



# INTERNATIONAL WATERS EXPERIENCE NOTES

## Preparation of a Pollution Abatement Plan for Poultry Georgia



**Abstract:** Poultry Georgia is a large scale poultry producer in Georgia. It was identified by the Ministry of Environment and Agriculture as a significant polluter in the Kura River Basin. The ministry was in the process of requiring the company to construct a wastewater treatment facility, and asked for the projects assistance in developing appropriate implementation measures as part of the Kura II project.

The project proposed developing a pollution abatement plan, focusing initially on the implementation of cleaner production techniques to reduce pollution, and then developing plans for the treatment of the residual wastewater stream.

The pollution abatement plan developed includes 17 measures for improvements in water use efficiency and pollution reduction. Implementation of the plan is projected to achieve a 27% reduction in water consumption at the facility. Critically the measures will reduce the volume and load of wastewater to be treated in the proposed wastewater treatment plant by 30%, reducing the capital expenditure required for its construction and ongoing operational costs.

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# Preparation of a Pollution Abatement Plan for Poultry Georgia

Experience of the GEF - sponsored

## UNDP GEF/IW: Kura II: Advancing IWRM across the Kura river basin through implementation of the transboundary agreed actions and national plans GEF- ID: 5325

### PROJECT DESCRIPTION

The Kura II Project was developed to address the priority needs in the ministerially endorsed Strategic Action Plan (SAP) through implementation of the SAP and national Integrated Water Resources Management Plans to strengthen and harmonize coordinated conjunctive transboundary ground and surface water management. It comprised five components: Support for institutional governance protocols; professional development and capacity building for water managers across sectors; stress reduction measures in critical areas; stakeholder education and empowerment; and, enhanced science for governance.

This work was undertaken under Output 1.4 of the project the objectives of which were as follows:

*Azerbaijan and Georgia have benefited from multiple projects on water quality monitoring in the past 15 years. There is high awareness of challenges at the local national and transboundary level and it is now time to take action towards abating point source pollution, where possible. This output is designed to support the countries to develop pollution abatement plans (PAP) and environmental compliance action plans (CAP) for pollution abatement in line with international best practices, including the EU WFD, and best available technologies. This will include the EU WFD pressure-impact analyses, and risk assessment guidelines, and support the implementation of EU WFD compliant Program of Measures. Compliance will be based on a combination of both positive incentives and punitive measures to improve water conditions in the Kura basin.*

### THE EXPERIENCE

#### Issue

Untreated wastewater emissions from the industrial sector were identified as a key source of pollution of the Kura River. The Ministry of Environment and Agriculture in Georgia had identified Poultry Georgia as a significant polluter to the Kura River Basin.

Poultry Georgia is an agricultural company mainly involved in broiler meat and egg production. The company operates a production site near Tbilisi where several production activities are carried out. Current annual production capacity is 820 t of fresh broiler meat and 80,000,000 eggs. The main activities include: egg production, rearing of chicks for broiler production, rearing of broilers, animal feed production and slaughterhouse.

When the project commenced Poultry Georgia discharged untreated wastewater from its facility to the Kura river Basin, and the Ministry were in the process of taking enforcement action against the company to mandate the instillation of a wastewater treatment facility.

The Ministry were interested in the Pollution Abatement Plan approach proposed by the project and identified Poultry Georgia as a possible candidate for its application. The company agreed to participate in the project and agreed to develop a Pollution Abatement Plan with the assistance of the project.

## Addressing the Issue

In order to develop Pollution Abatement Plan for Poultry Georgia a detailed environmental assessment was conducted within UNDP GEF Kura II project during period October 2019 – March 2020. The assessment included a resource efficiency (cleaner production) assessment, an assessment of best available techniques (BAT) and a benchmarking analysis. The entire site was assessed during the audit including all production activities. The development of the pollution abatement plan for the company focused mainly on the slaughterhouse as this is the activity where the largest volume of wastewater and pollution load is generated and is the primary source of wastewater discharged directly to the recipient without treatment.

The resource efficiency assessment was based on UNIDO Cleaner production methodology, and was undertaken by the International Expert during two extensive audits of the facility. These audits also included sampling and analysis of priority process waste streams undertaken by Local Environmental Consultants.

In order to analyze the performance of the slaughterhouse in more detail, a benchmarking study was undertaken. The facility's production related water consumption indicator was compared to average and peak industry values in order to identify possibilities for improvements and quantify potential for reduction of water consumption. The facility's key metrics including production and consumption data were also analyzed.

A best available techniques (BAT) assessment was undertaken to identify areas within the production process on site can where improvements could be made. The BAT Reference documents on best available techniques produced by the European Commission were used as a reference source and only BATs related to water (consumption, wastewater generation and quality) and applicable to the size of installations in Georgia were considered. A BAT assessment matrix developed for Kura II project was used for the detailed audit of the slaughterhouse.

On foot of the audits and analyses undertaken, a pre-feasibility study was developed which detailed technical efficiency measures, aimed at reducing water consumption, pollution prevention and pollution abatement. As one of the key environmental issue is high organic load in the wastewater, a preliminary design of a wastewater treatment plant (WWTP) was developed to address this issue.

Potential financial benefits associated with the implementation of the proposed improvement measures were estimated taking into account all costs associated with extraction, use and discharge of water. Further economic assessment included cost-benefit analysis to identify the main drivers for the PAP economic viability and to determine the approach that minimizes implementation cost.

In order to select the most effective sequence for the implementation of proposed measures, a comparative ranking analysis was used to prioritize opportunities for implementation. The highest priority was given to measures that reduce water consumption and have low cost. Based on the results obtained from an analysis of the specific requirements for the measures established through pre-feasibility study and results of the cost-benefit analysis, a final implementation sequence and timeline for the PAP were developed.

The proposed pollution abatement plan was developed leading to the design and construction of WWTP, as the final and the most expensive step in pollution abatement. All preventive measures which result in pollution reduction and reduction of effluent volume were given priority, in particular low cost measures. Emphasis was also placed on the need for dedicated measures for the monitoring and measurements of water consumption within in the facility. This is a proven strategy to reduce water consumption and in turn the volume of wastewater generated.

## **RESULTS AND LEARNING**

### **Summary of work and outputs**

The proposed PAP for Poultry Georgia is devised as a detailed step-by-step guideline for the company to reduce water pollution. The PAP developed and the approach undertaken in its development can and should be used as a template and an example of good environmental practice for the food sector.

In general, the sector can benefit from implementation of resource efficiency measures and best available techniques. The lack of a proper wastewater treatment, poor monitoring of water consumption and accurate measurement of water flow and pollution load are some of the key problems in the sector. Based on the estimates from the PAP, implementation of resource efficiency measures can reduce the overall water consumption in a slaughterhouse and reduce volume of wastewater that requires treatment by 20-30%. Similarly, a significant reduction of pollution load can be expected from implementation of pollution prevention measures, for example, the collection of blood and its separate disposal, which can reduce the organic load in the wastewater by 50% (up to 40% lower BOD and 60% COD). In adopting this approach, it is recommended that the design and construction of a WWTP is undertaken in a multi-staged approach where possible, to allow sufficient time for optimization of water consumption/wastewater generation in the plant.

The cost-benefit analysis has shown that implementation cost is the main driver for the PAP economic viability and that implementation of the PAP is justified on economic grounds only if implementation costs are minimized. Therefore, when developing the pollution abatement plans, all measures aimed at reduction in water consumption and wastewater generation should be frontloaded as far as is practicable in advance of the final and the most expensive step, the construction of the wastewater treatment plant. A staged approach that minimizes implementation cost and gives priority to the implementation of preventative measures, while improving the available data on wastewater flow and load to provide for proper sizing of the WWTP, should be adopted. The implementation timeframe will need to be agreed with the regulator, however according to the project findings an implementation period of approximately two years, divided into three phases, may be sufficient.

## **REPLICATION**

The critical criteria for the replication of this approach is the buy in and support of the Environmental Regulator and of the Company for which the Pollution Abatement Plan is being developed. As the plan will generally be developed outside of existing legislative frameworks both participants must be prepared to move forward with the initiative in a spirit of cooperation.

It must be recognized that this approach is a learning experience for both sides aimed at developing and an economically viable and environmentally effective plan which will benefit both parties.

It is important also that the company have access to experts on cleaner production that can assist with developing the pollution abatement plan. A sampling and monitoring capability is required for quantification of pollution loads both in process and for final discharges. In addition, the availability of local experts that can provide information on market costings are critical for completion of the economic analysis.

## **SIGNIFICANCE**

The development and use of a Pollution Abatement Plan represents a sustainable tool set that can be effectively applied in the regulation of industry. Its focus on the reduction of pollution at source and the application of clean production techniques aims to move the industrial base to a more resource and cost efficient model, in line with our overall sustainability goals.

The approach focuses the regulatory model on sustainability, rather than compliance at any cost. It also embeds the concept of the use of best available technologies in industry through out the process cycle and not solely related to abatement techniques.

## REFERENCES

<https://kura-river.org>

## KEYWORDS

- ◆ Cleaner production
- ◆ Water efficiency
- ◆ Industrial regulation
- ◆ Best Available Techniques

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