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SOCIO-CULTURAL FACTORS IN THE ACCEPTABILITY OF HEALTH RISKS AMONG HANDLERS OF WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) IN COTONOU

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Abstract

While the issue of appropriate management of waste electrical and electronic equipment (WEEE) is of greater concern to the most advanced countries today, African countries such as Benin pay very little attention to it. However, these countries are experiencing large flows of used electrical and electronic equipment and the appearance of a host of WEEE processing sites. Informal jobs are developing in these countries without taking into account the specificities of the sector in terms of health risk prevention. Thus, this situation exposes the populations and actors involved in these activities to various health risks linked to the handling of the said waste. The aim of this study was to expose the socio-cultural factors of the acceptability of health and environmental risks linked to the activity of handling WEEE among the handlers in Cotonou, through field surveys and analysis of social representations. The sites and respondents were selected using a reasoned choice approach. At the end of the in-depth interviews with 45 people selected at the main sites, it was possible to analyse the basis of risk minimising behaviour among the workers of the said WEEE.

After analysis, it appeared that the socio-demographic and professional

characteristics of the people involved in the WEEE processing sector lead to a low assessment of health risks, as well as of their working space. Furthermore, socio-cultural factors significantly influence the behaviour of workers when handling WEEE. With the perception of a remote health risk, prejudices related to the use of modern protective equipment and beliefs about ferrous materials, handlers engage in a process of trivialisation of modern protective measures in favour of the acceptability of the health risk. This attitude is reinforced by endogenous practices of health risk avoidance and unhappiness at work. In order to better target and curb these prejudices and beliefs, preventive interventions on health risks related to WEEE will probably have to use a combination of approaches capable of both providing preventive equipment and initiating education for a change in attitude and practices among handlers.

Keywords : Key words: Handlers of WEEE, risk acceptability, perceptions, beliefs, Cotonou.

FACTEURS DE L'ACCEPTABILITÉ DU RISQUE SANITAIRE CHEZ LES MANIPULATEURS DE DÉCHETS D'ÉQUIPEMENTS ÉLECTRIQUES ET ÉLECTRONIQUES (D3E) À COTONOU

Résumé

Malgré d'importants flux d'équipements électriques et électroniques usagés et le développement de métiers informels liés aux traitements des déchets d'équipements électriques et électroniques (D3E) dans les pays africains comme le Bénin, très peu d'attention est accordée à la gestion appropriée de la filière. Les acteurs respectent très peu les mesures de prévention des risques sanitaires. L'objectif de cette étude est d'identifier les facteurs socioculturels de l'acceptabilité des risques sanitaires chez les manipulateurs des D3E à travers des enquêtes de terrain à Cotonou et d'analyses des représentations sociales. Les sites et les répondants ont été sélectionnés de façon raisonnée et des entretiens ont été menés auprès de 45 personnes.

Il ressort de l'analyse que les caractéristiques sociodémographiques et les exigences du métier des acteurs conditionnent une faible évaluation des risques sanitaires. A cela s'ajoutent des facteurs socioculturels tels que la perception du risque sanitaire lointain, les préjugés liés aux équipements de protection modernes et les croyances sur le fer qui expliquent l'acceptabilité du risque sanitaire chez les manipulateurs des D3E. Dans ce contexte, il faudra favoriser l'accès aux équipements de prévention et à une éducation pour un changement d'attitude et de pratiques de travail des manipulateurs pour des interventions préventives efficaces du risque sanitaire.

Mots-clés : D3E, risques sanitaires, acceptabilité, métiers informels, Bénin

1- Introduction

The production of electrical and electronic equipment is the prerogative of industrialised countries, while the consumption of used equipment is the preserve of countries in the South [1]. In so doing, the consumption of used equipment creates waste, which is commonly referred to as waste electrical and electronic equipment (WEEE) or e-waste. This WEEE has become a growing problem due to the health and environmental issues associated with it. In African countries, many WEEE landfills have been created [2]. These WEEE carry toxic materials, which contain hazardous chemicals (in the form of dust, gas, vapour or liquid) and biological pathogens. These toxic materials in appliances, refrigerators, Hoover bags, air conditioner filters, can cause respiratory or digestive problems. These include brominated flame retardants, halogenated substances, refrigerants, fibres causing irritation, burns, acute or chronic poisoning, metals such as lead, mercury, rare earths, and gold [3]. In terms of risks, several studies have shown that handling D3E exposes the subject to changes in thyroid function, temperament, cell expression and function, adverse neonatal effects, decreased lung function, increased spontaneous abortions, premature births, low birth weight, DNA damage ([4]; [5]; [6]) More specifically in West Africa, studies conducted in Ghana over the past decade have revealed elevated blood concentrations of heavy metals

and flame retardants in W3E handlers ([7]; [8]; [9]). Concentrations of heavy metals and polycyclic aromatic hydrocarbons (PAHs), which are known carcinogens, have also been detected in urine samples of W3E handlers in Abgogbloshie ([10]; [11]; [9]).

Despite these enormous human health risks, it has been observed in African countries that W3E workers handle such equipment without adopting protective equipment [2]. Even today, the observation of the organisation of work on the W3E sites in Benin reiterates the fact that workers in this sector handle used and defective electrical and electronic equipment without consequently adopting protective equipment and preventive measures. By observation, during dismantling and burning, W3E handlers do not systematically protect themselves [3]. According to the results of a quantitative study, "60.5% of the handlers do not wear or regularly use protective clothing and/or equipment at work and 63.8% of the handlers stood close to the flame and kept it at a median distance of one metre" [3]. It is noted that non-governmental organisations (NGOs) are raising awareness among handlers at work sites. By observation, posters and signs from these NGOs showing the use of protective equipment at the dumping sites were observed to confirm the successive visits to the WEEE dumping sites according to the accounts of the respondents. Moreover, the NGOs had offered protective equipment kits to the handlers. Furthermore, protective equipment was available at affordable prices on the Dantokpa market in Cotonou. It thus appears that the use of protective equipment and the adoption of modern measures to prevent health risks by handlers during W3E treatments are becoming commonplace. From this perspective, the aim was to understand the rationale behind the acceptability of health risks during the treatment of waste electrical and electronic equipment (WEEE) in this category of actors, starting with the Cotonou sites. In this article, the socio-demographic profile, typologies and working conditions of the handlers will be described before presenting the socio-cultural factors that explain their attitude. In so doing, we shall see how the process of trivialisation of preventive practices and the acceptability of health risks appear to be a product of the socio-cultural environment and the national economic context of the emergence of this sector.

2- Materials and methods

The production of this article started with a quantitative public health survey and ended with an ethnographic survey to understand the logics of action among the handlers of W3E in Cotonou. The decision to conduct a small "ethnographic survey" in the course of a field survey is a temptation that many public health specialists have experienced at one time or another. However banal it may seem, this project is rarely implemented in the Beninese and sub-regional research universe, allowing an autonomous ethnographic approach to develop, as if its legitimacy were basically doubtful or poorly assured without the guidance of the proponents of the 'quantitative'. It has long been accepted in the African scientific world that this debate is outdated.

This study emerged from exchanges of results, experiences and perspectives as part of a research project under the NIH/IDRC-funded GEOHEALTH programme, following a six-year collaboration to assess health and environmental needs in the different countries¹ involved in this research on the handling of waste electrical and electronic equipment (WEEE) and health risks in West Africa. For reasons that should be discussed with those in charge of this research project, the possibility of using an ethnographic approach in the course of quantitative surveys on an issue, by asking people in the field questions about the issue, is not an option.

The socio-anthropologists, who were not initially associated with the project in any case, were offered the possibility of using an ethnographic approach in the course of quantitative surveys on a problematic, by asking the people they met in the field questions that were 'tailor-made' to understand what was at stake in the field. In any case, this collaboration was fruitful and ultimately made it possible to question the need to associate interventions on beliefs with measures to prevent the risks associated with WEEE.

This study, which is essentially qualitative, is therefore based on an ethnography of WEEE processing sites, handlers, equipment and

¹ This is an initiative involving Benin, Burkina Faso, Côte d'Ivoire, Mali and Senegal.

practices at certain sites in Cotonou. The production of this article thus intends to show the interest that there may be in integrating the ethnographic approach into the toolbox of public health specialists.

Concerning the approach itself, it consisted of an initial identification survey which enabled the identification and typology of WEEE handlers in order to make a reasoned choice of WEEE processing sites in Cotonou². At the end of this stage, the sites of Houeyiho, Sainte Rita, Agla and Akpakpa³ were selected. The focus was on simple dumping sites and dumping sites where burning is carried out. During four months of fieldwork, observations were made at the study sites. They were reinforced by semi-directive interviews and focus groups with 44 handlers, including 18 managers of the landfill sites (only 01 woman) and 34 workers (collectors, recyclers; repairers) of WEEE; and 10 residents of the WEEE treatment sites, including 06 men and 04 women. The study was descriptive and analytical in nature, and used interviews to reconstruct the various stages of waste processing activities, the different types of WEEE and the tools used by the handlers. The data obtained was processed and analysed using triangulation and cross-checking methods to understand the acceptability of the health risk.

3. Results and discussion

3.1. Trivialization of protective measures and equipment among WEEE handlers in Cotonou

Electrical and electronic equipment (EEE) consists mainly of computer equipment (computers, keyboards, mice, printers, etc.), screens,

² It should be noted that the sites are quite dynamic. During the survey carried out in 2019, 125 sites were identified. These sites included repair workshops and WEEE and scrap metal collection huts. Specifically for recyclers, we identified 10 major sites in Cotonou.

³ These are mainly popular neighbourhoods in Cotonou. The first is located in the vicinity of the "Cardinal Bernardin Gantin" International Airport; the second is a short distance from the General Mathieu Kérékou Friendship Stadium to the east and north of the RNIE1; the third is in the thirteenth arrondissement of Cotonou, which is at the western exit, and the last is at the eastern exit after the "Cotonou Lagoon", which is a channel or extension of Lake Nokoué at the mouth of the Atlantic Ocean.)

telephones, printer cartridges, neon lights and lamps, air conditioning systems, photovoltaic panels, etc. When they are no longer in use, they become waste electrical and electronic equipment, or WEEE. This waste is full of various recyclable materials (plastics, glass, ceramics, etc.), including ferrous metals and rare or precious metals (copper, gold, silver, palladium, platinum, etc.). It is also sometimes hazardous waste, composed of substances that are toxic to human health or harmful to the environment (various gases, arsenic, mercury, PCBs and brominated flame retardants, luminescent powders from screens, etc.). This waste has its own trade sector which attracts many handlers in poor countries like Benin.

Some components of WEEE are dangerous for the environment. Once used and if not collected and treated appropriately, they can cause emissions of heavy metals, PCBs or other gases. There are five main stages in the treatment of WEEE. These are collection of the equipment; reception on site, weighing, initial sorting of complete appliances by type; preparation, removal of electrical wiring; decontamination, complete dismantling by mechanical or manual operations to extract the recoverable materials; and sorting of the recovered materials for redirection to specific re-use channels. The dangerous nature of certain components makes it necessary to be constantly vigilant with regard to the risk of epidemics during processing. As a result, handlers are called upon to assess the risks of exposure to the risk; to implement preventive measures aimed at eliminating the risks at source; to reduce as far as possible the exposures that cannot be eliminated; and to adopt collective protection measures while wearing the protective equipment. In this regard, they acknowledge that they have some protective equipment thanks to the support of NGOs such as ADCSI-Benin (African Diaspora and Civil Society Initiative). Indeed, these organisations carried out their operation in 2019 according to the receivers of the protection kit donations on the sites in Cotonou, as witnessed by this respondent:

We received donations of protection kits from an NGO in 2019 at the advent of COVID-19; and the circumstances of receipt perplexed us to the point where we were afraid in the use of these protective items. This fear lies in the gift that is made at the time of Covid-19 when the spread of

the virus was leaving China. Meanwhile, these kits were marked Made in China. (H.C., Agla website)

Alongside the provision of the equipment, these NGOs have carried out awareness-raising campaigns aimed at the adoption of good practices during the processing of WEEE. Despite the awareness-raising carried out by the NGOs, the adoption of the measures and the use of the protective kits remain marginal on the sites. Repairers and recyclers are becoming more familiar with the effects of waste according to their category of work.

Discussions with the WEEE handlers on the sites revealed that they have a good knowledge of the health risks associated with their trade. They easily listed some of the illnesses to which they may be exposed. Among other things, they mentioned cancer, acute respiratory infections, bronchitis, etc. They are well aware of the consequences of their work, as they stated during a focus group « *We are aware that R22 gas is very toxic and penetrates directly into the lungs to cause cancer.* ». How then can it be understood that they do not adopt the recommended precautionary measures during treatment?

3.2 Socio-demographic characteristics of WEEE handlers

The assessment of socio-demographic characteristics allows us to understand the acceptability of health risks among this category of actors. The characteristics of the handlers are presented through the variables age, sex and level of education as well as their typology.

The ages of the handlers met at the Cotonou sites vary between 14 and 45 years, with an average of 27 years, which indicates that this informal sector is more likely to be made up of able-bodied workers. The current cohort of handlers is more likely to be "young adults". This age group, still today in the wake of Blos [12], faces a difficulty of internal maturation, which is reflected in their professional and social emotional life. They are not only called upon to detach themselves from relationships with original love objects [12], but also and at the same time called upon to

embark on new paths of self-realisation in relational and professional life.
[13]

In the culture of the fon and related groups, generally referred to as 'dɔ̀nkpevu', this phase is punctuated by rites of passage, tests of bravery and endurance, and the acquisition of wealth in order to prepare the individual to assume his or her full place in society. This already predisposes them to minimise and trivialise risk in its absolute form. One manipulator rightly expressed himself in these terms:

We (the handlers) have the strength and vigour to work and not to talk about risk, we are young and we will have to work to achieve our lives because no one will do it for us (V. A., Akpakpa site)

Moreover, before being handlers, they have already experienced the strength of work. Most of them have been apprentices as painters, refrigeration workers, mechanics, vulcanisers, rewinders and blacksmiths, as well as school dropouts used to working as labourers on road and building sites. With a relatively low level of education, handlers are less likely to acquire knowledge, assess the health risk of WEEE and develop an attitude or behaviour to prevent it. Of all the handlers who responded to the interviews, 14.29% had never been to school, 28.57% had not gone beyond primary school, 42.86% had completed lower secondary school (corresponding to 7th and 8th grades), and 8.57% had completed upper secondary school (corresponding to 9th and 10th grades). Only 5.71% had the baccalaureate, but did not complete their 1st degree level. Observation of this last category shows that they are more likely to adopt the rules of prevention.

Admittedly, the characteristics thus presented lead to a low assessment of the risk when handling WEEE, but there is only one element of exposure to health risk, with other contextual and behavioural factors largely contributing to the trivialisation of modern protective measures.

4. Socialisation of the WEEE work and related beliefs

4.1. Organization and working conditions of the W3E in Cotonou

The handlers' trade consists of collectors, recyclers and repairers. The **collectors** are responsible for buying objects called "gankpo gbléglé" literally called "iron scrap" or "scrap metal". They are young people who buy these objects and resell them on the dump sites. They often go in search of these 'gankpo gbléglé' with a ten thousand (10,000) CFA francs business and with their rickshaws, walking the streets of the neighbourhoods reciting 'gankpo gbléglé, gankpogbleglé' so as to be heard by the waste producers (the inhabitants), and searching the dumps and household and industrial waste dumps. Exposing themselves to bad weather and climatic hazards. Some site managers who buy WEEE products from vendors can be classified as collectors. It should be noted that almost all collectors carry out burning in order to extract the material to be delivered to recyclers.

The **recyclers** are those who strip the equipment and transform it into "waste sold according to standards". They are primarily collectors but work at the processing sites. They process the products on site to make them easily transportable and exportable. They also carry out burning. They are mostly from the forging, mechanical, plubing and electrical trades. Their handling of WEEE depends on their trade.

Repairers are those who often repair WEEE that can be used again. They are primarily recyclers, who after breaking and dismantling the collected equipment, sort out what can be reused after a little maintenance and repair. Once repaired, this used equipment is "resurrected" for a new use and sold to customers who buy from these sites. This includes refrigeration companies, rewinders, and repairers of televisions, radios, fans and windmills, etc.

In summary, recyclers and repairers often do dismantling and burning, as well as other activities that expose them to chemical toxins (gaseous and otherwise), while repairers do less risky work. Recyclers and repairers are prone to respiratory infections related to toxic chemicals. It

thus appears that exposure to health risks depends on the position of the handler. Indeed, recyclers and repairers are exposed to the effects of volatile substances when they are burned in waste collection centres, if we can call Cotonou's WEEE treatment sites that. As the waste collection centre is a place where bulky household waste or waste that can be recycled can be deposited, it is considered a collection point that guarantees depollution before reuse, which is not systematically the case at the WEEE treatment sites in Cotonou.

The working conditions on the treatment sites are archaic and primitive. They are characterised by work in disassembly "backyards", makeshift workshops and mostly unhealthy places, and the use of open-air acid basins to melt the micro-particles of precious metals contained in the electronic components, etc. [14]. The handling of WEEE without any protection or safety devices was observed, sometimes in the presence of carcinogenic fumes from incinerated materials (mainly plastics and insulating cables).

Generally, on the waste treatment sites in Cotonou, insalubrity and lack of personal hygiene reign. There is a "wild and primitive" management in the treatment of WEEE. The floor surfaces and working environment are covered with all kinds of used oil and other highly toxic chemicals, and the cleanliness of the workers is poor.



Plate 1: Site photos of some of Cotonou's landfill sites

Photo: taken in July 2021

In order to look after the products of WEEE processing, some site managers house young handlers in the said landfill sites. In doing so, they are subjected to health risks associated with this type of unhealthy,

dirty and unsafe environment. Several studies conducted in Guiyu, one of the villages in south-eastern China where these informal WEEE processing activities are concentrated, indicate levels of dioxins and furans in the air well above the thresholds defined by the World Health Organisation ([16], [17]). This often exposes workers to significant physical damage: respiratory and heart problems, damage to the brain, nervous system, intestines and kidneys, impact on the reproductive system (e.g. abortion in women living near landfills), etc. [14].

The maintenance of these working environments of the WEEE sector seems to be encouraged by cultural elements. Even though waste is beginning to be seen in Beninese societies as an economic resource, the qualification of 'waste' within the community still carries a negative connotation: what lies in the dustbin, what is destined to be abandoned in a corner of 'nature' or the environment, is waste. The place where waste is stored reflects a symbolic and cultural appropriation of a space that is characterised by dirtiness. Indeed, in the cultural representation of waste by the different actors, waste can be perceived as 'zukɔ', i.e. an object carrying a negative value whose disposal is entirely carried out without any real precaution; this is a potential vector of environmental and health problems experienced by these countries. Their exposure to these different substances present in the work environment constitutes factors of various respiratory, dermatological and ocular diseases. The failure to wear protective equipment (gloves, appropriate overalls, helmets, face masks) accentuates contamination by disease vectors. In all likelihood, the failure to comply with protective measures depends on the conditions and requirements for processing electrical and electronic equipment. This is encouraged by the form of organisation and the work system put in place by the site and activity managers who trivialise the institutional standards advocated by the support structures and NGOs involved in the implementation of protection and prevention measures in the workplace. It must be recognised that the informal nature of this sector also contributes to this, as do socio-cultural factors.

4.2. Beliefs associated with "iron" and WEEE treatment

The dominant religion in Benin is animism from the north to the south of the country, but the practice of syncretism seems to be the norm in terms of religion. The fact that a good part of the population admits to practising Christianity (Catholics, Protestants, including the numerous evangelical and revealed churches), Islam and Eastern religions does not mean much insofar as one can very well be both a Christian (or a Muslim) and effectively practise the voodoo cult. Here, the manifestation of religious syncretism lies in the fact that social actors, while declaring themselves to be followers of Christianity or Islam, continue to adhere to beliefs and to observe rituals that are part of endogenous and traditional practices.

It should be recalled that Benin is the cradle of Vodoun, a cult dedicated to a group of divinities present everywhere and in everything. Even if the North has its own religions, also animist but significantly different, the south of the country is the territory that saw the birth of Vodou. The Vodou gods form a rich pantheon of more than a hundred divinities, very organised, with its creator god of men and the universe, and a host of gods with diversified and precise attributions who are constantly solicited in daily and professional life.

Among these deities, one is dedicated to iron work. The Fɔ̀n and Yoruba and related socio-cultural groups in the southern part of the country regard iron, symbolised by a pile of iron, as one of the great deities of wealth.



Photo 1: View of the Gu deity in the backyard of a dump site in Akpakpa
Photo: taken in July 2021

Therefore, the Gu (Gu), God of Iron, has always been honoured among them. His representation can be found in the forges or in the houses of blacksmiths, hunters and ploughmen. The Gu is transverse and always receives his share of praise during ceremonies in honour of other deities, for without the knife that he makes possible, no sacrifice would be possible. He is also the protective spirit of the newly initiated, who are in the young adult category. He is the master of metals, a deity implored by all those who work with iron (blacksmiths, farmers, warriors, hunters, fishermen, etc.). It is therefore understandable that he is present on the W3E processing sites, which are largely made up of iron, lead and copper, which are classified as "Gankpo" work, literally called "gankpo si azo". Most site managers have installed an 'Altar of the Cult of Gu' in a corner of their workshop in order to be under its protection as well as all the handlers working on the sites. In fact, the Gu is a deity whose name is rather feared. Accidents (which are similar to the risk in the design of manipulators) linked to iron (including vehicles) are said to be the result of his anger. As a result, observing the prescriptions of the 'Guzo' (iron work), making sacrifices in honour of the Gu and imploring him, would protect and save them from misfortune, risk, illness and accidents related to iron work. According to them, those who develop certain respiratory diseases such as asthma at an early age would have transgressed the gods by their behaviour such as: "consciously usurping funds or swindling fellow workers, stealing from the site and having sex on the work site". It is these deviant behaviours that provoke the wrath of the iron god 'Gu', which translates into transgression of norms and exposes the author to health risks. Under these conditions, it is necessary to resort to traditional care rather than "white man's medicine" to get out of the situation, they say.

Such conceptions in the WEEE handler condition him to minimise the health risk when handling used equipment. In fact, these representations strongly influence the respect of known protection measures in the sense that their beliefs are more oriented towards these deities, which are part of their socio-cultural reality. It is therefore necessary to develop experimental protocols in order to deconstruct these kinds of prejudices

that are both in the representations of the risk related to D3E itself and determine its acceptability.

5. Social perceptions of the risks associated with handling WEE

5.1 Health risk linked to the treatment of WEEE, a remote risk....

For most of the handlers, the various diseases resulting from their profession do not appear immediately. They are all aware that our work has a risk on our health but it will happen in the evening of their career. Despite their knowledge of health risks, they trivialise protection measures because of the remote nature of health risks in their social perceptions. As the perception of risk represents a real independent tool for behavioural prediction ([17];[18]), it constitutes, in this case, an important point for understanding the acceptability of health risk during the treatment of WEEE.

Thus, in the perspective of a distant health risk, the use of self-medication and popular preventive care consisting of regular or temporary intake of "milk stings". As a result, recourse to medical care is relegated to the background. This preference is reinforced by the mythical view that the manipulators project on iron, which they consider to be sacred, leading them to a certain trivialisation of modern preventive measures and the low use of protective equipment. They project the health consequences of their practices into their old age. The health risk at this moment and for them, is in the order of the acceptability threshold. However, the notion of "risk acceptability threshold" must be understood differently depending on the type of WEEE and the type of handling to which it applies, as suggested by [19].

5.2 Perceptions of protective and preventive equipment

Discussions with the handlers revealed some of the prejudices and misrepresentations surrounding the use of protective equipment. The handlers said they felt uncomfortable using masks (nose masks) because they felt suffocated while working. Even though the working atmosphere on the sites is toxic, they feel that they should have some oxygen without wearing the mask.

Like the masks, the manipulators feel that most of the pro-protection equipment leads to behavioural and economic discomfort when doing a job. For some, the use of protective instruments slows down the progress of the work. For example, for a dismantling job that should take 02 hours, wearing gloves slows down the work, which can take a day; this in turn reduces the daily income. Almost all the handlers mentioned these arguments. Thus, the use of equipment immediately leads to a drastic reduction in daily income. Between the immediate risk of seeing their income fall and the distant health risk, the choice is crystal clear. They prefer not to protect themselves in order to make the most of their daily earnings. Especially as iron working is associated with the accumulation of wealth in popular discourse.

For others, the use of protective measures establishes a social distance between the manipulator and the "iron god". To benefit from the wealth generated by working iron, there has to be a permanent physical connection between the manipulator's body and the iron. Manipulators believe that they must be in direct contact with the protective 'GU' god. As a result, when their hand does not touch the iron during dismantling, there is a break in the relationship we have with the "iron god". For manipulators, to use protective equipment when working with iron would be to put up a barrier that augurs a spiritual estrangement from their protective god, which would be the cause of the discomfort, misfortune and/or illness. In addition, some manipulators have sold the protective equipment donated by NGOs, while others admit they have never used it. There are also nefarious practices, involving the consumption of alcohol, tobacco and other narcotics in order to give less thought to compliance with protective measures. This use of addictive substances turns them into "robots" and puts them in a professional automatism that favours profit over the prevention of health risks.

Beyond these representations and facts, the statements made by the handlers testify to a malaise and difficulties in the use of protective equipment and lead us to question the circumstances of handing over protective equipment to handlers. According to the handlers, the equipment was handed over only by raising awareness of the importance

and use of certain equipment. However, the apparent simplicity of some protective equipment should not lead to an underestimation of the efforts required for its proper use. Indeed, while some equipment is relatively simple (e.g. protective gloves and shoes), other materials (such as respiratory protective equipment) can be very complex or very difficult to use (e.g. nose plugs).

In a context where the difficulty of achieving effective personal protection is inherent in any risk reduction method based on modifying human behaviour rather than on protection built into the process at risk. Thus, it is important to accompany the provision of personal protective equipment with a personal protection programme comprising a number of elements. These include risk assessment, selection of protective equipment, adaptation of protective equipment, training and education, and maintenance and repair.

6. Logics of health risk acceptability among WEEE handlers

As shown above, the acceptability of health risks among handlers is based on a number of socio-cultural logics. There are logics of subsistence or survival that plunge these WEEE repairers and recyclers into immediacy. For them, the priority is first and foremost purchasing power and not the health effects, the probability of which is projected into the future. This leads to another logic of rent-seeking which puts the economy before health. As a result, despite the knowledge of the risks of diseases linked to the handling of WEEE, the main thing is to "make money".

This perception gives an instrumental character to their work and leads to the point that the acceptability of risks is also the product of a logic of production and physical efficiency which leads to the consumption of additives or alcohol or the non-use of protective measures. All the handlers interviewed mentioned that the intake of drugs, tobacco and alcohol stimulates and facilitates the exercise of their profession. This results in the mobilisation of drugs as a catalyst for work efficiency and income generation for the handlers, thus inhibiting their ability to analyse and evaluate the probability and seriousness of the health risk to which they are exposed in their work.

However, the acceptability of the health risk associated with WEEE does not depend solely on the logic of a restrictive and overly youthful vision of work. Even if this vision serves economic objectives, the perception of a non-immediate risk and the beliefs around iron fundamentally impose their own values and objectives on the WEEE sector. The fact of perceiving the health risk as remote is a lever that serves to take or better to trivialize the risk to the detriment of the economic rules of efficiency; while the beliefs around iron are also a vector of social behaviour and fulfill a role of training, direction and protection in the work on WEEE. Also for the handlers, to use protective equipment when working with iron would be to put up a barrier that would portend a spiritual estrangement from their patron god who would be the cause of discomfort, misfortune and/or disease.

As a result, there appears to be a logic of self-assertion among the workers in the D3E sector in the face of health risks. This is because power is at stake here, the power to decide for oneself or for others in a situation of uncertainty, which is a social attribution of risks [21].

However, even if each of these logics contributes independently to the process of trivialisation, it must be recognised that the acceptability of health risk comes from a combination of rationalities. Based on what the actors themselves say, and on the observation of their interactions, it can be said that the rationales in presence emerge as a cluster leading to the manifestation of acceptability behaviour. Highlighting the conditions and requirements for processing WEEE as well as the socio-demographic characteristics of the handlers is in fact an essential complement to the strictly instrumental vision of the work of the handlers. The acceptability of the health risk appears to be a demand, both at the level of the socio-cultural environment and in the national economic context of the development of this sector, which is dominated by the economic ratios of efficiency at the expense of less tangible but touching values, namely the well-being of citizens, which requires the prevention of environmental and health risks.

Hence. Furthermore, even if it is necessary to defend the idea of the logical impossibility of enclosing the process of risk acceptability in a

single logic and to support a pragmatic causal pluralism that is closer to the actors, it is essential to continue to reflect on the contribution of the legal and institutional frameworks for regulating environmental and health risks in Benin in the manifestation of this phenomenon

Conclusion

This research looked at the behaviour of actors in the electrical and electronic products sector in Cotonou and sought to analyse the reasons for the trivialisation of protective equipment, which in fact translates into an acceptance of the health risks associated with their job as WEEE handlers. In a context where the transfer of used electrical and electronic equipment from developed countries to developing countries has provided opportunities for the development of waste processing activities for these appliances, it is impossible to ignore the fact that the development of WEEE processing channels poses a certain number of environmental and health problems linked to the metal content of this waste. First of all, it raises the question of the health of the handlers and people living near the sites due to the concentration of persistent bioaccumulable toxic substances (barium, beryllium, cadmium, chromium, mercury, lead, etc.) before posing serious health and environmental problems for the population as a whole.

The importance of these health problems is primarily due to the characteristics, conditions and different types of work of the handlers, not forgetting the informal nature of this sector. In addition, there are socio-cultural factors that condition handlers to deal with the health risks associated with their work. These are motivated by economic, socio-cultural and environmental considerations. These findings raise questions about the strategies to be implemented to reduce the emergence of health problems, which are aggravated by the environmental problems raised by the primary management of WEEE. They lead to the question of whether, in addition to the installation and accessibility of protective equipment and devices, which play a very important role in the prevention policy, the approach should not include the organisation of individual protection programmes, which include

essential elements that can trigger a change in mentality and behaviour among poorly educated handlers.

This research leaves a number of questions open, including the mechanisms for setting up protective equipment and devices, and legal and institutional regulations. The understanding of these aspects could lead to the consideration of socio-cultural factors alone as producing the acceptability of the health risk or, better still, the trivialisation of preventive protection measures at work during the processing of WEEE in favour of less reassuring methods.

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