Manure management on industrial pig-farms in the Baltic Sea catchment area of Belarus

Eugeniy Lobanov
Center of Environmental Solutions,
Coalition Clean Baltic partner in Belarus

Kolobrzeg
23rd of June 2010

Industrial pig farm in Grodno region

Overview of the situation

- Around 2.7 mln of pigs;
- Up to 80% is produced on large industrial pig farms.
- 107 large-scale industrial pig farms:
- 3 on 108 000 places;
- 9 on 54 000 places,
- 43 on 24 000 – 27 000 places,
- 52 on 12 000 places.
- All farms are state-owned;

Location of pig farms in Belarus

Typical pictures

Typical pictures

Environmental and legal regulations

- The legislation of Belarus considers animal farms and complexes as objects that potentially can cause considerable harm to the environment, and, especially, water objects.
- Sanitary protection zones;
- Subject to obligatory EIA procedure.

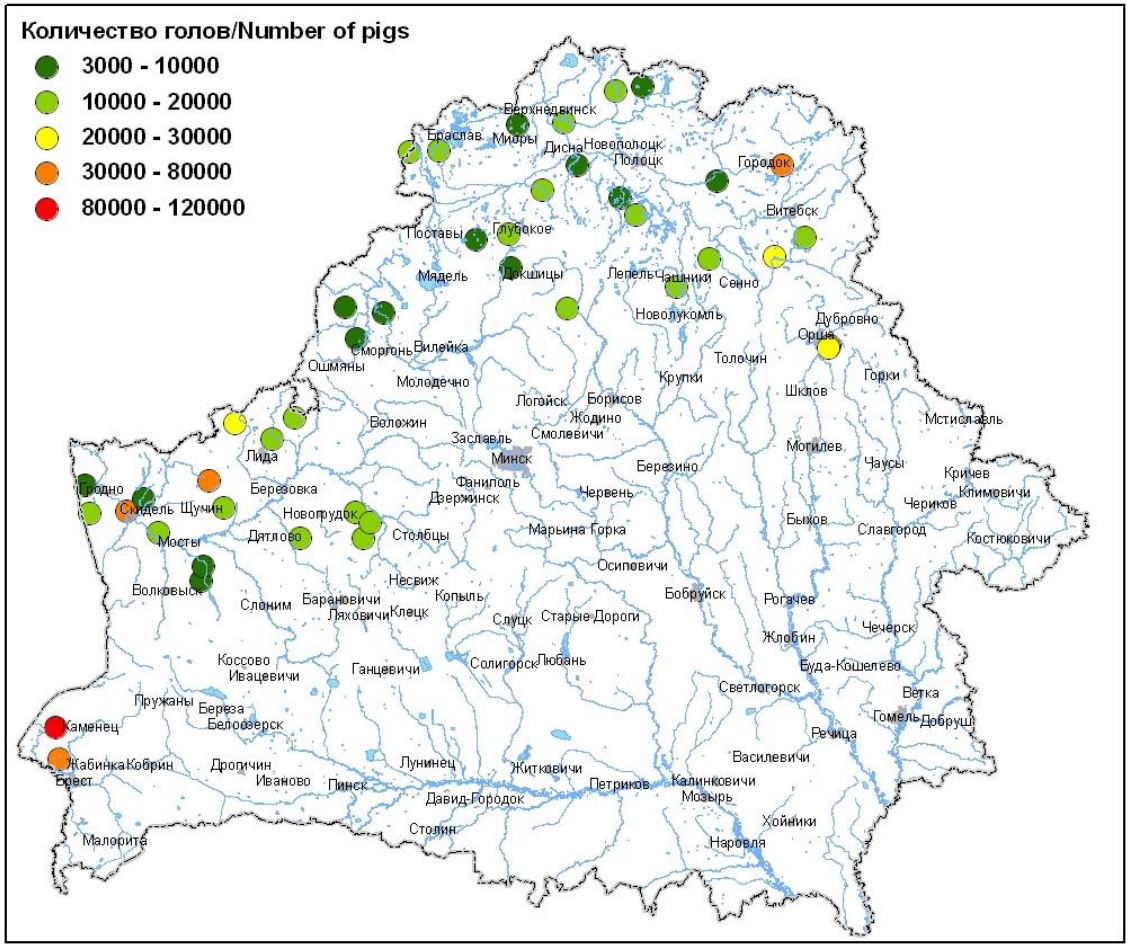
Impact on water resources

- 20-22 mln tones of wastewater and manure annually;

Impact on water resources

Manure utilization technologies are not fully in line with strict requirements of environmental protection;

Industrial pig farms in the Baltic Sea catchment area in Belarus



BS catchment area of Vitebsk region

21 large-scale industrial pig farms:

- 1 farm on 54000 pigs;
- 8 farms on 24000 pigs;
- 4 farms on 12000 pigs and less;
- 8 farms with 3000-7000 pigs and less.

BS catchment area of Grodno region

21 large-scale industrial pig farms:

- 1 farm on 54000 pigs (around 48000 pigs at present moment);
- 17 farms on 24000 pigs;
- 10 on 12000 pigs and less;

BS catchment area of Brest region

21 large-scale industrial pig farms:

- 1 farm on 108000 pigs;
- 2 farms on 54000 pigs (78 000 on one of them at present moment)
- 2 farms on 24000 pigs;

Applied manure utilization technologies

Different methods of manure and wastewater utilization and management: from direct placing on fields to complicated processes with biogas production;

1st type

1. The manure is mowed away with water wash technology and goes to reception reservoir-neutralizer, and then to quarantine reservoirs. Usually, there are 3 such reservoirs on a farm. In each of them the manure is stored for 6 days, and then goes to separators in order to separate liquid and solid manure. Liquid manure goes to vertical sedimentation tanks, and after sedimentation, clarified liquid manure goes to storage ponds. Storage ponds are designed to store liquid manure, further used for watering, for the period of several months. Finally, liquid manure goes to fields through a system of sprinkling-machines. Solid manure is added to fields as usual litter manure.

Solid manure clamp in the field near the pig farm, Grodno region

Type 2

1. Second scheme is used on industrial farms with mechanical method of mowing away manure. Semi-liquid manure (humidity 90-92%) goes to reception reservoir-neutralizer, and then to quarantine reservoirs. After quarantine period (6 days), the manure goes to sedimentation tanks for further separation on fractions. Clarified liquid manure is transported to field reservoirs by pipeline system or mobile transport. After 3-6 month of storage period effluents are used for irrigation or watering.

Transportation of liquid manure to the field, Vitebsk region

Type 3

- Third type of manure treatment technology includes biological treatment, when the manure is mowed away with water wash technology, separated into liquid and solid fractions, and liquid fraction goes through aeration process. Finally, the active mud from aerated liquid fraction is separated and biologically-treated liquid goes for further usage on fields.

Construction of biogas units on the pig farm "Zapadnyi"

Problems

- Sometimes due to the problems with waste treatment equipment or absence of clear fertilization plan, liquid manure from pig farms can go directly to fields;
- Quite high costs, involved into transportation of clarified liquid manure by mobile transport into fields;
- Environmental impact of many pig farms is quite significant, especially of those, which remove their liquid manure to the fields by mobile transport or with outdated reservoirs system;
- Majority of pig farms don’t have observation holes in or around their agricultural fields of irrigation.
- Also majority of pig farms do not have possibility to control the quality of clarified liquid manure, which goes to irrigation of fields.

Emergency cases

According to information of the regional structures of Ministry of the Environment in recent years, there were almost no emergency cases with manure treatment facilities, when waste water from reservoirs was able to reach natural water objects…

Conclusions

- There are several large scale pig-farms which have effective systems of manure management and utilization, including biogas reactors, biological cleaning, and bioengineering constructions, which allow to minimize the negative environmental impact of manure;
- There are quite many pig farms with significant negative environmental impact on the environment;
- There is no exact data available on pig farms on actual run-off of phosphor and nitrogen elements.

Conclusions

- General situation with manure management on most of industrial large-scale pig farms in the Baltic Sea catchment part of Belarus requires urgent attention from relevant governmental bodies;
- The situation with local environmental monitoring requires impovement as only a few pig farms have necessary capacity for monitoring themselves;
- Manure treatment systems on majority of plants are outdated and requires repairing and updating;

Recommendations

- To organize detailed inventory of the situation with manure management on pig farms;
- To consider introducing of environmental permits, to be renewed on regular basis;
- To follow Helcom Annex III, to keep and control the limits 25 kg P/ha, 170 kg N/ha.
- To consider the Helcom Baltic Sea Action Plan (Eutrophication segment) as a voluntary guidance document to address the problems of nitrogen and phosphorous run off from the industrial pig farms;
- To promote installation of biogas production technologies on large-scale industrial pig farms;
- For EU: to ensure funding possibility of infrastructural projects with clear environmental benefits to be implemented on industrial pig farms in Belarus;

Thank you very much!

E-mail: lobanow@gmail.com

Ph: +375 29 658 74 45

Ph/Fax: +375 17 334 53 23

www.ccb.se

www.greenconsumerism.org