] You can impose standards by BSTI, whereby it would prohibit the use of microbeads. (Interviewee 12, NGO)*

> *On products, DNCRP has a mandate, if somebody comes to us [DNCRP] with a complaint, we can make a proposal and send this to Ministry of Commerce. There is another way. If someone files a writ in the High Court, and the Court considers the writ, note if it is done by a good lawyer, if the Court directs the government to make a law, there comes a binding to the government. (Interviewee 7, GOV)*

There were differences in opinions regarding phase-out time. One interviewee said that the legislative ban could be immediate, since companies deny using

microbeads, while other interviewees thought that companies should be given at least 5 years to phase-out microbead-added products, considering national circumstances, national capacity and socio-economic conditions. Some interviewees even called for weighing out various factors before making the final call.

> *To set up a time is difficult. I mean it needs many kinds of, I mean, math units to do here. Yeah, many factors are there. I mean I don't know about that, but 3 to 4 years should be good enough. (Interviewee 5, INGO)*

> *Let me say this. Since they said that they don't use these microbeads in their products, I would like to believe that they are not doing so. In that case, I don't think they should be given any time [i.e. the ban could be immediate]. (Interviewee 4, GOV)*

The implementation of the policy should be carried out in a coordinated manner. In this regard, DOE, BSTI and DNCRP can make a combined effort to ensure policy implementation and enforcement. Interviewees, in general, did not think enforcement will be a big challenge. Mobile courts at district levels could be an efficient means to ensure enforcement.

> *And being a regulatory as well as coordinating authority DOE can actually do some real coordination to make this happen, to move this process forward. So, we [DOE] can do the real coordination activity or coordination role in this particular case. […] I feel that we can advocate since we [DOE] are also government agency, key agency, on conserving the environment and protect public health, we can advocate BSTI and Consumer Protection Department [In fact, DNCRP] to actually do real work in this area. (Interviewee 2, GOV)*

Some interviewees also stressed the importance of making labelling as a requirement. They gave various instances, like in smoking, to make the packaging illustrative enough to inform the consumers about the harmful impacts. One interviewee also said that companies can declare that their products are microbead-free on the product labels.

> *We can take the example of the label of cigarette packs, whereby it's clearly written that smoking is injurious to health. (Interviewee 3, Academia)*

> *The first is labelling. If labelling details this information, about harmful effects of plastics and good effects of natural ingredients, then consumers will have some choice. They will naturally choose the good products and avoid harmful ones. Also, taxation of harmful products can be considered as well. For example, we have high tax on tobacco. (Interviewee 8, NGO)*

Other than regulatory measures, some interviewees (1; 9; 10) also discussed the possibility of having voluntary approaches, since companies may benefit from this green reputation for selling eco-friendly products. Provided that enough awareness is created and there is availability of natural alternatives and a market demand for microbead-free PCCPs, companies can take voluntary measures for business reasons. However, most of the interviewees stressed the need for legislative ban, saying that in the absence of a ban some companies will not stop using microbeads, at least in the context of a developing country like Bangladesh.

5.4   Barriers to policy change

There is a wide variety of factors that can affect the policy-making process and the success of policy outcome. However, there is a clear lack of agreement regarding the categories in the literature, and, understandably, the categories of the factors or barriers are often difficult to put under one single category as these are not always mutually exclusive. In this section, I seek to group the barriers perceived by the interviewees accroding to the categories developed in TABLE 2 synthesizing the review papers by Howes and his colleagues (2017), and Sippel and Jenssen (2010). According to the responses from the interviewees, the barriers to governance intervention regarding microbead pollution from PCCPs in Bangladesh have been divided into five groups: informational, economic, political, social/cultural, and technical-institutional. TABLE 7 seeks to summarize the individual responses.

TABLE 7   Perceived barriers to policy making and implementation

Category	Typical barriers	1	2	3	4	5	6	7	8	9	10	11	12
		Industry	GOV	Scientist	GOV	INGO	Industry	GOV	NGO	Scientist	NGO	GOV	NGO
Informational	Lack of awareness			x		x	x		x			x	x
	Lack of research, country-specific knowledge		x			x	x					x	x
	Lack of information regarding the manufacturing process									x			x
Economic	Perceived benefits of plastic microbeads			x		x				x			
	Industry resistance		x	x		x		x	x		x		
	Lack of economic incentives	x	x	x									
	National circumstance, capacity, socio-economic conditions		x				x		x			x	
	Complexities in the domestic market						x			x	x		x
	Concern over local production, industry viability		x										
Political	Lack of transparency and corruption						x			x			
	Lack of political will	x		x									x
	Fear of facing retaliation	x			x								
	Absence of powerful CSOs									x			x
	Nature of the problem and priority issue		x			x						x	
	Regime change												x
Social/Cultural	Lack of environmental consciousness	x						x					
	Human inertia/resistance to change			x							x		x
	Avoidance of taking responsibility						x						
	Transfer of technology and products					x				x			
	Regulatory culture												
Technical and institutional	Lack of testing methodology				x					x			
	Lack of coordination of among government agencies									x			
	Lack of clarity on appropriate agency and mandate		x										
	Inefficiency of environmental court		x							x			x
	Low level of technical and institutional capacity		x		x							x	x
	Lack of dedicated time												
	Lack of enforcement of law					x	x		x	x			x
	Absence of global agreement										x	x	

5.4.1 Informational barriers

Informational barriers, perceived by the interviewees, include lack of awareness, lack of research and country-specific knowledge, and lack of revealed information about product ingredients and manufacturing process.

Lack of awareness

The issue of microplastic pollution is a recent phenomenon worldwide. This is even much less explored in Bangladesh. Most of the interviewees informed that

the knowledge and awareness level among public, policymakers and even industry is not very high.

> *But to me, it looks like that many people, many people, even policymakers, researchers, they are not very much aware about the situation. So, and for me, definitely, though I work in the environmental sector, but I don't think I was very much aware about this, and like me, I think, a lot of people are not very much aware about the situation. (Interviewee 5, INGO)*

> *I would not say that we know much about this in Bangladesh. Those of us who are somewhat aware, we have recently become aware of this. Until recently, we had no idea about this. Public is not at all aware of the fact that these are used in Bangladesh. It can be said that they are completely unaware of this. (Interviewee 3, Academia)*

> *No, we don't know anything about this, and the government has not informed us anything about this. There have not been any discussions. There have not been any seminars. Usually there are some seminars or workshops in such situations. (Interviewee 6, Industry)*

Therefore, one big hurdle to overcome for bringing in a policy change is to create enough awareness among public, industry and policymakers.

Lack of research and country-specific knowledge

Another informational stumbling block regarding policy action is the lack of research and country-specific knowledge. It seems that there has not been much research carried out by different government departments, NGOs or academic institutions about microplastic pollution in Bangladesh. This is a huge barrier to a policy change in this issue. Policy-makers must understand the gravity of the issue in the national context before they commit to a policy action.

> *Yet we still don't know the degree of the impact or the extent of the pollution in our freshwater ecosystem. And we are still unaware of how microplastics are having impacts in Bangladesh, we don't have much research. (Interviewee 11, GOV)*

> *[...] frankly speaking, we don't have any specific idea or knowledge about this particular area, microbeads, but we've started learning this. […] We didn't conduct or carry out any specific study on these impacts, but we have got some study reports undertaken by different organizations. (Interviewee 2, GOV)*

> *I think extensive kind of study needed. And there is an underlying importance of this, and the thing is that I don't know, the manufacturers even, they know the danger of this using microplastics in their products. (Interviewee 5, INGO)*

> *In fact, in our country nobody did that research to that level. They are used in toiletries products, not in cosmetics. So far there have been no research and no discussions. […] how would you identify without research? You cannot ban all products grossly. (Interviewee 6, Industry)*

In the absence of comprehensive studies, it is difficult to identify which products contain microbeads and which do not. This is also compounded by the lack of

cooperation from the companies to disclose information regarding their manufacturing process and product ingredients. Interviewee 4, for example, argued that companies keep denying using microbeads in their products, while interviewee 9 mentioned that there is a lack of disclosure in the supply chain.

> [W]e are importing products, from whichever countries, I have no idea. I am saying I need this raw material, that raw material and so on, but those who are supplying do not tell us we are putting this material in this. You can be certain about the fact that these contain microplastics or microbeads (Interviewee 9, Academia)

5.4.2 Economic barriers

Economic barriers to governance intervention, perceived by the interviewees, include perceived benefits of plastic microbeads, industry resistance, lack of economic incentives, concern over national capacity and socio-economic conditions, complexities in the domestic market and concern over local production and industry viability.

Perceived benefits of plastic microbeads

Perceived benefits of plastic microbeads over safe, natural alternatives is a significant challenge to overcome. Microbeads offer some substantial benefits to the producers of PCCPs. Two perceived benefits, according to the interviewees, are lower cost of production and greater flexibility to producers.

> The main utility is: the natural ingredients that used to be used, let's say 50 years ago, have become much costlier. Microplastics are much cheaper. This is the main reason. Also, many properties can be incorporated in these. This is the magic of chemicals. If somebody wants to use body scrubbers of certain type, it is more convenient to do it through microplastics than any other ingredients. So, there are two obvious reasons: one it is cheap and another it is versatile and offers flexibility to the manufacturers. (Interviewee 9, Academia)

> Previously, coconut fiber [coir] and sand were used. These are automatically biodegradable. But what is happening now is that people, particularly companies, use plastic microbeads to make more profits. They argue that these lower down costs, so consumers can buy them at a cheaper price. […] Previously, what was made of natural ingredients could expire in two years, but these plastic microbeads are non-biodegradable. (Interviewee 3, Academia)

Some interviewees even claimed that microbeads offer no benefits other than satisfying companies' profit maximizing hunger. One industry representative said, "Some companies declare that it is scrubber, it is very beneficial for screen and so on. But personally, I think it is not true. Because I am a chemist, I hate this bogus." Some interviewees even termed it 'cheating'.

> It's benefit of the producers, because if you look at the 100 ml facewash in a tube, if 100 ml tube contains 20 ml microbeads, that means they can reduce their production costs by using microbeads, but the price of the sale is as it is. They are not compromising with the product price. This is a simple way how the manufacturers,

particularly the industry, makes more profit using microbeads. It's kind of cheating to the customers. (Interviewee 10, NGO)

Hence, these perceived benefits of microbeads over natural alternatives may drive companies continue toward the wrong direction.

Industry resistance

To make a policy change, changing status quo is a big stumbling block. Industry group can put up great resistance against policy action through lobbying. Interviewees, by and large, expected initial resistance from the industry citing phrases like 'part of the game' and 'this is normal'. Interviewee 4 informed that "[...] the manufacturers of the products that are presumed to contain microbeads have so far denied the use of these in their products." The manufacturers may even come up with 'counter-arguments' (Interviewee 8, NGO).

> *It depends on their profit margin. If it affects the margin too much, they will try to convince the government that the law is not needed. Another point is that if they see that it has been banned in other countries, they will try to observe how companies in those countries adapted, they will try to adopt that technology. (Interviewee 7, GOV)*

> *It is difficult to adapt a legislation directly. They will try to engage in a discussion with the government. […] Since it is a matter of industry and machineries, a company may have invested a huge sum of money for implementing the new process, so now going back to another process would not be easy […] (Interviewee 3, Academia)*

Lack of economic incentives

There is a strong need of establishing regulatory measures and ensuring strict enforcement. However, imposing regulations without incentivizing can lead companies to corruption and malpractices. Interviewee 2 rightly mentioned, "As we always say we need to use stick and carrot together." However, governments of developing countries, like Bangladesh, often rely heavily on legislation than market incentives.

> *Actually, we are aware of these measures, but in our country, we have not developed that culture. What happens in most cases in our country is imposition of strict regulatory measures. We have some example of providing incentives, I would not say none, but we have not developed that culture in broader sense. Suppose, our main target remains imposing a ban, complying, monitoring and enforcing. We typically keep to this circle. (Interviewee 11, GOV)*

Technology transfer from North to South

Another cause for concern is that the use of plastic microbeads is thought to be developed and practiced in the global North. As the adverse effects of using plastic microbeads have been known, developed countries have started putting restrictions on it. However, there are fears that companies in developing countries

might adopt this damaging technology and, being less environmentally conscious, continue using.

> *I said it has started from developed countries. I just put an example here like pesticides. Pesticides are not being used in many countries in the developed world, they don't use, but it started from there. So now they don't use it. But we [developing countries] are manufacturing it, we are using it. (Interviewee 5, INGO)*

One significant worry is the availability of plastics, and, in turn, plastic microbeads in Bangladesh. One interviewee explained how easy it would be to produce microbeads in the country.

> *Actually, microbeads and microplastics are composed of polypropylene and polyethylene. Actually, it comes from the by-products. It's not the original product. It comes from other products, after the end of life, they are made granules, this is typically the by-product of the second-grade plastic. (Interviewee 10, NGO)*

It suggests, local producers, if sense profitability, can easily produce microbead-containing products, since there is abundance of second-grade plastics in Bangladesh. Also, as regards regulation, companies tend to target less stringent markets, when their products suffer from stringency of regulation. In that case, developing countries, like Bangladesh, could be an attractive dumping ground.

> *I also need to know what countries they are imported from. If they are imported from India, it is possible to import all the time [neighboring country, easy to smuggle], despite having a ban. […] if there is a ban on import, then dumping will be less likely, provided these are not smuggled. (Interviewee 12, NGO)*

This brings us to the next barrier: complexities in the domestic market.

Complexities in the domestic market

There are different streams of products in the market of a developing country, like Bangladesh. On the one hand, there are locally manufactured products by domestic companies, there are also products from MNCs. On the other hand, there are imported products, e.g. from the USA or France, for high-end customers, together with imported, but low-quality products, e.g. from China. Added to the complexity, is the availability of fake products and smuggled products. Interviewee 6 here gave his own account of the situation, but it somehow reflects the complexity of the market.

> *Let's take the example of a garment labor, who earns 7000-8000 BDT per month. At the end of the month, who doesn't want to buy a lipstick, a face-powder or a facewash? But his/her buying capacity is within 100-200 BDT limit. The locally manufactured products are designed for them. That's what I think. Then there are fake products coming from China. You may call them copied, fake or counterfeit. We are not liable to giving protection for those products. It's responsibility of the government to give protection, but because of some government agencies or departments, what I mentioned before, these products are released through the loopholes in the regulations. (Interviewee 6, Industry)*

This complexity in the market and lack of accurate information make it hard to track and control the products. This is exacerbated by the lack of transparency in the system and corruption of the officials.

5.4.3 Technical and institutional barriers

Technical and institutional barriers, according to the interviewees, include lack of appropriate testing methodology, lack of coordination among government agencies, lack of clarity on appropriate agencies and their mandates, low level of technical and institutional capacity, lack of dedicated time, lack of enforcement of law, inefficiency of environmental court and absence of global multilateral agreement.

Lack of technical capacity for monitoring

Microplastic pollution from PCCPs could be a scientifically sophisticated issue. Testing and monitoring could be quite resource-intensive activities, which could pose a significant challenge toward resource-poor government authorities in developing countries, like Bangladesh.

> *We have one government organization, BSTI, which can check the ingredients and if they can afford, they can test these products overseas. They don't have testing method, virtually they don't have anything, this is the fact. Yet, they set some standards on the basis of the standards set by the outside world. […] They have started this recently. Previously, even this much they did not do. (Interviewee 9, Academia)*

> *I would say we must first identify whether the product contains microplastics, and there comes the testing method. In fact, on many occasions we seek assistance from you [stakeholders]. In many instances, we cannot do it alone, there arise many problems. (Interviewee 4, GOV)*

> *So, one challenge could be the lack of capacity of the government regarding monitoring. If the monitoring needs to be very extensive, it goes beyond the manpower capacity of the government, and the government does not consider it to be a priority. (Interviewee 12, NGO)*

Lack of coordination among government agencies

Lack of coordination among government agencies can halt the progress towards policy action. There are systematic challenges: lots of overlapping.

> *We do the same work from 3 sides by 3 people. Many ministries were not supposed to even exist. So many go for the same task. […] There are many, because I have noticed that we wanted to do something with Ministry of Health and Family Welfare, but they were stubborn and did not allow other ministries to cooperate. Now the government has started a new project bypassing them! (Interviewee 9, Academia)*

There is also an issue of power hierarchy. Ministries and public agencies often have power struggle and invisible power hierarchy. Interviewee 9, from his experience with government projects, nicely articulated his concern.

> *If Ministry of Commerce decides to import the products, Health ministry can do nothing about it, unless Health ministry finds some faults with that. Even if they find some faults, their influence on Ministry of Commerce is very little. Therefore, it depends on sincerity and cooperative attitude. (Interviewee 9, Academia)*

Ineffectiveness of environmental courts

Another challenge is the ineffectiveness of environmental courts. Bangladesh should have been very proud and happy to have Environmental Courts, which were set up for trial of an offence or for compensation under an environmental law. However, these environmental courts are not effective. As interviewee 12 said, "[…] it's not functioning at all. How would a joint district judge deal with such a scientifically sophisticated issue? So, it's not possible through Environmental Court […]" Similarly, Interviewee 2 mentioned, "Actually according to the existing Environmental Court Act, frankly speaking, it is not as effective as we had expected." As a result, it is very difficult in the context of Bangladesh to get a remedy of an environmental concern through an environmental court.

5.4.4 Political barriers

Political barriers, according to the interviewees, could include lack of transparency and corruption, lack of political will, fear of facing retaliation, absence of powerful CSOs, nature of the problem and priority issue, and regime change.

Lack of transparent mode of operations

Lack of transparent mode of operations can hinder the monitoring and enforcement greatly. Interviewees (12; 6) expressed their concerns against the overall lack in transparency and good governance, and the extent of corruption within the governance and administrative systems.

> *For example, I don't have the necessary equipment and tools for testing. So, if I need to carry out the test by an external party and it has already been bought off by the company, then! […] You know in Bangladesh, if you pay 2 bucks, they will say in your favour, and if I pay 3 bucks, they will say in my favour. Because there are experts to give reports, aren't there? [sarcastically saying] (Interviewee 12, NGO)*

> *Let's say I import a container of products, but in order to release them I need to go through numerous hurdles, whereby I cannot but pay speed money. The corruption is spoiling me. I myself am getting corrupt. The whole system is corrupt. We need to change that. The major complexities in this case are created by the bureaucrats. I would not put blames on the government [i.e. political parties]. […] If corruption can be stopped, other things will stop. Then the law can be enforced. Law has not been enforced, since corruption continues. (Interviewee 6, Industry)*

Apart from corruption, there is also lack of transparency in manufacturing process or revealing product ingredients. Some interviewees doubted whether manufacturers or importers themselves have access to the information, if yes, whether they are required to provide that information to consumers, to a comprehensible manner.

> *[...] even if Bangladesh does not do anything, since it is a part of the world economy and trade, it must be cautious about it. Because we are importing products, from whichever countries, I have no idea. I am asking, I need this raw material, that raw material and so on, but those who are supplying do not tell us we are putting this ingredient in this [material/product]. (Interviewee 9, Academia)*

Therefore, it is understood that without sincerity of the responsible personnel and transparency in the system, it will be very difficult to achieve a desired outcome.

Lack of political will

Nevertheless, from developing country context, all efforts may go in vain if there is a lack of political will. According to the interviewees, political will is one of the most important factors in driving policy change, without which valiant efforts may simply go in vain. Interviewee 6 confidently said, "If government takes initiatives to stop this, definitely it will stop". Interviewee 3 has given the example of banning smoking in public, "we have stopped smoking cigarettes publicly". However, if there is a lack of political will and sincerity, it is difficult to make much progress. Interviewee 12 gave an example of the banning of polythene shopping bag in Bangladesh in 2002. She said that the ban was a big success and was, indeed, implemented for the first couple of years. The unfortunate change, however, came with the turn of the political regime.

> *I wouldn't say that it [polythene ban] was never implemented. It was implemented, but the government made it lax, and it was no longer a priority for the successive government. [...] As far as I am concerned, no government wants to give credits to the other [rival party government]. This could be another reason for this lethargy. This is the reality of Bangladesh. (Interviewee 12, NGO)*

Visibility of the issue and lack of immediate impact

The nature of the microplastic pollution is that it is not readily visible, and the impact is not immediate. Interviewee 9 compared this with 'time bomb', whereas interviewee 7 revealed, "it cannot be seen easily, it's like 'slow and steady wins the race'. It's scary like slow-poisoning and gets us like cancer."

> *In fact, the extent and severity of environmental pollution in our country is so great that more attention is paid towards visible pollutions. [...] Issues like microbead pollution are still less-explored, especially visible impacts are still rather unknown. (Interviewee 11, GOV)*

Therefore, it may be difficult to place this issue of microbead pollution in the agenda setting. Developing countries, like Bangladesh, are confronted with so

many problems that this type of issue may often get overlooked by the highest policymakers, or less prioritized.

> *[…] it is still not there even for the food products, whether what kind of adulteration it is being going on there even in manufacturing food stuff. I don't think so, there is 100% control mechanism is there. So how can you think about cosmetics? (Interviewee 5, INGO)*

The power and expertise of the Civil Society Organizations (CSOs)

The power and expertise of the Civil Society Organizations (CSOs) play a critical role in pushing some issue in the agenda setting and forcing policy change. However, developing countries often lack powerful CSOs that are strong enough to break through the corporate resistance.

> *Even in US EPA, companies can do many things through bribing, but public is so conscious that this type of influence does not sustain. Here lies the same problem, but here we do not have such conscious citizens and powerful organizations. […] ESDO is trying, but ESDO is not that powerful. (Interviewee 9, Academia)*

Interviewee 12 also opined that MNCs are typically scared of bad reputation. She, on that note, questioned the courage and expertise of the NGO that discovered MNCs' double-standards, but could not hold them to account. Another problem is that CSOs fight for limited resource and get quiet when resource is exhausted. Interviewee 9 explained, "When there is a project, everyone fights for the share of the funding, when the money finishes, all interest is lost, and everyone gets silent."

Fear of facing retaliation

Fear of facing retaliation sometimes deters actors from taking pro-environmental action. For example, while asked whether his company will consider taking voluntary approach to declare microbead-free production, Interviewee 1 said, "In this moment, we have no action, because it is a political issue." It seemed his company was fearful of retaliatory measures from its competitors. Another government representative, while being asked about industry response strategy in the face of stakeholder pressure, responded uncomfortably and whispered "Please skip this question. You are asking too many questions [she was only half-joking]".

5.4.5 Social and cultural barriers

Social and cultural barriers, perceived by the interviewees, include lack of environmental consciousness among public, people's natural tendency to resist, avoidance of taking responsibility and lack of accountability of the professionals.

Lack of environmental consciousness and resistance to change

One big challenge to drive an environmental policy change is the lack of environmental consciousness and education of the general people.

> *The main challenge is that people are not easily convinced. People do not follow the rules easily if you say. People's minds are always reluctant. […] If we fail to educate and make the people aware, any good law cannot survive. (Interviewee 10, NGO)*

According to some interviewees, consumers in the lower-middle-income brackets are often cost-sensitive. They are likely to be misled to think short-term and choose products that are not best for the environment and human health.

> *[...] the solution is that people need to accept. They should use better product even if it costs a little more. We spend much more when we are ill. If we pay slightly more and stay healthy, that's better. People must think long term and compromise. (Interviewee 3, Academia)*

Reluctance in taking on the direct responsibility

For initiating a policy change, it appeared that most interviewees were reluctant to take on the direct responsibility. For example, the representative from the Department of Environment told that BSTI and DNCRP have stronger mandates in relation to this issue and need to do the 'real work'. On the other hand, the representative from BSTI said, "When something concerns the environment, Department of Environment needs to take legislative action". By contrast, industry representatives seem to safeguard themselves and put the responsibility on the government.

> *What you've just mentioned I heard it for the first time. We cannot work on this. It is government's responsibility. […] it's a long-term process. It's not possible for us. Who will take responsibility? (Interview 6, Industry)*

> *We always maintain this, but our government is not helpful. […] Ours is a poor country. I think in this moment, the government has no headache [regarding this issue]. (Interviewee 1, Industry)*

Lack of accountability of the professionals

Interestingly, while discussing human inertia as a type of barrier, one interviewee cited the lack of accountability of the professionals, who may keep silent in this issue as this may go against their business interest. Interviewee 12 referred to doctors, who may lag behind in the fight against microbead pollution simply owing to commercial interest.

> *Professionals, like doctors, who understand the risk, may keep silent, since this is not their priority. If it causes cancer, it would be better for them, because it will provide them with business opportunity (sarcastically saying). They are not into prevention. Another is commercial interest. (Interviewee 12, NGO)*

Value-action gap

Another set of barriers can be termed as value-action gap. Practicality and economic reality often deter people from carrying out pro-environmental behaviour, even if they are concerned with certain environmental issues (Blake, 1999). Interviewee 3 referred to a study whereby retailers and salesmen were asked whether they were aware of microbead pollution and its harmful effects. Almost 90% responded negatively. Then the respondents were informed briefly, and they realized the danger. However, when asked what their next steps would be, they replied, "We need to survive, we need to run our business. You better alert the companies so that they don't deliver [these harmful items]."

There could be other barriers at the individual levels. Many interviewees mentioned that investing dedicated time for this policy action is a big challenge for them. They have a number of priorities, where this issue needs to fit in and get atop. Some interviewees mentioned lacking strong evidence in support of their argument may be a deterring factor. Some also mentioned that lack of resources prevents them from engaging actively in this issue, while others were overwhelmed by the procedural burden.

6   DISCUSSION AND CONCLUSION

The research task seeks to capture the perceptions and recommendations of the policymakers and other stakeholders regarding the environmental governance mechanism to combat microplastic pollution from personal care and cosmetics products (PCCPs) in Bangladesh. In order to approach this task, four research questions have been developed. The first question attempts to understand the level of awareness, knowledge and attitude of the policymakers and other stakeholders regarding microbead pollution from PCCPs in Bangladesh. The second research question seeks to capture the opinion of the informants as to what policy instruments they perceive to be the most effective in the context of Bangladesh. The third question attempts to recognize the institutions and structures of environmental governance mechanism in Bangladesh that the informants perceive to be the most relevant. Finally, the fourth question seeks to identify perceived drivers and barriers in policy-making and policy implementation regarding microbead pollution from PCCPs in Bangladesh. The following section seeks to summarize and discuss the answers to the research questions one by one.

1. *How do policymakers and other stakeholders perceive microbead pollution from PCCPs in Bangladesh?*

This study has found that policymakers and other stakeholders show different levels of awareness and knowledge regarding microplastic pollution. Their perception of the problem can be predisposed by internal as well as external factors, such as learning, exposure to media, awareness campaigns, important events and the contexts they are living in (Weible et al., 2012). For example, those study participants who had attended ESDO's project inception workshop on combatting microplastic pollution appeared to be more aware of and knowledgeable about the issue than their counterparts. However, some interviewees claimed that with the slogan of Beat Plastic Pollution, World Environment Day in 2018, heavily promoted by UNEP, seemed to have drawn the issue of microplastic pollution, including that from microbead-containing PCCPs, to the larger audience. Media also played a huge part in it.

For triangulation, I searched for news articles with the term 'microbead' at the online portals of 3 prominent Bangladeshi newspapers: 1 English, and 2 other dailies had both Bengali and English versions. The search results showed 22 articles: 1 in 2014, 1 in 2015, 4 in 2016, 3 in 2017, and 13 in 2018, see Appendix 2. This may reflect the strong interests of media on microbead pollution in 2018, fueled by the slogan of World Environment Day of 2018 (5 June). Public issue life cycle (Rasche, Morsing, & Moon, 2017) could explain that this media and public interest could be followed by legislative interest. There are, however, two surprising findings: first, among 22 articles, only 1 was published in a Bengali version daily, as opposed to 21 in English; second, there has not been any news article on microbead in 2019 (results update until 31 May 2019). These could mean two things: the issue has lost its interest in Bangladesh, or ESDO, which was instrumental in

raising public awareness on this issue, achieved what it had sought to achieve. It raises another question, are all the promotional activities carried out only to show the donors? Finding answers to these questions is beyond the scope of the study.

As regards participant's attitude towards microbead pollution from PCCPs, all the interviewees, including those who had been unaware of the issue, but were briefed during the interview, held that this practice must be stopped. Some of their reactions included 'time bomb', 'cheating', 'threat to life', 'for our next generation', 'slow poisoning', 'gets us like cancer'. These reactions sound similar to 'weird', 'fake', 'Oh my God', 'feel really bad', 'dangerous' found in the article (2016, p. 457) by Anderson and her colleagues. One comment, 'unnecessary', was common in both studies. One interesting finding in this study was that even industry representatives were quite vocal against microbead use in PCCPs. Both the interviewees said that they would welcome any ban imposed by the government. One of them even argued that microbead use in PCCPs is completely unnecessary, adding that 'I hate this bogus'. This may give a rosy picture in the first impression, but this could also mean that I was unable to reach and convince the other industry representatives to sit for interviews for this study who might have different opinions.

2. *What types of policy instruments do they perceive to be the most effective in the context of Bangladesh?*

The study has found that most common type of policy instrument recommended by the policymakers and stakeholders in the context of microbead pollution was command and control: legislative ban, to be precise. This recommendation is in line with numerous scholars and policymakers across the world (Rochman et al., 2015; Environment Audit Committee, 2016; Anderson et al., 2016; Environment Council, 2014). Almost all the interviewees claimed that this would be the most effective instrument in the context of a developing country, like Bangladesh, but there the consensus ends. Participants' opinions have been polarized as to how to, and when to, impose a ban. Some argued that companies invested huge money to set up their plants, and they did their business following the rules and regulations of the country. Now if the government decides to impose a ban, it must give companies some time to phase-out. Opinions of the participants regarding phase-out time varied considerably. On the one hand, there are those who opined that the time should be at least 5-7 years, while others maintained that 0,5-1 year should be long enough. One even reasoned that companies should be given no time, since they keep denying using microbeads in their products. These variations in opinion could not be traced back to their professional affiliation or vested interest in the issue, but to their understanding of the practicality; which can be explained by the argument put forward by Hartley and his colleagues (2015) that people approach an environmental issue with different levels of experience and understanding, and different perspectives on the actions required to facilitate solutions.

Participants' opinions also varied with regard to the concept of policy bundling (Milkman et al., 2012), which typically refers to complex portfolio of tools

designed to address some aspects of a set of policy goals (Howlett, 2018). For example, to ensure policy compliance, some interviewees advocated incentivizing through taxes, charges or subsidies, along with legislative ban. Nevertheless, such concept of economic instruments is still relatively new in developing countries, and there is a clear lack of well-designed tools, which depends largely on political feasibility and contextual nuances for their success (Damon & Sterner, 2012). On that note, one participant argued that instruments like subsidies may not be good for the country, while another just rejected the idea of incentivizing arguing that the country does not have this regulatory culture, which rather promotes regulatory cycle of imposing a ban, complying, monitoring and enforcing. Therefore, policy design should carefully evaluate the nature or character of the policy tools, as well as the context in which the tools are going to be applied (Howlett, 2018).

One interesting finding of the study is the use of product standards to tackle microbead pollution from PCCPs. A number of participants opined that this could be the easiest way to deal with it. Extant literature on microplastic or microbead pollution has not focused considerably on product standard on this issue, except for a few like Kentin (2018), and McDevitt and his colleagues (2017), who proposed a new standard to facilitate regulation and encourage sustainable innovation in the wake of US Microbead-Free Waters Act. Moreover, persuasive instruments, such as product labelling and awareness campaign have also been considered by a few participants, the latter especially deemed essential to lay the groundwork for any other instruments to be successful. The effectiveness of labelling (Kentin, 2018) and awareness campaign (Steurer, 2013) has been well established in the extant literature.

Some participants argued that companies can take advantage of their green image by voluntary declaring that their products are micro-bead free. This is also observed by scholars like Dauvergne (2018). Moreover, some scholars (Jordan, Wurzel, & Zito, 2003; Steurer, 2013) argued that voluntary agreements can complement conventional command-and-control regulations. However, a vast majority of the participants opined that voluntary commitments would not work in a developing country like Bangladesh. The effectiveness of voluntary instruments in developing countries has also been questioned in the extant literature. Blackman (2008), for example, mentioned that voluntary approaches may fall apart in countries with weak regulatory pressure, weak non-regulatory pressure, e.g. from consumers and civil society groups, regulatory capture by powerful lobby groups and abundance of informal actors and SMEs, which are difficult to monitor and may act as free-riders. All these characteristics, to a large extent, have been existing in Bangladesh.

3. *What institutions and structures of environmental governance mechanism in Bangladesh do they perceive to be the most relevant?*

This study has found a variety of institutions and governance structure, from the perspectives of policymakers and other stakeholders, that could be relevant in tackling microbead pollution from PCCPs in Bangladesh. The responses largely

varied due to participants' professional affiliations and previous experiences. Interestingly, as Bennett and Satterfield (2018) conceptualized governance elements, participants identified both formal institutions (such as Constitution of the Bangladesh, Bangladesh Environmental Conservation Act 1995, Consumer Right Protection Act 2009) as well as informal institutions (such as cultural context, e.g. regulatory culture, unwritten power structure, e.g. power hierarchy among government ministries). Similarly, this study also confirms the existence and identification of formal structures (such as Ministry of Environment and Forest, Ministry of Commerce, Ministry of Industry), as well as informal structures (such as various types of partnerships, e.g. Public-NGO partnership, Public-Private partnerships and international networks) that serves governance capacity.

4. *What are their perceived drivers and barriers in policy-making and policy implementation regarding microbead pollution from PCCPs in Bangladesh?*

The study has found a number of drivers and barriers perceived by the policy-makers and other stakeholders in the context of microplastic pollution from PCCPs. According to the participants, in comparison to policy cycle theory, the microbead issue can be understood to be still on agenda-setting stage in the policy cycle (see FIGURE 6).
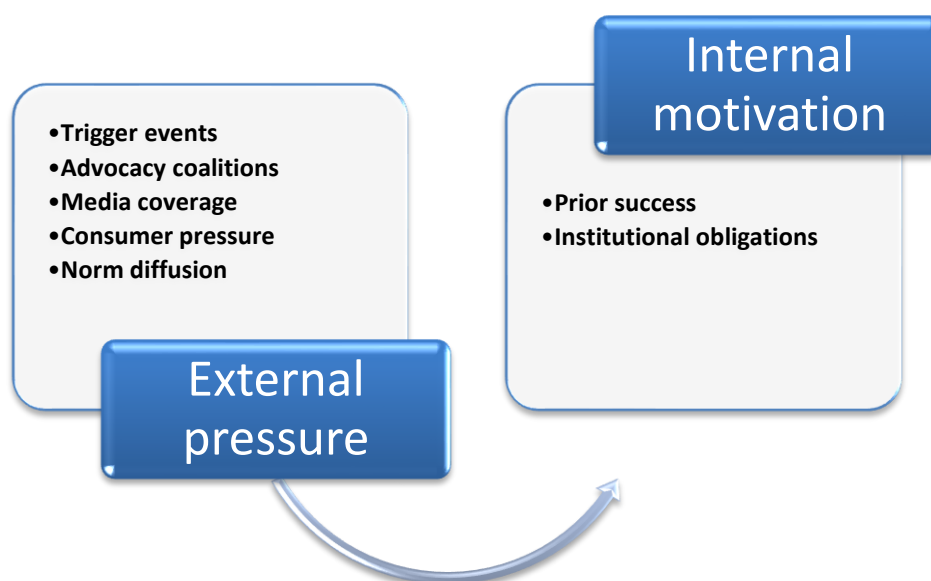

FIGURE 11   Perceived drivers of policy change

Seven significant drivers have been identified from the study that could take the issue to the next level, i.e. from public agenda to institutional agenda (Cobb & Elder, 1972). Interestingly, five of them could be considered external to government and public agencies, i.e. external pressure provoking reactive behavior, and remaining two could be considered internal drivers. The external drivers include trigger events, advocacy coalitions, media coverage, global trend in

environmental governance, and consumer awareness and complaints, whereas the internal drivers are motivation from prior success and institutional obligations. Theories of policy science, such multiple stream theory (Kingdon, 1984), advocacy coalition framework (Sabatier & Jenkins-Smith, 1999) and punctuated equilibrium theory (True et al., 1999) identify a range of internal and external factors, such as beliefs, actions of policy and political actors, advocacy coalitions, policy entrepreneurs, significant events and broader context. Comparing this to the study results demonstrates the missing of clear mention of policy entrepreneurs, who will connect multiple streams: problem stream, policy stream and political stream. There is a possibility that one of the study participants could emerge as a policy entrepreneur in this issue.

Informational
- Lack of awareness
- Lack of research, evidence
- Lack of visibility

Technical-Institutional
- Lack of testing methods
- Lack of resources
- Lack of coordination
- Ineffective environmental court

Socio-cultural
- Lack of environmental consciousness
- Human inertia
- Avoidance of responsibility

Economic
- Perceived benefits of microbeads
- Industry resistance
- Lack of incentives
- Complexities in domestic market

Political
- Lack of political will
- Lack of transparency and corruption
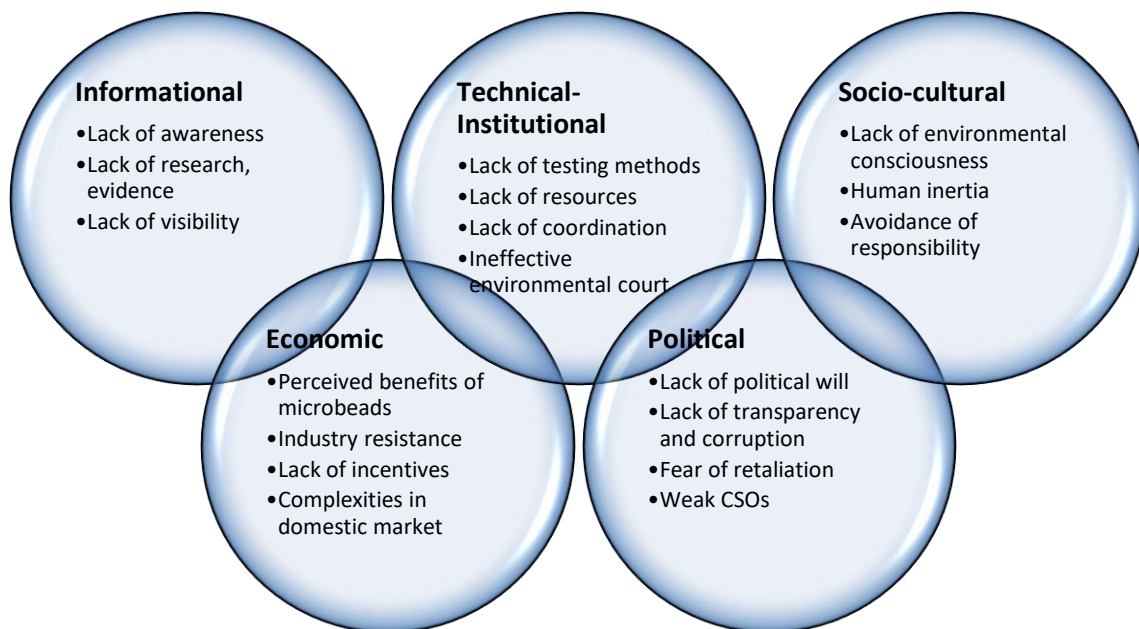- Fear of retaliation
- Weak CSOs

FIGURE 12   Perceived barriers to policy change

As regards barriers, this study found five general categories encompassing twenty-eight barriers that the participants identified for policy making and implementation. The general categories derived from the literature review (see TABLE 2), but the identified barriers are a bit distinct due to the contextual differences. One of the major barrier categories is informational: lack of research and country-specific knowledge deter the policymakers to understand the real impact of microbead pollution in Bangladesh, detect the microbead-containing products and take legislative/policy actions. Lack of research has been identified as a significant policy challenge in the literature (Sheppard et al., 2011; Buzar,

2008; Redclift, 2009), especially lack of local knowledge (Pastakia, 2002; Caviglia-Harris et al., 2003; Seyfang, 2005) has also been found as a significant barrier. Economic barriers include the perceived initial resistance from the industry, lack of economic incentives, complexities in the domestic market, concern over local production/adoption of bad practices. Industry resistance as barriers have been documented by Devkota (1999), Soloviy and Cubbage (2007) and Liu (2012), whereas lack of incentives as a barrier has been identified by Alshuwaikhat and his colleagues (2007) and Paker and his colleagues (2013).

Political barriers include lack of political will to take this issue as a priority, lack of transparency and corruption and weak civil society groups. Political will as a barrier to policy change has not been a new phenomenon (Rogers & Wilkinson, 2000; Jabbour et al., 2012; Buzar, 2008), whereas corruption has been a significant problem, particularly in developing country context (Boadi et al., 2005; Alshuwaikhat et al., 2007; Bahauddin, 2014). Social and cultural barriers include lack of environmental consciousness, resistance to change, and avoidance of taking responsibility. Devkota (1999), Pastakia (2002) and Carter (2013) showed how people's attitude and resistance to change could be a significant policy barrier. Technical and institutional barriers include lack of testing methodology, lack of sophisticated laboratory, lack of coordination among government agencies and inefficiency of environmental court. Developing countries' struggles with technical and institutional capacity also well-documented in the literature (Alshuwaikhat, 2007; Bahauddin, 2014; Zhang & Liang, 2012). From the context of Bangladesh, this study confirms Bahuddin's (2014, p. 352) findings regarding the state of the environmental governance: low priority for environment: lack of resources, low support from political leaders; weak understanding of environment-poverty-development link, weak enforcement of law, weak environmental authorities and cross-sectoral collaboration.

Interestingly, the study participants have not put much thought on the definition of microbeads and its implications on policy formulations (Dauvergne, 2018), neither they talked about policy evaluation (Jann & Wegrich, 2007). Another interesting observation is that government and industry actors are already alert about the issue, but the industry is adopting "avoidance strategy [that] refers to a strategy by which a focal organization loosens its attachments to stakeholder related claims and tries to guard and shield itself from the claims" (Aaltonen & Sivonen, 2009, p. 138).

In conclusion, this study identifies that the microbead pollution from PCCPs in Bangladesh poses significant risks, but policymakers and other stakeholders are not very much aware of it. Stronger awareness campaign has been recommended to increase the visibility of the issue and consumer awareness, which will lead to favourable political will and industry responses. Extensive study has been recommended to find out what products/brands contain microbeads. Policymakers and other stakeholders recognized relevant formal and informal structures and institutions that could drive the policy action. In addition, various opportunities for partnerships and collaboration have been identified to

fill in the governance gaps. However, there is a need for coordination of the agencies and clearly defined mandates and roles.

This study has implications for policymakers, NGOs, businesses and other stakeholders. Policymakers in Bangladesh, for example, through the study findings could identify the potential governance gaps in combatting microbead pollution and possible partnership/collaboration opportunities with external collaborators to bridge the gaps. NGOs, on the other hand, may find this study useful to reformulate their strategies to produce stronger advocacy and exert greater pressure on irresponsible businesses. Businesses, by contrast, can identify how policymakers and other stakeholders perceive the situation and possible course of action, based on that they can reformulate their response strategies for the changing regulatory environment.

The validity and reliability of this study have been ensured by maintaining certain protocols. Validity of qualitative study is not same as of quantitative study and maintained by the researcher by checking for certain procedure, such as transcribing the data and clearly explaining the data analysis procedures (Creswell, 2009). Similarly, the reliability of this study has been maintained by designing questionnaire and coding following previous studies from the literature (Gibbs, 2007).

The contribution of this study is three-folds. First, this study attempts to find out perceptions of policymakers and other stakeholders from a developing country perspective, which had been missing in the literature dealing with microplastic and microbead pollution. Second, this study seeks to connect literature from microplastic pollution and that of policy and governance. Third, this study seeks to identify perceived drivers and barriers to policy action against microbead pollution in Bangladesh in order to formulate a course of action.

The study is limited in various ways, e.g. in temporal, spatial and topical boundaries. Firstly, the data for this exploratory study was collected during November-December, 2017 (9 interviews), and November-December, 2018 (3 interviews). The interviewees represent relevant government departments and agencies, industries, academia and civil society groups, but their representation cannot be generalized. Moreover, this study deals with only pollution from using microbeads in personal care and cosmetics products in Bangladesh, thus ignores pollution from other types of microplastic pollution in Bangladesh, and also any type of microplastic pollution in other countries. Finally, this study only seeks to capture the perceptions, views and recommendations of the interviewees from their personal capacity. Even though the interviewees held important positions in their respective fields and had years of experience, their responses were only their own personal expressions, and thus cannot be interpreted as official statements of the organizations they represented.

Building on this study, future researchers can investigate on other developing country experiences. Those studies then can be used for generalizing results. Another future direction could be conducting research on stakeholder strategies,

e.g. how NGOs and businesses change their influence strategies in a dynamic regulatory environment. Another avenue for future research could be conducting explanatory quantitative studies to investigate on perceptions of policymakers on an environmental problem and their actual policy action to address that problem.

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Appendix 1: Interview questionnaire

1	How much do you know about microplastic pollution and its harmful effects on the environment and human health?
2	What personal care and cosmetics products (PCCPs) in Bangladesh contain plastic microbeads? What kind of microplastics are used in these products?
3	What is your opinion on the use of microbeads in PCCPs in Bangladesh (e.g. continue as usual/discourage/ban)?
4	Could you please mention some examples of governance mechanism applied in other countries for restricting the use of plastic microbeads in PCCPs (e.g. banning in USA, Canada, Taiwan; discussion in the EU/UK/India; Voluntary in Australia)?
5	What actions Bangladesh government is taking to restrict/eliminate the use of plastic microbeads in PCCPs? Are there any discussions?
6	How do you think a legislative ban on the use of microbeads in PCCPs could be enacted and enforced? Are there any specific acts (e.g. environmental conservation act 1995, environmental court act 2000, cosmetics guidelines 2017, consumer protection act 2009)? What would be the department(s) that could lead the action? What challenges do you foresee? How could these be solved?
7	How do you think companies would react to a legislative ban in Bangladesh on the use of plastic microbeads in PCCPs (e.g. avoid/resist/influence/compromise/adapt)?
8	How much time do you think the companies in Bangladesh should be given to phase out the use of plastic microbeads?
9	What do you think would be a more effective governance mechanism in Bangladesh context: market-based instruments (e.g. EPR, subsidies, taxes, fines), voluntary approach (public declaration: company, industry associations; CSR) or legislative ban? Why?
10	What do you think could be your (personal or organizational) role in restricting/eliminating the use of plastic microbeads in PCCPs in Bangladesh? (e.g. What is required to effect a legislative change and how would you contribute to accomplishing that?)

Appendix 2: Media coverage on microbeads in Bangladesh (2014-2019)

Newspaper	Date	Title	Reporter
Financial Express	October 30, 2018	The looming threat of microplastic pollution	Syed Tashfin Chowdhury
Daily Star	September 20, 2018	Microplastics may enter foodchain through mosquitoes	AFP Relaxnews
Daily Star	June 29, 2018	MAILBOX: Plastic pollution	Rafid Alam
Financial Express	June 29, 2018	Plastic debris in oceans -- a growing hazard	Mushfiqur Rahman
Prothom Alo	June 27, 2018	Eating fish, or plastic?	Saiful Samin
Prothom Alo En	June 15, 2018	Japan passes anti-plastic law	AFP, Tokyo
Daily Star	June 8, 2018	Plastic Pollution:From depending on it to drowning in it	Naimul Karim
Financial Express	June 4, 2018	Beating plastic pollution	Arif Ahmed
Prothom Alo En	April 23, 2018	'Plastic use increases 80 times since 1990'	UNB, Dhaka
Prothom Alo En	March 10, 2018	Krill could prove secret weapon in ocean plastics battle	AFP, Sydney
Daily Star	March 9, 2018	Krill could prove secret weapon in ocean plastics battle	AFP
Daily Star	February 20, 2018	Ban microbeads, save lives	Staff Correspondent
Financial Express	January 11, 2018	UK's May vows to eliminate plastic waste by 2042	Reuters
Daily Star	November 30, 2017	Glitter could be bad for environment	Star Online Report
Daily Star	September 17, 2017	Microplastic threatening lives: It's time to ban	City Desk
Daily Star	February 23, 2017	Tiny plastic particles clogging oceans: report	AFP, Geneva
Daily Star	December 31, 2016	2016: The good things in science, environment: Plastic microbeads to be b	Star Online Report
Daily Star	October 16, 2016	Tiny plastic, huge risk	Mohammad Al-Masum Molla
Prothom Alo En	August 24, 2016	Push for ban on plastic microbeads in UK	Reuters, London
Daily Star	January 3, 2016	Why did US govt suddenly ban a bunch of soaps and bodywashes?	Star Online Report
Prothom Alo En	August 27, 2015	Your facial scrub may contain millions of plastic particles	IANS, London
Daily Star	January 04, 2014	Microbeads pose environmental hazard	Professor M Zahidul Haque