20.02.2017 r.

Summary of doctoral thesis
M.Sc. Anny Wróblewskiej

pt. „Cost and benefit valuation methods in renaturation process of polder areas on the basis of chosen polders of Żuławy Vistula delta"

This doctoral dissertation takes the issue of renaturation defined as a method of flood protection in the context of polder spatial development to the level justified economically, socially and environmentally. As part of the changes in the function of the polder areas and the possibility of the exclusion of certain areas of activity and their restoration which would enable the improvement of the ecological balance and lead to a pointed increase in the biodiversity. Such a solution would result in a reduction or even complete elimination of costs associated with the maintenance of hydrotechnical infrastructure of polder water management. An important contribution of the thesis is to expand existing models used to assess projects in the field of flood protection, human safety as a public good and its valuation using the Contingent Valuation Method (CVM) which belongs to non-market goods valuation methods.

The aim of the thesis is to develop a theoretical basis and the costs and benefits valuation methodology of the renaturation of a chosen polder area. The subject of the thesis are valuation methods of environmental benefits valuation in relation to the analysis of benefits and problems of polder areas. Two hypotheses were defined. The first is based on the assumption that the method based on the hypothetical market and responses from residents polder areas methods is the most suitable for the thesis aim implementation from environmental valuation methods The second hypothesis assumes that the profitability of renaturation primarily depends on the infrastructure of the polder areas and the usage the the land after renaturation. As the impact of the renaturation is difficult to estimate, selected variants of renaturized polder space usage were developed and analyzed in order to verify the established hypotheses.

The contingent valuation method is the main instrument used in the study out of available environmental goods and services valuation methods. This method, with the help of surveys done in addition to the concept of Willingness to Pay (WTP), allows for the estimation of the environmental resources and value of services which are not usually the subject to market valuations. Research has been based on the so-called consumer theory and is concerned with: preferences and willingness to pay for protection from flooding and environmental assets and services resulting from chosen polders renaturation.

Research carried out in the thesis was done in several stages. Field research of selected areas of Żuławy Vistula delta was the first stage of the study. Field research included a general land inventory including the condition of the infrastructure and productive and non-productive land management. The survey preceded the pilot studies which were the main stage of the research. The aim of the survey carried out with the help of tools used in non-market valuation methods was to provide information allowing to estimate the values of selected public assets. The survey was done with contribution from 500 residents of the Żuławy Vistula delta area. In the next stage of the work the following categories of costs and

benefits renaturation were identified: water and land reclamation infrastructure, agricultural production, the value of assets, nitrogen emission, reed production, hunting, fishing, a sense of safety from the risk of flooding, the value of nature reserve and biodiversity. In the next stage in order to develop a comprehensive methodology for assessing the cost and benefits of the project renaturation area five hypothetical variants of the scenario were adopted: the first variant - "zero" variant, the second variant - "meadow", the third - "wetlands", the fourth variant - "tourist-recreational" ant the fifth variant - "mixed".

In order to verify the hypotheses, according to the costs and benefits analysis methodology, the categories of costs and benefits properly occuring are assumed for all given variants and subsequently the net present value (NPV) rate of the project has been calculated for all variants, which allows to determine the economic efficiency of the planned project.

In the final part of the thesis, results obtained were compared and conclusions concerning the selection of the most appropriate variant from the economic, social and environmental point of view have been drawn.