Written submission to

WG1 – Children's exposure to environmental toxicants

UN COMMITTEE ON THE RIGHTS OF THE CHILD

2016 Day of General Discussion

"Children's Rights and the Environment"

Regarding

Children's exposures to mercury in Artisanal and Small-scale Gold Mining areas in Indonesia and in more than 70 countries

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1. Mercury in ASGM sector

Artisanal and Small-scale Gold Mining or **ASGM** practices documented in more than 70 countries (Telmer and Veiga 2009). Globally, UNEP identified mercury emission from the ASGM sector approx. 1000 tonnes of mercury to the air attributed to 37% of the global mercury emission (UNEP 2013). UNEP also identified ASGM as the largest single sector that released high mercury emissions from intentional use of mercury.

In 2011, Indonesia has around 850 artisanal and small-scale gold mining hotspots all over Indonesian region (Ismawati 2011). The ASGM sector in Indonesia contributed about 57% of the total national mercury released to the environment or about 195 ton (Dewi 2012).

Gold extracted from the river (alluvial or placer deposits) or from a complex underground rock mining in the mountain areas. After the ore were crushed, panned or milled, miners mixed it with mercury to form amalgam. The amalgam nugget then smelted to obtain gold. The milling and smelting process released mercury vapour to the surrounding environment. The remaining of the process water and the tailings or sludge in many places have been discharged to the local waterways, fish ponds and rice paddy fields (Bose-O'Reilly, Schierl et al. 2016) (Krisnayanti, Anderson et al. 2012).

When mercury enters the air, it moves with the wind and eventually falls back to earth. In the air, mercury may travel either a short or long distance before falling back or redeposited to earth; it may even fully circle the globe. A portion of the mercury that falls into the ocean or onto the land will re-volatilize; it will again travel with the wind and will again fall back to earth somewhere else. The mercury that falls on land and does not volatilize will likely bind to organic material. Some becomes trapped in peat or soils (Pacyna, Pacyna et al. 2010) (Pirrone and Mason 2009). Methyl mercury becomes part of the aquatic food chain; it bioaccumulates and biomagnifies, and it can then be transported by migratory species (fish and shell-fish) (Bell, DiGangi et al. 2014). That's why the WHO defined the exposures to mercury as a major public health concern (WHO 2014)

In many countries, ASGM practices took place in remote areas and impoverished communities. Miners and communities tried their luck by digging or dipping themselves in the murky water and then process it further in the water or at home. When miners process the ore at home, they installed and operates the ball-mills in the front yard, backyard or beside the house. Studies showed elevated mercury already detected in miners' urine, blood and hair (Gibb and O'Leary 2014) (Kristensen, Thomsen et al. 2014).

Pregnant women, women in child-bearing age, old women and housewives are very often also involved in this home industry, from crushing the rock until mixing the mercury, barehand, into the ball-mills. In several countries with ASGM, mercury also found in human breast milk (Bose-O'Reilly, Lettmeier et al. 2008) (Steckling, Boese-O'Reilly et al. 2011). Smelting the amalgam nuggets could be done any where around the neighbourhood, in the kitchen or around the house where babies and children presents. Considering the toxic effect of mercury, all children born, grow up and live in ASGM hotspots are in danger (Bose-O'Reilly, Lettmeier et al. 2008). Several cases of severe mercury intoxication and birth defects in children have found in several Indonesia's ASGM hotspots last year (BaliFokus and Medicus 2015) (Bose-O'Reilly, Schierl et al. 2016).

2. Minamata Convention on Mercury

The Minamata Convention on Mercury is a global environmental health agreement, signed by 128 countries in October 2013 and currently under ratification. The treaty's objective is to protect the human health and the environment from anthropogenic releases of mercury and mercury compounds (UNEP 2013).

Unfortunately the allowed use of mercury for ASGM sector under the Article 3 of the treaty has created different interpretations in the field. Some miners interpreted it as ***"mercury is allowed to use even by UNEP and by the mercury treaty".*** To avoid further confusion, this "allowed use for ASGM sector" should be deleted by parties.

The mercury treaty specifically provides for and highlights the need to protect human health. Special attention to health aspects addressed in the Article 16 aims to promote the development and implementation of strategies and programmes to protect populations at risk, particularly vulnerable

populations. An important requirement of the treaty is that information related to mercury and human health must not be kept confidential thereby highlight the public Right To Know about mercury impacts on their health (Bell, DiGangi et al. 2014).

As the gold extraction processes with mercury operated within the residential areas within the impoverished villages with no restriction of operational time, vulnerable populations especially children, child-bearing age women and pregnant women exposed to toxics vapour all day long. Children were born, grow up, play, inhale the air and ingested food and drink water in the mercury-polluted environment (Bose-O'Reilly, Lettmeier et al. 2008). Furthermore, methylmercury (MeHg) is a developmental toxicant, known to exhibit a long latency of effect ranging from 150-days after the exposures up to 15 years after the exposures (Weiss, Clarkson et al. 2002) (Basu, Goodrich et al. 2014).

The Article 16 on Health Aspects of the Minamata Convention on Mercury does not contain mandatory provisions but it encourages Parties to the mercury treaty to promote a range of health related measures.

The Article 16 of the convention regarding the Health aspect addressed:

1. Parties are encouraged to:

(a) Promote the development and implementation of strategies and programmes to ***identify and protect populations at risk, particularly vulnerable populations,*** *and which may include adopting science-based health guidelines relating to the exposure to mercury and mercury compounds, setting targets for mercury exposure reduction, where appropriate, and public education, with the participation of public health and other involved sectors;*

(b) Promote the development and implementation of science-based educational and preventive programmes on occupational exposure to mercury and mercury compounds;

(c) Promote appropriate ***health-care services for prevention, treatment and care for populations affected by the exposure to mercury or mercury compounds****; and*

(d) Establish and strengthen, as appropriate, the institutional and health professional capacities for the prevention, diagnosis, treatment and monitoring of health risks related to the exposure to mercury and mercury compounds.

The related health clause under Article 17 of the treaty text concludes,

"For the purposes of this Convention, information on the health and safety of humans and the environment shall not be regarded as confidential"

Information from government on known sources and impacts of mercury on citizens of their country should be made available and accessible for public. Information that has previously been classified should be released and publicised to raise the awareness about mercury pollution in the community and exposing industries or responsible group that may be responsible for creating mercury contamination.

3. Children exposures to mercury in ASGM hotspots in Indonesia

Exposures to mercury from the womb until the golden period, could lead to adverse health effect of the children and their cognitive as well as neurological development (Davidson, Myers et al. 2004) (Grandjean 2007) (Grandjean 2013) (Grandjean and Herz 2011) (Grandjean, Barouki et al. 2015).

Researchers have identified the most subtle effects of mercury as a neurotoxin on the children's cognitive ability and IQ as a result of global mercury pollution (Grandjean and Landrigan 2006) (Trasande, Schechter et al. 2006).

Furthermore, long-term impact of mercury intoxication could lead to high social-economy cost, less jobs and economic opportunity, family burden, good palliative care and lower quality of life (Yorifuji, Tsuda et al. 2011) (Trasande, Landrigan et al. 2005) (Ha, Basu et al. 2016).

In 2015, I myself and the BaliFokus team found 28 children who were born and living in three ASGM hotspots of Indonesia - Bombana in Southeast Sulawesi province, Cisitu in Lebak Regency in Banten Province and in Sekotong, West Lombok Regency in West Nusa Tenggara Province (BaliFokus and Medicus 2015). The children were born, grew up and live with their parents who are involve in gold extraction process using mercury.

I have witnessed and meet personally all of the children discovered during the period of 16 Feb - 6 March 2015 in the three ASGM hotspots have various birth defects, namely born without fingers (amelia), cerebral palsy, without ears (ear agenesis), only with one eye (eye agenesis), with cleft lips and palates, with upper or lower limb reductions, with head shape anomalies - microcephaly, hydrocephaly, with imperforate anus, with omphalocele or with intestines or other organs stick outside of the belly through the belly button, with weak arms and legs (muscular dystrophies), with lump on the forehead, and or with congenital cataracts.

As the children grew up, some of them have delayed development and or neurodegenerative anomalies and becoming mute and deaf. Some of them survived until age of 15, some of them could not make their 6 months old. In poor communities, health services also poor and lacking. The closest health clinics usually about 2-3 hours motor bike ride from their house. Most of the time, they could not afford to go to the health clinics and pay for the service.

After the discovery in Feb-March 2015, we found more children born with birth defects and severe effect of mercury years after the mining activities stopped. Unfortunately, the local health system and services are not available to provide proper medical assessment and treatment. As the results, some children died before receiving medical interventions. Some of them abandoned by their parents and sent them to relatives or the grandparents who have no knowledge about taking care of children with disabilities.

Based on the available statistics, I predicted that from 295,000 birth defects every year, at least 10% of it was due to mercury exposures (WHO 2013). The global figures are still unknown. Many of these children have been hidden or not allowed to go outside of the house by the parents or the families who are taking care of them. I believe that similar conditions will be found in other ASGM countries and waiting to be discovered and helped.

4. Mercury contamination here, there and everywhere

From various studies, it was estimated that every miner could produce 5-10 grams of gold per week. The ASGM sector could produced about 65-130 tonnes of gold per year, bigger than the national gold production which was 46 tonnes in 2013.

Global Mercury Project of UNIDO-UNEP (2007) reported that mercury in fish in Central Kalimantan around the ASGM site was ranging from 0.09 up to 1.6 ppm. Several studies conducted in Jambi 1977, West Kalimantan (2000), North Sulawesi (2002), West Java (2003) and Palu, Central Sulawesi (2008, 2010) found high mercury concentration in the river, soil, fish and rice affecting community and miners' health (Daniel Limbong 2003) (UNIDO 2007) (LIPI 2010) (Yuyun Ismawati 2013) (Krisnayanti, Anderson et al. 2012) (Tomiyasu, Kono et al. 2013).

Study conducted by BaliFokus and others in several ASGM hotspots, found mercury in the air also considerably high, ranging between 20 nanogram/cubic meter up to 55,000 nanogram/cubic meter also found in the food chain, especially rice and fish, risking the downstream population's health as well as the community who live within the area. Mercury in water and sediment in several ASGM sites are ranging from 0.6 ppm up to 4 ppm which is 600-3000 times higher than the WHO standard (0,001 ppm) (Krisnayanti, Anderson et al. 2012) (Tomiyasu, Kono et al. 2013) (Kakisina, Ali et al. 2015).

An inventory study conducted by my team in 2015 showed the ratio between gold extracted vs mercury used were between 1:1 to 1:200. It means to produce 1 gram of gold, miners used 1 gram of mercury up to 200 grams. This figure (1:200) considered among the highest ratio of mercury used to extract gold in ASGM communities in the world (Telmer and Veiga 2009) (Cordy, Veiga et al. 2011). If a miner produced 5-10 grams of gold per week, it means he used about 5 grams to 500 grams of mercury per week or about 2 kg of mercury every month *[field observations].* Most of them store mercury in a simple container, either an open bottle or a small bowl in the living room or in the kitchen - the same place where they cook the food for their families *[field observations].*

5. How the poor people got mercury

Based on the house visits and interviews with the parents, it is very clear that they have no awareness nor knowledge about the harmful effect of mercury. Most of them thought that the birth defects of their children were due to a bad luck or curses from their ancestors, squid, monkeys, etc. The parents of these poor children also did not know that mercury is a toxics substances because they can buy it easily in their villages or in town or from the gold financiers *[field observations].*

Mercury sold in small plastic packaging (100 gram), small bottles (1 kg), used energy drink bottles (1.3 kg), or a used mineral water bottle (12 kg) *[field observations].* Just recently, in October 2014, the Ministry of Trade issued a regulation (Permendag No. 75 year 2014) to prohibit the importation, trade and use of mercury for mining sector. However, the regulation did not include the prohibition of mercury production locally and the exportation of mercury.

As a consequences of the new regulation, local-distilled mercury sold cheaply, approximately 10% of the price of imported mercury. So, the market is now flooded with local mercury with low purity between 40-60% purity. This means miners/communities should use more quantity of mercury to extract gold. The worst part is that, due to the "affordable" price of mercury, now miners can buy more mercury than before *[field observations].*

6. Conclusion and recommendations

Many studies already revealed the impact of mercury and methylmercury exposures in humans as an irreversible adverse effect, debate continues concerning inter-individual variation in adverse neuro-developmental outcomes, progression of cardiovascular disease, various confounding factors, and latencies between exposure and health effect (Davidson 2004) (Grandjean 2008) (Takashi Yorifuji 2013) (Basu, Goodrich et al. 2014).

From my observation, there is a huge economic potential of the small-scale gold processing but the short-term and long-term negative impacts of the sector out weight the benefits. The ripple effects of the gold business ripped off the benefits for the people. Mercury uses in ASGM should be prohibited everywhere without any excuses as most poor countries, even when they have regulations in place, the enforcement is still lacking.

Recommendations for the global communities:
- Revise the "allowed use of mercury in ASGM sector" under the Article 2 of the mercury treaty:
- Stop trading harms, stop exporting and importing mercury especially for illegal use in ASGM sector;
- Find safer alternatives of mercury immediately and share it publicly;
- Share the affordable technology to clean the mercury-contaminated sites to ASGM countries.

Recommendations for governments:
- Prohibit the export, import, trade and use of mercury in ASGM sector;
- Health sector should be made aware about this issue, develop measures and steps to steps protect children from further poisoning;
- Provide/develop health system that allow children with disabilities grow up, play and receive education through special schools for disabled children in ASGM hotspots;
- Provide palliative health care support system in ASGM hotspots areas;
- Clean up the contaminated soils as soon as possible;

Recommendations for gold traders and miners:
- Stop using mercury immediately and use the physical-mechanical process to extract gold;
- Formalise your business in form of cooperatives or other type of business entities;
- Separate the processing areas from home, far from the residential areas.
- Stop using children as your cheap labours.

-END-

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