

Environmental challenges meets practical solutions: GIS involving civil society to take action



Background

Lacking environmental awareness and responsibility, every-day consumption behavior everyday leaves its marks in our pristine nature. Various state institutions are setup to be responsible to deal with environmental challenges by setting up environmental legislation framework, enforcing its implementation and taking prevention actions. However the attempts of the public sector may not be very effective without active integration of civil society to take real actions contributing to better environmental status.

In Lithuania such civil society integration into environmental management has been so far very limited due to: 1) state authorities encouragement of public participation is limited mostly via official legal procedures being very formal rather non-integrative of general, not specialized citizen; 2) after Soviet Union regime, civil society behavior as a whole due to number of reasons is still rather passive. Understanding that for effective environmental management and responsible behavior direct public participation is crucial in order to make change in these processes, non-governmental organization Baltic environmental forum (BEF) on 2008 has started innovating initiative involving new IT opportunities. At its start, the key-ambition was focused on how to create simply-to-use opportunity for every citizen to take practical action to improve environmental status, which delivers practical results and personal satisfaction of everyone participating by observing real change and receiving direct feedback. As soon as citizen recognizes that his efforts resulted real change and changes environmental problems on a bigger scale - it encourages the believe that everyone can make a change and contribute for our nature benefit.

On the way from the idea to action, JSC "Hnit-Baltic" (www.hnit-baltic.lt) has joined with its project www.maps.lt made based on ESRI technologies. The www.maps.lt interactive maps services are being used by app. 25 000 citizens every day, thus it was excellent opportunity to create environmental component to it.

Concept of the idea

The www.maps.lt provides detailed and interactive maps additionally offering ortophoto based and mixed layers, which on the national scale is the most popular source for everyone to find particular address, spot or plan traveling route. As a separate tool it provides environmental service for society to spot and report about observed environmental problem, which its solution process is further moderated by BEF.

Using this service called as "Initiative - report on harmed nature" starts with finding exact location of the observed environmental problem in the field, fixing by one-click the location on the map platform, filling and sending short data form where basic contact information and problem description fields are given.

Further the data sheet information arrives on ArcView 9.3.1 desktop application database at BEF office, where by volunteers it is being checked and channeled to relevant regional and/or environmental state institutions, for further investigation in the field and its solving (removing). As different types of spotted environmental problems (e.g. poaching, illegal waste dumping, water pollution etc.) are managed on different institutional levels and by different authorities, moderation role of BEF is very important to channel problem flow where appropriate and most effective. In addition, BEF reminds institutions if responses are being late, informs every citizen personally about the status of the problem solution process and facilitate communication (respecting anonymous data) between reporter of the problem and relevant institutions. After the problem solution process is completed, reported is informed personally about final results.

During the workflow, status of the problem is continuously updated. Furthermore, all registered problems and its solution status with the whole workflow overview is available for public as free-access service on the platform www.maps.lt and is synchronized on BEF website as well. Such service delivers for public real-time overview on all reported problems and its solution process, as well as it also allows to follow solution workflow of specific problems of concern. Such tool also provides opportunity for the environmental institutions and their executives to easily and visually follow the status of reported environmental problems, follow its solution and compare situation among the regions.

Technological solution of the initiative - now and future

Initiative "Report on harmed nature" technological baseline consists of ArcGIS server publishing data services (JSC Hnit-Baltic), desktop application ArcView 9.3.1 which is used for gathered data treatment and its administration (at BEF office).

One of the most popular website in Lithuania www.maps.lt is being used as a tool to gather information about observed environmental problems, which is made on ERSI technology basis. ESRI JavaScript API (mashup) technologies are used for the dissemination of results and publicity of the initiative through different integrative maps applications.

Currently ArcView software is used for administration of gathered information, generating statistic reports, analyzing data and based on its results, highlights of the systemic problems and potential solutions are offered, which BEF as non-governmental organization communicates to the environmental policy makers in Lithuania. The tool allows everyone to observe generated statistics or search particular problems to observe its solution process.

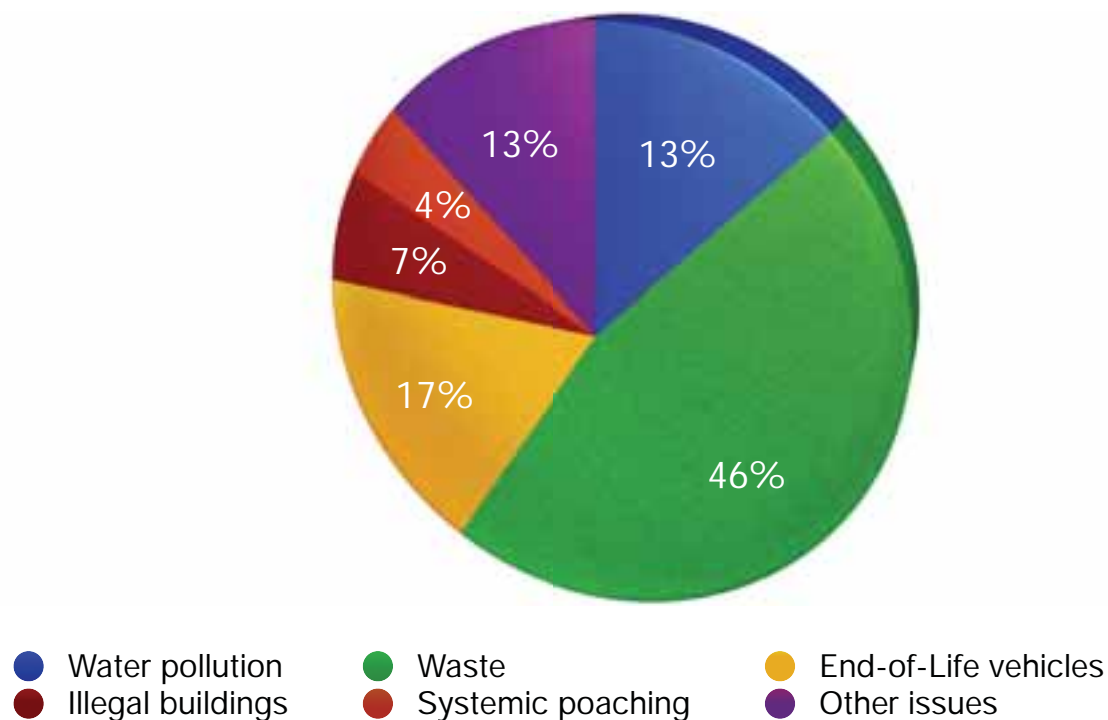
With appearance of the new version of ArcGIS, further development of the system is foreseen. To realize new opportunities the ArcGIS 10 version will be used. Further development will be addressed to automating administration and management processes. For public use interface of the system, it is planned to add such opportunities as time scale evaluation of the data, attach visual information (pictures, videos), marking problems will not be limited to adding point, but also surface polygons or lines (WEB editing). In order to make public involvement even more active, it is planned to provide opportunity to rate problems, add comments and gather to the social groups, which would take initiatives to solve particular problems by own efforts, without interference of enforcement institutions.

New version of ArcGIS 10 makes ideas for the future very easy accessible since most the the above-mentioned issues can be managed with the new software on its standard version (out of the box).

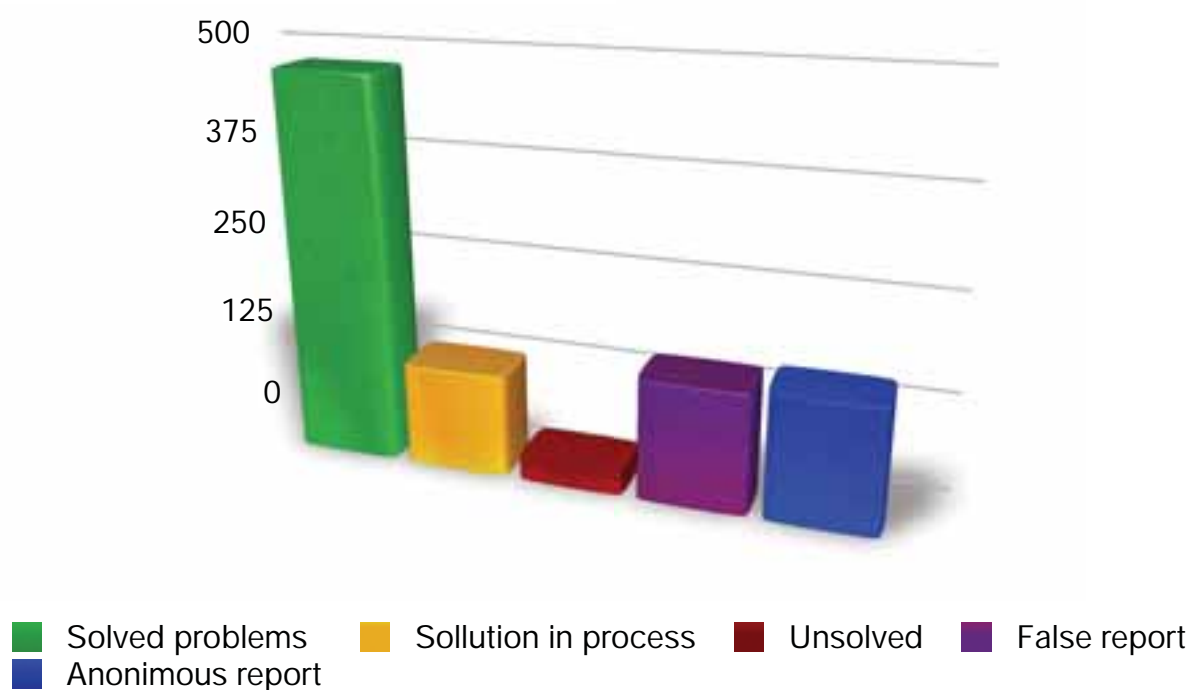
Experience: results so far, challenges and successes

In a 1.5 year of the implementation of the initiative more than 1000 reports were received from the public. The biggest share of the reports are focused on illegal dumping of waste (including end-of-life vehicles) covering 63% of all registered issues. Waste problems are very visual in the field as well as public is very sensitive to it. Rather big share (17%) of waste are end-of-life vehicles, which are found in the yards of the towns or left in remote outside places, such as forest. This type of problem reflects the challenge that after Soviet Union regime opened borders to Europe has caused intensive flow of old, but still running cars to Lithuania car market. After few years, such cars become (hazardous) waste and public did not treated it properly.

Structure of the reported environmental problems on the system "Report on harmed nature"



Structure of the problem solution status





Most of the registered problems, in the given time period for the workflow (1 month) are solved. However still rather big share of the registered issues are names as “anonymous”, which means that the reported did not leave any contact information. Therefore in most cases such problems are not given for further treatment, but they all are still screened at BEF and in case of very serious violation or in case reported problem is well described - it is forwarded to the solution process workflow. Problems classified as “false” means that they are checked in the field and were not observed by the specialists. Surprisingly, the overall amount of fake reports is very low, which may invite to consider that community participating in the initiative is taking it rather conscious.

<- Reported illegal waste dumping in the protected area

Despite noticeable success of the initiative, certain challenges appear and are managed now or will be in near future. they could be break down in following bullets:

- Big amount of the reports generate a lot of paperwork, which causes additional effort to volunteers at BEF as well as to the institutions, which are approached;
- Managed problem as “solved” in certain cases means that the violator has been found and is obliged to remove it, but it does not always mean that it is actually removed, therefore additional efforts are needed to check its final removal;
- Certain records (e.g. as poaching) require very urgent reaction in the field, in such cases this system appear not to be very effective.

Perspective for future

Coming new version of ArcGIS 10 and stronger cooperation mood with institutions and business will bring the initiative to new level expanding its opportunities at the internal uses as well as for outside public. It is foreseen to allow citizen to attach pictures to the reports, comment them allowing not only to monitor the solution process in the field, but also easily report observations on the system. This inspires to initiate networking of local communities, who can jointly report observed environmental problems and monitor its solution process. This would not only allow the initiative to be more intensive, but also strengthens cooperation and trust among society to enforcement institutions. In order to make workflow more efficient, it is foreseen to introduce possibility to synchronized reported data to the GPS devices or computers directly to the responsible institutions. This would allow to make process faster and less efforts demanding to find exact location or generating paperwork.

The future perspective also provides new opportunities for the executives - with a special online reporting application they can observe reported problems in the region, follow speed of the workflow and plan recourses for environmental management. Reports on the national scale allows to observe more "busy" regions and thus suggest modifications of the resources and improvement of public administration sector system.

The last, but not the least - it is foreseen to enlarge geographic scale of the initiative by transposing whole system to other countries. Thus, if you feel motivated to introduce such system in your country - contact us.

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