



Role of Communication in the Process of a Better Socio Sanitary and Environmental Supervision of Artisanal Dyeing and Textile Activity in Burkina Faso: Case of the Craft Industries of Arrondissement Number 6 in the Commune of Ouagadougou, Burkina Faso

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ABSTRACT

The current study was about the issue of the role that communication plays in the frame of a better organization of the socio-sanitary and environment sector of craft industry and textile in Burkina Faso, and which served the study object in arrondissement number 6 of the commune of Ouagadougou. This study aims at showing that the implementation of management mechanisms contributes to the use of efficient communication tools system. That one can help bringing up with a good organization in the processing chain of the dyeing activity, by protecting women and men working in the domain, and considering environment's protection and our living area.

Key words: Communication, Textile, Dyeing, Craft industry, Environment, Commune of Ouagadougou, Burkina Faso.

INTRODUCTION

West Africa, best white gold producer in Africa. More than 2.3 millions of tons of cotton-seeds are produced every year. Therefore, 95% of that production is destined for exportation without any added value, to the detriment of local transformation ((BOAD, 2015). For that production to better favor local economies, governments should raise the value chains. That's why, west African countries that produce cotton target to the development of industry and textile craft of which fabric spinning and weaving.

In Burkina Faso, this political will is expressed by the decree 2017-057 PM/CAB of the 29th November 2017 about hand-hoven fabric "Faso Dan Fani" promotion and value. The implementation of this decree exacerbated the passion of populations and fashion creators for the "Faso Dan Fani". From that moment, to meet the increasing demand, weavers regroup into cooperatives, associations or, individually, to work into the making of the fabric in big towns as Ouagadougou. The dyeing of the textile fiber is an important step in the process of hand hoven fabric "Faso Dan Fani" confection. For this, huge quantity of dye, most of it synthetic is used in the dyeing workshops. Indeed, according to Mansour and al. (2009), world synthetic dye production is estimated at 800 000 tons per year. 17% of that production is rejected into the environment during the dyeing steps of the textile fiber.

Therefore, those dyes are toxic for the human being and the environment considering their composition and their utilization modes. Indeed, the discharge of textile effluents without treatment is responsible of soil and available water resources (surface and underground water) pollution, the natural ecosystems' damage (Boeglin, 1999). For example, dyes are optic limiters that interfere in the light transmission into water, inhibiting the photosynthesis of aquatic plants (Willmott and al., 1998). Also, the dyes toxicity and their metabolism for the human being is not a recent fact. In 1895, a study had shown that the incidence of bladder cancer observed to some employees of the textile industry was due to a long exposition to dyes (Rehn, 1895). Recently, others studies, also confirmed that synthetic dyes are chemical substances, likely to induce carcinogenic manifestations into human being and the animal (Brown and Devito, 1993; Chen, 2006; Combes et Haveland, 1982; DEPA, 2000; IARC, 1982; Medvedev and al, 1988; Percy and al, 1989; Tsuda and al, 2000).

With regards to all those risks due to the handling of dyes in the dyeing process. The misinformation of dyers about the dyeing good practices increases the vulnerability of the populations' health, and environment. The contribution of behavior change communication of dyers becomes an emergency.

The objective of the current study is to contribute through communication, to the control of sanitary and environmental risks linked to the artisanal dyeing. It was specifically about (i) establishing a diagnosis of the knowledge, the attitudes and the dyers practices in their job, (ii) proposing a communication strategy in order to minimize the sanitary and environmental risks related to the artisanal dyeing.

METHODOLOGY

The study took place in arrondissement 6 of the commune of Ouagadougou in Burkina Faso, precisely in the Cissin and Kouritenga districts, located respectively in sectors 25 and 29. The study area covers an area of approximately 1,107 Ha. It is bounded to the north by arrondissement 1, to the south by arrondissement 7, to the east by arrondissement 12 and to the west by sectors 26 and 28 of arrondissement 6 of Ouagadougou (see figure 1).

Hydrographically, Cissin and Kouritenga districts are located in the watershed of the mogho naaba canal (7.1 km long), where the ground water rises in the rainy season (MHU, 2015). Ouagadougou Dam number 2 is the outlet of the mogho naaba Canal. Downstream of dam number 2 there is the dam number 3 and the Bangr-weogo urban park which provides a base for several protected species. Beyond the park, the course of the flow continues in the Massili which is one of the tributaries of the Nakambé River at 12 km from the city (Konaté, 2008).

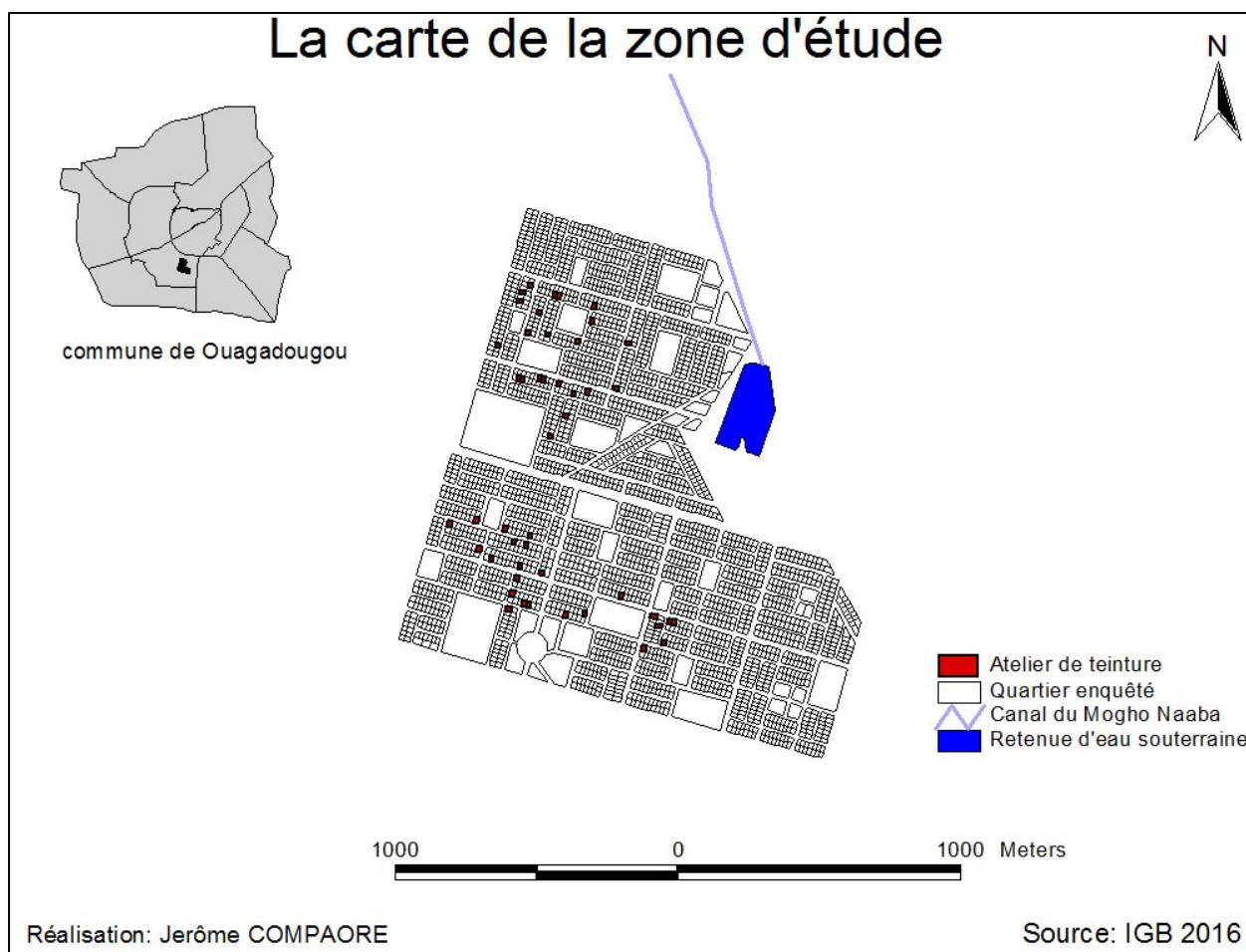


Figure 1: map of the study area

The socio-economic configuration of the study area mirrors that of the city of Ouagadougou. It presents a planned habitat with 97,359 inhabitants, 51% of whom are women; the average population density is 76 inhabitants/ha (INSD, 2012). The informal sector dominates the economic activity. Craft industry, including the making of hand-woven loincloths "Faso Dan Fani" is the main activity of most women; This is evidenced by the number of 348 and 179 weavers identified respectively in sectors 29 and 25 of arrondissement 6 (survey source). Notwithstanding the weaving of "Faso Dan Fani" fabrics, each weaver is a potential dyer. The step of dyeing the textile fibers is essential in the process of making "Faso Dan Fani". However, it should be noted that the family concession also serves as a dyeing and weaving workshop.

The assessment of the knowledge, skills and practices of the dyers linked to the health and environmental risks represented by their profession, was possible through interviews and observations in the field. The survey method consisted of a semi-structured interview between a surveyor and a respondent. During this exchange, the interviewer asks specific questions formulated in a pre-established order. The respondent must answer by choosing from among several answers presented to him or by making brief comments (Fenneteau, 2015). The simple random sampling (EAS) method enabled us to constitute a sample of 46 interlocutors for the interviews. The interlocutors were made up of actors involved in the artisanal dyeing industry, in particular weavers-dyers, sellers of dyeing reagents (dyes, caustic soda, hydrosulphite and calcium hypochlorite) and an association in the study area which accompanies the dyers. The

level of education, knowledge of the dangers associated with dyeing reagents and the appropriate communication channels to find out about them, the precautions taken to guard against the dangers, the management of dyeing effluents and the communication strategy adapted to better information about the risks associated with artisanal dyeing were the items addressed during the interviews.

The Sphinx software was very useful in carrying out this study; because it was used for the design of the collection tools, the processing and the analysis of the data.

RESULTS AND DISCUSSION

Knowledge of the dangers of artisanal dyeing for health and the environment

Dyeing reagents as a whole are toxic to humans and the environment due to their composition and the way they are used. Indeed, permanent exposure to dyeing reagents for the ennobling of textile fibers can lead to pathological manifestations in dyers. In particular through the inhalation of dust and gas or by skin contact during fiber dyeing operations. Thus, the appearance of acute or chronic respiratory pathologies (asthma), cancer of the urinary tract or lungs, conjunctivitis, skin allergy, etc., can be frequent among dyers (Mansour et al., 2009). In addition, most of the artisanal dyeing units visited do not have a wastewater treatment system. So, once discharged, these effluents contribute to the damage of the environment (surface and underground water, soils and even vegetation). However, even if the risk is real, are the dyers aware of the dangerousness of dyeing reagents?

In fact, only 61.7% of respondents said they were aware of the risks associated with handling dye reagents (Figure 2). However, there are disparities if we consider the level of education of the respondents. About 52% of those who affirmatively answered they know the dangers associated with dyeing reagents, have at least primary school education. This reminds once again that the level of education predisposes to less vulnerability to factors influencing health.

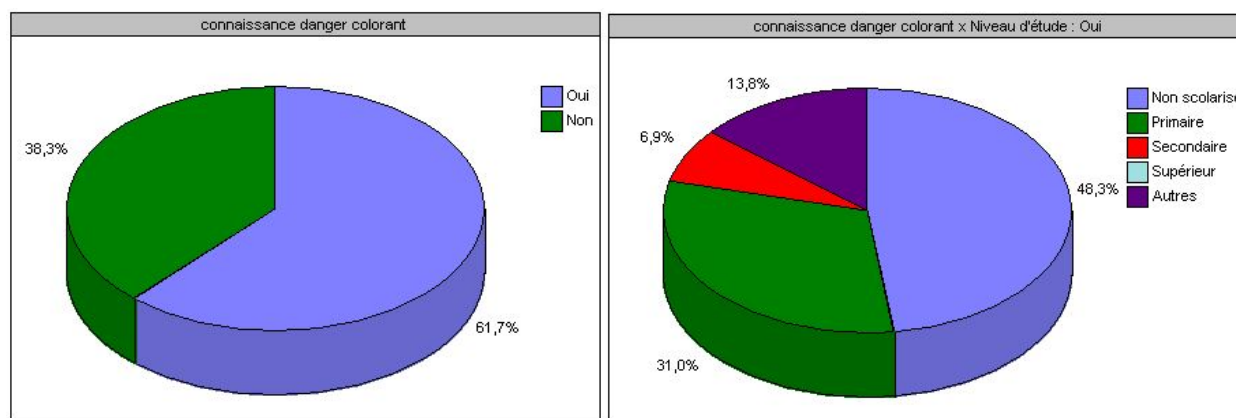


Figure 2: Knowledge about the dangers related to dyeing reagents

Moreover, the 38.3% of respondents, who say they are unaware of the risks linked to the handling of dyeing reagents, show that communication on the dangers of artisanal dyeing must be a prerequisite for any intervention in this sector. Indeed, if we ultimately want to control the professional and environmental risks associated with the dyeing, it will first be necessary to bring professionals in the field to become aware of the risks of their profession.

In addition, the health of dyers is most often threatened in their professional activity. Indeed, the majority of the respondents declared having presented at least once the signs of pathologies, which they believe to be linked to their professional activity.

Indeed, we observe in Figure 3 below that 35.3%, 32.9% and 23.5% of the respondents answered that they had had skin, respiratory and eye problems respectively during their professional activity.

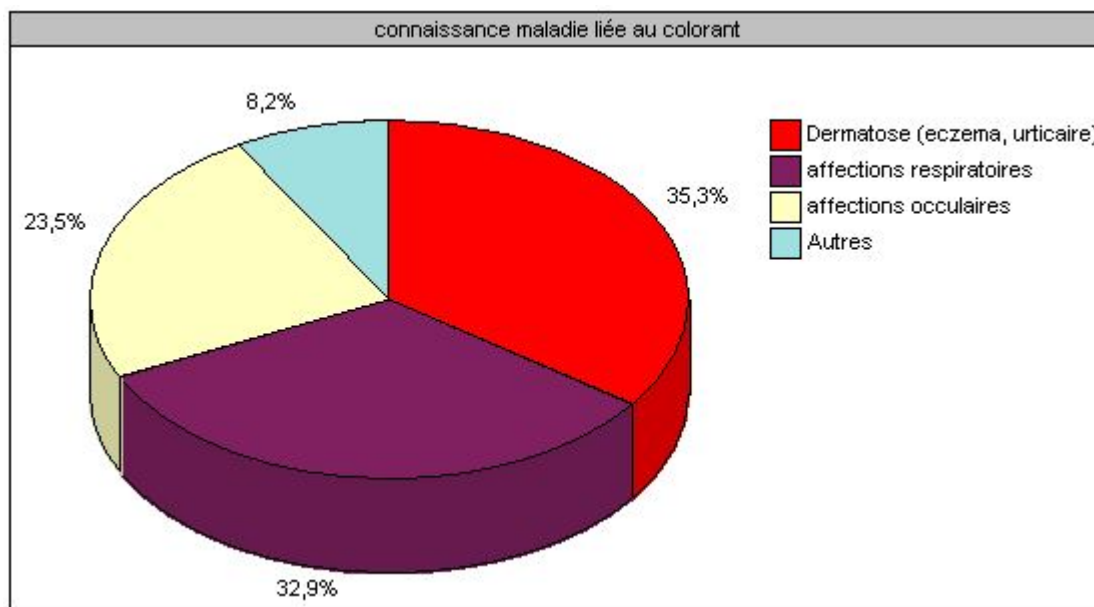


Figure 3: Pathological manifestations during the professional activity

The pathological manifestations declared by most of the respondents are due to the nature of the reagents and processes implemented in the dyeing of textile fibers. In fact, to dye yarns, the yarn is first bleached in a concentrated solution of chlorine, then rinsed and dried before the color ennobling stage. Then the dye solution is prepared with boiled water in which the powder of the desired color, caustic soda and sodium hydrosulphite are mixed. Finally, there is the step of immersing the yarns (see figure 3). However, caustic soda is very corrosive, contact with the skin causes burns. Sodium hydrosulphite and chlorine in solution cause gas fumes, the inhalation of which can cause respiratory problems (Kaboré, 2015).



Figure 4: reagent of the dye (a); dye preparation (b); yarns immersion(c)

With regard of the above, it is obvious that the pathologies reported are a reality among professionals in the traditional dyeing industry. On the other hand, to protect themselves, the dyers claim to wear 100% personal protective equipment (PPE) during yarn dyeing operations. However, it should be noted that the wearing of this PPE is limited to gloves filled with fresh water and unsuitable mufflers (see figure 4). Additionally, they claim to moisten their nostrils with shea butter, to minimize inhalation of dye and yarn dust.

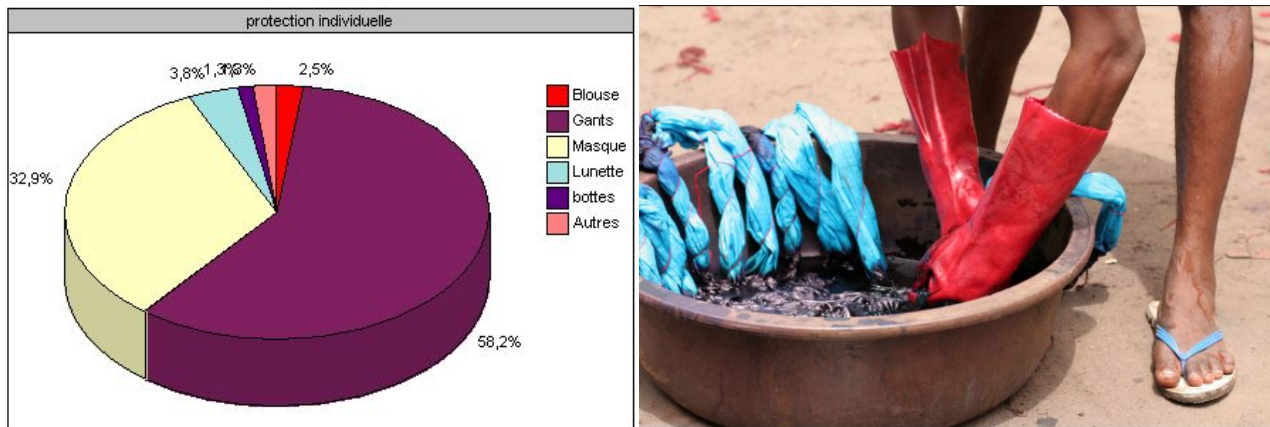


Figure 5: Wearing of personal protective equipment

These results show that the group of dyers, subject of the present study, are more worried about the immediate dangers of their profession and are unaware of those of the long term. This is why the wearing of masks and gloves, to protect against gas fumes and corrosive effects, is more frequent during dyeing operations. To the question of why they ignore the long-term damage of their activity on health; Madame Kouama, dyer in sector 29 answers us: « *I do not believe that the products we use are dangerous in the long term for health. Let me explain, during immersion, the yarns take on the color and the dye solution becomes almost clear. For me this means that this water is no longer dangerous. It can therefore be disposed of in nature without danger to human health. The proof is that this water is often drunk by our domestic animals (dog, sheep, hen...) without dying immediately. On the other hand, the danger of caustic soda for people is known to all. For example: we know that the skin burns on contact with this product. This is how a colleague, having left caustic soda powder within reach of her child, had a lot of sorrow when her child was hospitalized for serious burns to the mouth and throat due to this product. Fortunately, the child got away with it. But he still bears the consequences of this accident today: the child currently has difficulty swallowing anything.* »

Madame Kouama's response reflects the beliefs of most dyers and many people in the study area. They cannot conceive that a chemical product is dangerous to health, if the effects due to exposure to this product only manifest in the long term. In their conception, if one exposes oneself to what is dangerous one immediately suffers from it, otherwise it is not. This attitude of the dyers is known in many other fields, such as sanitation. Communities have hard to make the connection between the occurrence of diarrheal diseases and the practice of open defecation (DAL) (Bongartz et al, 2009).

It is in this regard that in the implementation of the Total Sanitation Approach Driven by the Community (CLTS), a communication strategy, the "triggering" promotes awareness raising and collective action in order to eradicate the DAL (Kamal, 2005).

Undoubtedly with communication, it is possible to modify the knowledge and practices of these dyers for the adoption of responsible behavior. But the communication strategy to be implemented must still be adapted to their specificity. Because the communication strategy used determines the level of involvement of the target in the risk prevention action by giving up harmful practices (Moussaoui and Clavel, 2007).

Beyond the danger of reagents and dye releases for health, what about the level of awareness of dyers on the pollution of the environment by their activity? Figure 6 below illustrates the proportion of dyers who believe that the pollution of certain environmental compartments is due to their discharge.

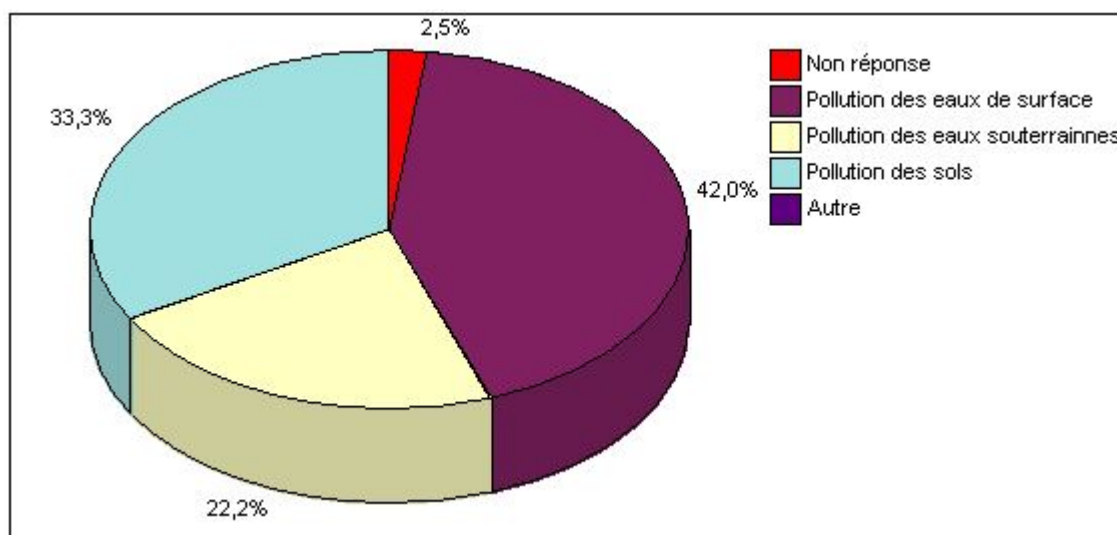


Figure 6: Awareness raising of the dyers about environment pollution due to their discharge

The results show that the dyers in the study area are aware of the risk that their activity represents for the environment. Indeed, 42.2%, 33.3% and 22.2% of the dyers believe that dye discharges can lead respectively to the pollution of surface water, groundwater or soil. To better illustrate the level of awareness of dyers in the study area, we have considered the words of Mrs. DERRA, weaver-dyer in sector 25: *"the dirty water from dye, which we evacuate without any precautions, is dangerous for the plants and animals living in the waterways. For example, where I used to throw my dirty water after each dyeing operation, in the past, during the rainy season, grass grew there; but now there is no more greenery at this time of year. To me, that means the ground is dead there; reason why nothing grows there anymore."* Indeed, Mrs. DERRA's remarks are well-founded. Because chemical pollution destroys the structure of the soil, thus disrupting the circulation of water and nutrients essential to plants (Sou, 2009). This observation is positive, in the sense that the level of awareness of the dyers on the dangers for the environment is satisfactory.

This could be an asset for all communication actions on the preservation of the environment, towards the dyers of the study area.

Damage prevention to people and the environment

As soon as a considered risk is deemed unacceptable, it goes without saying that everything is done to reduce its probability of occurrence or the severity of damage to potential targets. Very often, risk control consists of the use of security barriers, technical devices or organizational tools that contribute to the reduction of said risk.

Indeed, the actors of the artisanal dyeing carry out communication actions against the health and environmental risks of their profession. However, are these measures sufficient and adapted to the socio-cultural context of the study area? In order to elucidate this question, it was necessary to evaluate the effectiveness of the existing communication device and practices in the management of liquid waste.

In the artisanal dyeing sector in Ouagadougou, several actors are involved in the risk control process through communication. The channels used to relay information are diverse and varied. Indeed, Figure 7 below illustrates the main channels used in the study area to share information on good practices in artisanal dyeing.

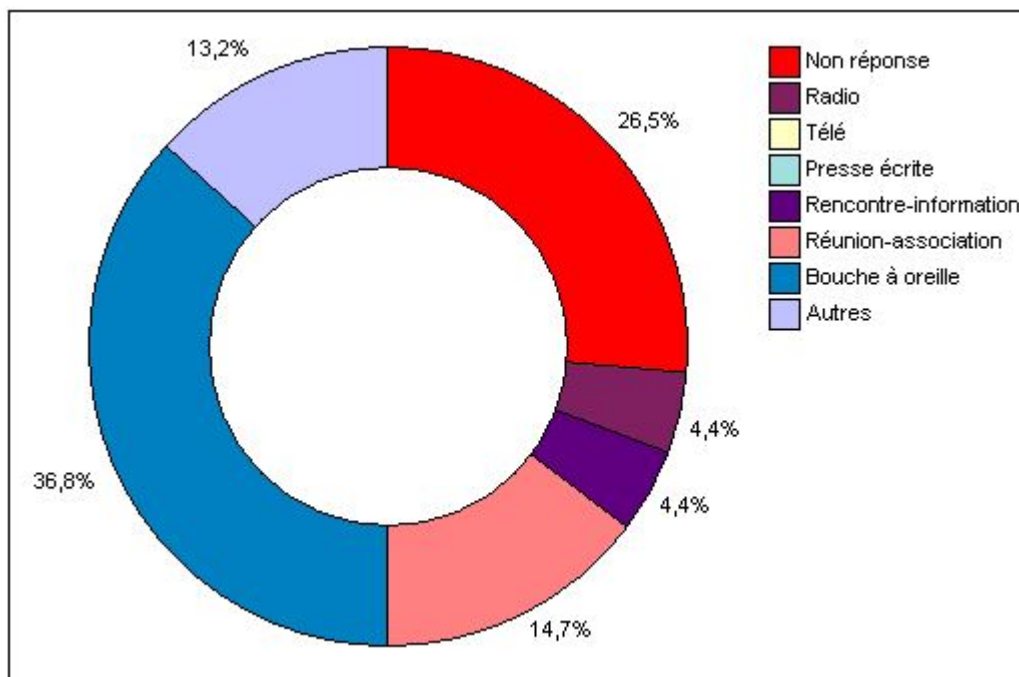


Figure 7: Main communication channels used in the study area

The 26.5% non-response represents the proportion of dyers who declared that they were not aware of the dangers linked to their profession. So, the question regarding the channel through which they were sensitized, was groundless. However, more than 73% of dyers are made aware of the dangers associated with artisanal dyeing. Which is positive by the way. In addition, the results of the study show that "word-of-mouth" is the preferred channel for sharing information in the artisanal dyeing industry in nearly 37% of cases. "Word of mouth" is followed by the awareness channel in the associative framework and by unusual awareness channels (witnesses of damage to people or the environment), respectively in 14.7% and 13.2 % of cases. In view of these results, word of mouth would be of paramount importance in the context of an

action to raise awareness of good practices. Indeed, word of mouth has a determinant influence on the behavior of the individual within a group, a community or a society (Moulins and Roux, 2008). However, the message broadcasted must be consistent with said channel and the target, if we hope to obtain a positive effect on behavior (Capelli and al., 2012).

However, the more authorized channels such as TV, radio and the written press come in last position of the channels used to disseminate information in the middle of the dyers. This denotes, on the one hand, an insufficiency in the implementation of policies in this sector, which, in the best of cases, risk management should be a priority; on the other hand, unfavorable socio-economic conditions. Indeed, the study revealed a relatively low level of study of the dyers (figure 8). This limits the use of the written press as a source of information.

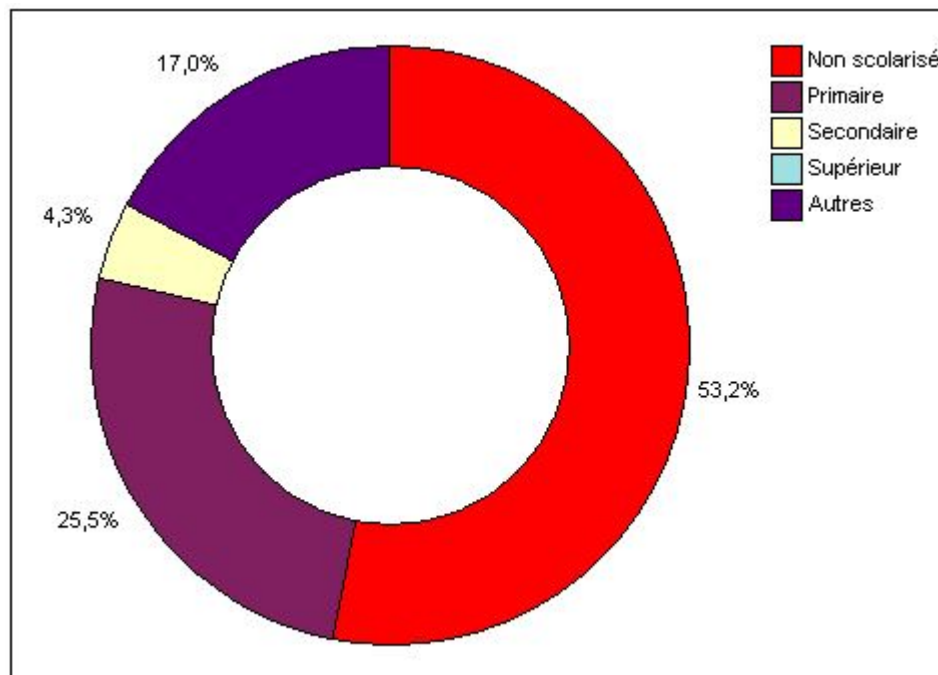


Figure 8: Level of alphabetization of dyers in the study area

In addition, the electrification rate of the study area is also relatively low compared to the rate in urban areas. So, it goes without saying that there is a correlation between the use of receivers such as TV or radio to get information and the electrification of a given area. In view of the above, any communication strategy to be implemented should take into account the socio-economic context of the area. That is to say, the channels, the content of the messages and the target should be coherent.

From the results of the survey, the dyers are fully aware of the pollution of the different compartments (water resources, soil and air) of the environment due to their activity. But what about practices for managing discharges from their activity?

To provide an answer to this question, in addition to interviews, field observations during the dyeing operations were carried out. It appears from this investigation that there is a paradox

between the level of knowledge of the dyers on the dangers for the environment and their practices in the management of dyeing wastewater.

Indeed, according to Figure 9 below, this phenomenon is well illustrated in the study area.



Figure 9: Discharge area of wastewater from the artisanal dyeing of the study area

The results show that the most common place of evacuation is the street in 62.5% of cases. What are described as other places of discharge in 30.4% of cases are in reality the family latrines, the interior of the family courtyard and pits fitted out for the pre-collection of effluents. Obviously, this situation is deplorable, because most of the dyeing workshops surveyed do not apply any treatment to the effluents before discharge into the places mentioned above (see Figure 10). As for the cases of treatment mentioned, it is a question of recycling colored water for processes of the same color, or the emptying of pits for the pre-collection of effluents. Vacuum trucks are used, and the contents of the pits are transported to treatment and purification stations in the city of Ouagadougou. However, it should be noted that these stations have been sized to receive biodegradable effluents. The addition of textile effluent (non-biodegradable) could disrupt the operation of these stations.

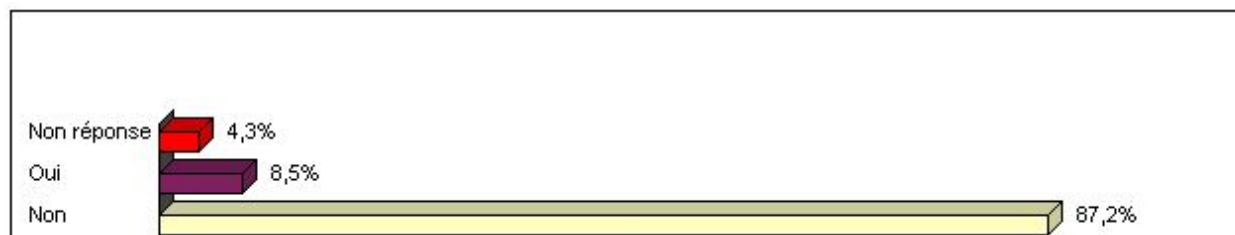


Figure 10: existence of treatment before the discharge of effluents

In addition, these practices exacerbate vulnerability to pollution of water resources and accentuate the transfer of pollutants to protected areas. Indeed, the study area is located in a watershed drained by the Mogho Naaba canal, where the groundwater rises in the rainy season (see Figure 11). This hydrogeological context of the area commands the urgency of undertaking communication actions towards the dyers of the area, in order to preserve water resources and by extension the health of the populations.



Figure 11: vulnerability map of water resources in the study area

Communication strategy to minimize the risks associated with the artisanal dyeing

The risks associated with artisanal dyeing designate all the practices likely to generate damage to health and the environment. Hence the need to put in place an awareness strategy, so that the people held responsible for these risks adopt good behavior. However, the success of an awareness-raising process requires diligence in dealing with a certain number of questions. What risky behaviors should be abandoned or changed? Who is involved in this change to be made? What channels or tools should be used to reach the target of this approach?

In the case study, the diagnosis made it possible to identify two levels of risky practices: practices related to the use of personal protective equipment and practices related to the management of textile effluents.

Regarding the stakeholders for the establishment of a communication strategy, the study revealed that there are three target groups. The role of each target group is decisive in the process of change in the dyeing industry in Ouagadougou. The primary or priority target group is that made up of dyers, from whom risky behavior is observed. Associations or groups of women, sellers of dyeing reagents and weaving yarns as well as traders of “Faso Dan Fani” loincloths constitute the secondary target group here. The secondary target group is the one capable of influencing or facilitating the evolution of the practices observed in the priority

group. The third category of stakeholder is the tertiary target group which includes all opinion leaders within the community (political, customary and religious authorities, elders and cultural promoters). The latter have an influence on beliefs and are excellent relays of awareness.

All communication is a process in which there is an exchange of information between a sender and a receiver. For these exchanges to be, there needs to be a coherent channel. The communication channels raised, namely radio, TV, the written press, community information managers and word of mouth, have been more or less effective in informing dyers of the risks of their profession. In addition, in the opinion of the dyers surveyed, mobile telephony through its messaging service and social networks (facebook, whatsapp, social networks, etc.) could be potential channels as part of a communication strategy. However, for an effective communication strategy, it will be necessary to ensure a certain coherence between the target audience, the channel and the message to be conveyed.

CONCLUSION

In short, this study, which the objective is to contribute through communication to the control of the risks associated with the artisanal dyeing, has made it possible to draw a certain number of conclusions. The results show that the majority of respondents are aware of the real danger of dyeing reagents for their health and that of others. They also know that the evacuation of textile effluents without any precaution can be the source of the pollution of water resources and soils and the disturbance of aquatic ecosystems.

However, very few dyers in the study area wear full personal protective equipment during yarn dyeing operations. Also, many of them discharge their effluents into the street without any prior treatment. As a result, communication actions on good practices in the field of artisanal dyeing are implemented by certain actors in the field. But these actions remain insufficient.

In addition, the diagnosis made by this study will serve as a basis for any communication action in favor of the preservation of health and the environment with regard to the risks of artisanal dyeing. Moreover, most of the weavers surveyed recommend the selling of already dyed weaving yarns on the market at prices that are affordable to them. Indeed, the dyeing of weaving yarns at the industrial level reduces the health and environmental risk for the preservation of the population and the different compartments of our environment.

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