

PRODUCING IN COMPLIANCE WITH ENVIRONMENTAL OBLIGATION: CASE OF BEDELE BREWERY

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ABSTRACT

The Ethiopian environmental laws have provided different environmental regulation mechanisms for different types of industrial sectors based on their gravity of impact to the environment. Breweries are also subject to such regulation mechanisms according to environmental laws. This paper focuses on study of Bedele brewery with the intent to examine whether it is producing in compliance with the Ethiopian environmental laws. In line with this objective, different Ethiopian environmental laws, together with the data gathered through interview, field observation, and different literature related with the topic are examined. The cumulative result shows that the effluent that is released from the factory is causing some problem on farm land and its products. However, in order to create causal link between this effluent and its impact on the farm land and its products, it needs scientific study or laboratory test both on farm land and the product on the one hand, and the effluent itself on the other hand. Hence, the author of this paper recommends that it is better if the concerned government organs conduct further study through scientific methods or through laboratory test with the intent to give long lasting solution to the problem.

1. INTRODUCTION

The Ethiopian environmental laws provide for different environmental regulation mechanism for different types of industrial sectors based on their gravity of impact to the environment. Brewery is one of such industrial sectors that is subjected to environmental regulation according to environmental laws. This paper specifically focuses on the study of Bedele brewery. In line with this objective, it examined different Ethiopian environmental laws together with data gathered through interview, field observation, and different literature related with the topic.

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Structurally, it is organized into five sections. The first section provides for a succinct introduction to the paper. The second section deals with Environmental Standards for Industrial Pollution Control by the Federal Environmental Protection Authority together with data gathered through interview, field observation and different literature related with the section. The third section addresses Protection of Industrial Pollution Control Regulation No.159/2008 together with data gathered through interview and different literature related with the section. The fourth section analyzes Environmental Pollution Control Proclamation No.300/2002 together with the data gathered through interview. Finally, the fifth section provides conclusions and recommendations.

2. PROTECTION OF ENVIRONMENTAL STANDARDS FOR INDUSTRIAL POLLUTION CONTROL BY THE FEDERAL ENVIRONMENTAL PROTECTION AUTHORITY

Brewery wastes are generated in liquid, gaseous, and solid form. The liquid form of waste generated from brewery consists of waste water or effluent obtained from washing raw materials, cleaning of tanks, bottles, machines and floors. These effluents also originate from disposal of solid waste products.² Solid waste mainly consists of residuals from the process including spent grains and hops, sludge, surplus yeast, label sludge, Kieselguhr, powdered carbon and broken glass. Other solid wastes from a brewery are glass cutlets from the packaging area, Kieselguhr from the filtration process, paper pulp from the bottle washer, paper, and plastic from received auxiliary material (especially packaging materials), waste oil and grease, etc.³

Untreated brewery effluents are known to have organic components (expressed as BOD5) mainly consisting of sugars, soluble starch, ethanol, volatile fatty acids and so on. It also contains high chemical oxygen demand (expressed as COD) and high level of PH (acid) such as caustic soda,

²A. O. Odior, F. A. Oyawale and P. E. Amiolemhen, *Industrial Waste Management in a Brewing Industry in Benin City of Nigeria*, Journal of Engineering and Applied Sciences (2011), Volume 3, P.17

³Tesfalem Fikresilasie, *Impact of Brewery Effluent on River Water Quality: The Case of Meta Abo Brewery Factory and Finchewa River in Sebeta, Ethiopia*, Addis Ababa, University of Addis Ababa(2011), p.5.

phosphoric acid, nitric acid, ammonia and so on.⁴ If this untreated effluent is released to the environment, it creates serious problem to the environment.⁵

In order to preserve the environment, the Federal Environmental Protection Authority, issued environmental standard in 2003 to discharge limits for industrial effluents before they are released to the environment. According to this standard, the breweries waste water limit values for discharges to the environment like any other industrial effluents are provided as follows:

Limit Values for Discharges to Water

Parameter Limit Value

Temperature	40 °C
PH	6 – 9
BOD5 at 20°C	90% removal or 60 mg/l, whichever is less
COD	90% removal or 250 mg/l, whichever is less
Suspended solids	50 mg/l
Total ammonia (as N)	20 mg/l
Total nitrogen (as N)	80% removal or 40 mg/l, whichever is less
Total phosphorus (as P)	80% removal or 5 mg/l, whichever is less
Oils, fats, and grease	15 mg/l
Mineral oils at the oil trap or interceptor	20mg/l

The above diagram shows the limit value of the effluent that can be released to the environment. This means any effluent that is released to the environment in excess to the limit values stipulated in the diagram is considered as dangerous to the environment and punishable under the law.

A field observation by the author shows that this factory releases the effluent through pump to the nearby small river. The farmers around the factory use this river for irrigation. For the question that is provided to them concerning

⁴*Id*, Pp 6-7.

⁵*Ibid*.

the impact of this effluent on their health, products and farm land, they answered that it has no impact until a recent period. However, this effluent began to affect their land and products starting from a recent period.⁶

The interview conducted with Mr. Meles Asfaw, a worker in the factory on whether the released effluent is in compliance with the standard limit of the Federal Environmental Protection Authority, he answered positively without doubt.⁷ But, the author's field observation and interview conducted with the farmers showed the existence of complaint on the factory. Mr. Meles Asfaw did not deny the truth and stated that the factory is now improving or upgrading its production system in a more modernized and environmentally friendly manner which by its nature presupposes cleaning and changing the tank. As a result of this, it is releasing untreated effluent to the surrounding although it is for a short period of time. That is why such problems are happening according to him.⁸ For the question that is provided to him on how much maximum period the establishments of new tank will take, he answered that he has not any knowledge about it.

Taking the above information both from the factory and the farmers, the author has visited the agricultural expert of the kebele to ask whether this effluent has any effect on the farm land and products.⁹ The interviewee

⁶The farmers have said that they have been using this effluent for different purposes such as for irrigation and drinking their domestic animals starting from its establishment. Until a recent time (before 1 year), the effluent is treated one and it has no impact on their irrigation product and animals according to the farmers. However, they have said that the situation is changed since a recent time (before a year). According to them, untreated effluent which is released with high content of acid began to burn their product and crack their land. For example, they have shown the author different burned product and different cracked lands as a result of acidic content in the effluent to support their assertion. In this regard, the author conducted interview with Mr. Asrat Itafa, Farmer, Bedele, 6 May 2015; Mr. Tamesgen Itafa, Farmer, Bedele, 6 May 2015; Mr. Tadesse Gamta, Farmer, Bedele, 6 May 2015; Mr. Asafa Burayu, Farmer, Bedele, 7 May 2015; Mr. Tesfaye Itafa, Farmer, Bedele, 10 May 2015; Mr. Abdu Hussein, Farmer, Bedele, 9 May 2015; Misses Assagadu Jamana, Farmer, Bedele, 9 May 2015; Mr. Mansur Abdu, Farmer, Bedele, 10 May 2015; Mr. Nagasa Gamtessa, Farmer, Bedele, 10 May 2015

⁷Interview with Mr. Meles Asfaw, Technical Manager, Bedele Brewery Factory, Bedele, 11 May 2015

⁸For the question that the author raised to Mr. Meles Asfaw on what the factory is doing to minimize this problem until that time, he answered that the factory is only diluting the effluent by using large amount of water. That is why it becomes ineffective according to him (Ibid).

⁹Mr. Galata Tamiru, Agricultural Expert at Sidisa Kebele, Land and Environmental Protection Office, Bedele, 15 May 2015

replied by saying in order to say it has such effect, it requires scientific study /laboratory/ test. He also replied by saying since we have not made any laboratory test on the effects of this effluent on the farm land and products, he cannot say anything about it as an expert of agriculture. Regarding to the question that is provided to him on complaint of the society about its effect on their products and land, he says many society complained to him on that but since it requires scientific study, he referred them to the Bedele Woreda Investment Office seeking to initiate to conduct laboratory test both on the effluent and its impact on the soil and products. Depending on this information, the author has visited the Bedele Woreda Investment Office to know whether they have entertained such complaint from the societies. However, the office has answered by saying we have not appointed any worker on investment sector for more than a year and no one can give you reliable information on that.¹⁰

Besides the above fact, the author has visited Bedele Woreda Land and Environmental Protection Office to know whether they have any knowledge about this fact. In this regard, the author has made interview with Mr. Malkamu Bulcha.¹¹For the question that is provided to him on this regard, he said, after you have made the interview with the society I have also visited the farmer around that factory and I have made some interview with some of them for the office consumption.¹² The farmers I have made interviews with answered that the effluent is causing damage both to their land and products. Further, he explained that although it requires laboratory test to handle peoples' complaint, it is somehow difficult to ascertain the allegation since there is no laboratory to test the composition of this effluent in Bedele town. However, he informed his office many times to make laboratory test on this effluent by taking the sample to Jimma town in order to take precaution although he did not get any response yet.

He also said that regarding soil study, there is laboratory here in Bedele that can study the soil and he has provided many times the question to his office to conduct such soil study on that land in order to avoid the impact of the

¹⁰Interview with Mr. Namarra Namomsa, Deputy Mayor, Bedele Town Administration, 16 May 2015.

¹¹Interview with Mr. Malkamu Bulcha, Environmental Concern, Bedele Woreda Land and Environmental Protection Office, Bedele, 30 May 2015.

¹²I have made the interview with Mr. Malkamu Bulcha staying some days after I have made interview with the farmer.

effluent by taking precautionary measure. Also he did not get any response for that. Indeed he said, in order to contribute some of his effort to help the farmers, he has guided some of the farmers to bring a written complaint containing signature on the effect of this effluent in order to discuss the situation with the factory. However, they did not provide him with this complaint until now and he is still waiting for them. Finally, Mr. Malkamu Bulcha put his opinion by saying that he thinks all these problems are happening because of the expansion of the product of the factory following its transfer to private ownership.

In relation to the above interviews, the author has obtained another source that is related with the issue under the section. That is - assessment report made by International Organization for Standardization (herein after referred as ISO) on the factory. This organization has made assessment in 26 - 27 May 2014 which is very close to the time when this study has been conducted. According to the report, the ISO has identified many gaps regarding the waste management system of the factory. Some of the identified gaps are: waste water treatment plant input, process and output is not adequately managed; gas emission from burning of waste papers (in incinerator) and vehicles are not adequately managed; used oil is not adequately managed etc...In order to improve and fill the identified gaps, the ISO recommended some solutions to the factory through its report.¹³

Breweries do not discharge air pollutants other than some odors.¹⁴ Concerning to the odor that comes from this effluent, the farmers and other community around the factory with whom the author has made interview unanimously answered about its disturbance. However, they have stated that it happens randomly.¹⁵ During this period the farmers have said that they

¹³This document falls on the hand of the author together with other documents received from the factory in soft copy. The one who gave this document to the author wanted to remain anonymous.

¹⁴Multilateral Investment Guarantee Agency Environmental Guidelines for Breweries (2015), available at www.miga.org/.../Breweries, p.330 <accessed on May 10, 2015>.

¹⁵ According to their answer, this odor comes randomly within two months interval by estimation. However, when it comes it remains for more than a week. They have said during this period living around the factory becomes difficult. In this regard, for example, I made interview with Misses Asnakech Chali, Resident, Bedele, 7 May 2015; Mr. Wayyessa Marga, Farmer, Bedele, 8 May 2015; Waqine Gamta, Resident, Bedele, 8 May 2015; Misses Ijigayo Ayyele, Resident, Bedele, 9 May 2015; Mr. Tesfaye Itafa, Farmer, Bedele, 11 May

were exposed to high headache and colds (cough). During the production process when the beer is filtered, solid waste products like surplus yeast and Kieselguhr remain under the bottom of tank. When the tank is opened for cleaning, this accumulated waste product is released out to the society with other water mixed effluents. As a result of this, high amount of odor occurs.¹⁶

Based on the information from the society and the factory, the researcher has made journey to Bedele Town Administration Health Office to know whether they have any information on what is happening to the society and if not, to know what precaution mechanism they have made to avoid the possible health problem that may arise from this effluent. For this question, the office head, Mr. Kamal Mohammed said, we have established committee as a town which is known by the name Town Sanitation and Beautification Committee (*yeketema tsidatinna wubet committee*) composed of many members from different sectors and our office health service and production work inspectors known as environmental concern is a member of this committee. Through such committee, we quarterly assess the environmental impact of the factory. Finally, he said that for detail information contact our Health Service and Production Work Inspectors Head by the name Mr. Meseret Abbiyyu¹⁷.

Accordingly, Mr. Meseret Abbiyyu said, in order to prevent environmental impact of this factory, we work based on - *Food, Medicine and Health Care Administration and Control Proclamation No.661/2009*.¹⁸ Mr. Meseret Abbiyyu goes on saying it is around one year from now that people complain the factory that it is releasing untreated effluent to the river thereby suffering the societies around the factory. Through Town Sanitation and Beautification Committee (*yeketema tsidatinna wubet committee*), we have

2015; Abdulqadir Ahmed, Merchant, Bedele, 11 May 2015; Mr. Tamesgen Ittafa, Farmer, Bedele, 6 May 2015

¹⁶ We are improving or upgrading our production system and when this activity is finalized there is no surplus yeast or Kieselguhr that is released out to the society with the effluent. Instead, we use it as a fertilizer and animal feed that is sold which in turn generates additional income to the factory. At this juncture, no bad odor found. Interview Mr. Duri Hussein, Maintenance Manager, Bedele Brewery Factory, Bedele, 15 May 2015

¹⁷ Interview with Mr. Kamal Mohammed, Head of Health Office, Bedele Town Health Office, Bedele, 29 May 2015

¹⁸ Interview with Mr. Meseret Abbiyyu, Health Service and Production Work Inspectors Head, Bedele Town Health Office, Bedele, 29 May 2015

made assessment and stopped the factory from releasing untreated effluent that the people complained about. Even we wanted to punish the factory. However, the Town Administrator of the time prohibited us from taking such measure on the ground that it affects the good name of the factory that is generating high income for the country.¹⁹ As a result of this, we are forced to oblige the factory only to release the effluent to the limited standard by the laws. We also warned the factory to minimize the limit of odor. Furthermore, he said, we have seen many environmentally unfriendly production systems during our inspection at different times. The followings are some of the problems he mentioned:

- We have seen during the assessment period that they have no standardized hole to burn some solid waste product. We warned them through letter to dig the standardized hole within two month and to notify us the result. However, they did not respond to us on the result until now. This event is now around a year.
- They only send a small portion of broken bottle for the recycling and throw the remaining part here and there both inside and outside the factory compound. Since the broken bottles are dangerous to the environment, we warned them to avoid this conduct although they did not respond to us on the result until now. This event is now around a year.
- They provide the spent grain (*furushka*) for animal feed to help the community. However, they dump it on the main road, near resident house, near government office, and near educational institutions in the town. When the rainfalls, this spent grain creates bad odor to the environment thereby preventing the residents to have and to live in beautiful and suitable town. For this reason, we have warned the factory to dump this spent grain to specified place prepared for this purpose. But, the situation is still continuing. The administration organ is also reluctant to take measure on the factory on the ground that it is

¹⁹ The author asked him about the then Town Administrator. However, he was not willing to explain for the security reasons.

important to the poor society-those engaged on breeding the livestock for their livelihood.

Taking the above information from Mr. Meseret Abbiyyu, the author has made a journey to the Head of Town Sanitation and Beautification Committee (*yeketema tsidatinna wubet committee alafi*), Mr. Habtamu Wagga to verify the obtained evidence. Supporting Mr. Meseret's view on the issue, Mr. Habtamu Wagga replied as follows: *For a question that we have provided to them based on the public complain, the factory responds by saying that we are improving the standard of the factory with the intent to modernize it and that is why these problems are happening. They also tell us that they are diluting the effluent by adding high amount of water in order to reduce its impact until the new machines are established. For the warning we gave them, they promised us to finish establishing the new machine within two months and notifying us the result in writing although they did not do that. Also, we did not visit them after that time and it is now around a year. For this reason, I have no any information personally on what is happening now. Finally, Mr. Habtamu Wagga puts his opinion by saying that he thinks all these problems are happening as a result of the expansion of the factory's product following its transfer to private ownership.*

3. PROTECTION OF INDUSTRIAL POLLUTION CONTROL REGULATION NO.159/2008

This regulation is issued pursuant to Environmental Pollution Control Proclamation No.300/2002. Its main objective is to give effective implementation to this Proclamation. Accordingly, one of the obligations of a factory that is provided under article 4(2) of this regulation is the obligation to handle equipments, inputs, and products in a manner that prevents damage to the environment, and to human and animal health. The factory thinks that it has no problem as far as application of such provision is concerned.²⁰ However, the ISO report shows that different chemicals (ammonia gas, acetylene gas, caustic soda, etc) are handled in the same store (constructed

²⁰ Interview with Mr.Meles Asfaw, *Supra* note 7.

from sheet metal wall and roof) without adequate space and ventilation in a way that may bring harm to the environment and human beings.²¹

Article 8 of the regulation obliges any factory to prepare and implement an emergency response system and to notify the competent environmental organ. The interview conducted with Mr. Meles Asfaw regarding the application of this provision revealed that the factory is fully implementing the provision.²² However, in contradiction with the information that was obtained through the interview, the ISO report reported as follows:

*Procedure for emergency preparedness and response has not been reviewed, communicated to relevant sites and implemented; identification of emergency situations and response planning has not been adequately done.*²³

Article 9 of the regulation obliges any factory to prepare and implement its own internal environmental monitoring system. Interview conducted with one of the workers in the factory regarding the application of this provision revealed that the factory is fully implementing it.²⁴ However, in contradiction with the information that is obtained through interview, the ISO report provides the following:-

“the depot and agent activities for product distribution have not been clearly defined in the scope of the environmental management system of the company; environmental policy of the company has not been reviewed and communicated to all stakeholders; procedure to identify environmental aspects of the company’s activities, products and services has not been reviewed, communicated to relevant sites and implemented; environmental aspects and impacts of operations of the brewery are not identified and documented; environmental objectives, targets and programs are not established; resources required for effective implementation of the environmental management system (e.g. time, waste water treatment plant, chemical store, etc) have not been adequately identified and provided; Procedure to identify training needs with

²¹ Documents, *Supra* note 13.

²² Interview with Mr. Meles Asfaw, *Supra* note 7.

²³ Documents, *Supra* note 13.

²⁴ Interview with Mr. Meles Asfaw, *Supra* note 7.

*regard to environment performance of the company has not been implemented; training needs associated with environmental aspects and their management have not been adequately identified and planned; employees awareness regarding significant environmental impacts associated with their respective operations (e.g., chemical store, CO₂ and ammonia generation, etc) has not been conducted; mechanisms to communicate information with regard to environmental aspects and their management has not been reviewed, communicated to relevant sites and implemented; documents necessary to ensure effective planning, operation and control of processes that relate to significant environmental impacts(e.g. waste water treatment procedure, transportation) have not been reviewed, communicated to relevant sites and implemented; procedure to control environmental management system documents has not been communicated to relevant sites and implemented; methods needed for effective control of operations (chemical handling, waste management, etc) have not been reviewed, communicated to relevant sites and implemented; procedures for dealing with actual and potential environmental non-conformities and for taking corrective and preventive actions have not been reviewed, communicated to relevant sites and implemented; procedure for the identification, storage, protection, retrieval, retention and disposal of environmental management system records has not been implemented to control environmental management system records; program(s) and procedures for periodic environmental management system audits to periodically evaluate effectiveness of the Environmental Management System has not been reviewed, communicated to relevant sites and implemented. Finally, the report finalized its gap identification report by concluding that review of environmental management system that is needed to ensure continuing suitability, adequacy and effectiveness of the system has not been conducted”.*²⁵

Article 11 of the regulation obliges every factory to keep written information describing the pollutant it has generated and a disposal mechanism it has used to dispose of the pollutant and other related matter. The regulation also

²⁵The document at *Supra* note 13.

obliges the submission to the competent environmental authority an annual report describing how it is complying with the provision of the regulation. In order to know the compliance of the factory with this provision, the author posed a question to Mr. Meles Asfaw. He answered that the factory has no as such grave pollutant which it has generated and hence has no recorded information.²⁶ Concerning the question as to whether the factory is submitting an annual report describing how it is complying with the provision of this regulation to the competent environmental authority, he answered negatively.²⁷

4. PROTECTION OF ENVIRONMENTAL POLLUTION CONTROL PROCLAMATION NO.300/2002

Article 7 of the proclamation says environmental inspectors that are established under Ministry of Environment, Forest and Climate Change ensure compliance with environmental standards and related requirements of the factory. The author has made interview with the factory on whether these inspectors come and the effect of their non-arrival on conducting their work according to the environmental laws. The interviewee replied that although he has been working in the factory for more than two years, no one comes for the purpose. Their inspection has no value on us to observe the laws because this factory is sold to Heineken Company, one of the biggest multinational companies. It has its own environmental standard that fits international environmental standard. Furthermore, he replied, since it is internationally competent multinational company, it protects the environment and works for its own repute.²⁸

Finally, in order to minimize the environmental effect of waste generated from brewery factory, conducting the following waste minimization process is recommended²⁹: using water for recycling in order to minimize both water consumption and the content of waste in the water, sending broken glass and bottles that cannot be used to recycling, using spent grain for livestock feed,

²⁶Interview with Mr. Meles Asfaw, *Supra* note 7.

²⁷ Interview with Mr. Meles Asfaw, *Supra* note 7.

²⁸Interview with Mr. Meles Asfaw, *Supra* note 7.

²⁹Reducing Waste in Beer Production(2011), available at www.alfalaval.com/about-us/press/.../reduced-waste.aspx, Pp.1-3, <accessed on May 9, 2015>.

using surplus yeast to filter it since it has some amount of beer and using the spent one to fertilizer and animal feed, burning label sludge, etc...

The author made interview with Mr.Tewelde Asfaw whether the factory has been applying the above waste minimization system. He replied that the factory is only applying some of the above system. According to him, the factory is using spent grain for animal feed, broken glass and bottles for recycling and burning label sludge. According to him, using the remaining waste minimization process is on the ways since it is installing new machine. In other words, this is to mean that water is not recycled and waste product such as surplus yeast is released with other effluents until such installations are installed.³⁰

5. CONCLUSIONS AND RECOMMENDATIONS

The overall assessment of the study reveals the following. The interview with a society shows that the effluent from a factory has no effect both on their land and products. However, it starts to affect their land and product beginning from a recent period. The odor exists all the year round although it happens randomly.

Regarding to the conversation with the factory on whether it is operating according to the environmental laws, the interviewees answered positively for all the questions provided to them. However, they did not deny the fact that they are not operating according to the laws at this time for the reason that they are improving the standard of the factory. But, they have no answer for a question like for how long does the situation continue. Also they have no answer for a question like what scientific mechanism they are using now to minimize the harm until that time.

As it is also understood from the interview with government officials, the reason for non-compliance to the laws by the name of upgrading the standards were answered by the factory to these government officials before a year. The factory also promised them to finish the upgrading work and to notify them within specified period. But, it was a mere promise as the factory

³⁰Interview with Mr.Tewelde Asfaw, General Manager, Bedele Brewery Factory, Bedele, 10 May 2015.

did not do that. The findings of gap identification report by ISO and the interview conducted with the factory do also contradict each other.

Based on the above findings, it can be concluded that the factory is not producing according to environmentally friendly manner. However, in order to become more certain and to create causal link between this effluent and its impact on the farm land and product, it requires further practical investigation. That is to say, in order to ascertain the impact of this effluent on the farm land and products as it is asserted by the farmers, it needs scientific study or laboratory test both on farm land and the product on the one hand, and the effluent itself on the other hand. Hence, it is better if the concerned government organs conduct further study through scientific methods or through laboratory test with the intent to give long lasting solution for the problem.