

Strategy-proof location of public bads

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Knowledge valorisation refers to the process of creating value from knowledge, by making knowledge suitable and/or available for social (and/or economic) use and by making knowledge suitable for translation into competitive products, services, processes and new commercial activities.

This thesis investigates the problem of locating two noxious facilities as a joint decision of a group of agents. In this thesis, the class of rules that satisfy certain properties has been characterised. One such property is strategy-proofness, which says that truth telling is a weakly dominant strategy. The objective of such studies is not to determine whether the imposed properties are “relevant in the real world, or not”. Our objective is to find out the set of solutions of the given problem satisfying the properties. If a governing body finds these properties as “useful”, then that entity can use our result.

For example, in recent news, nine countries in the North Sea region and the European Commission have decided to enhance their collaboration in order to better utilise the potential of the North Sea as an area for wind farms. Wind farms are generally regarded as public bads. These farms are elegant sources of green energy, essential to combat the increasing danger of global warming; but they provide negative externalities. A crucial problem in this scenario is to decide where to place these wind farms. In the first two chapters, we provide solutions to this problem while imposing four properties. The first one is strategy-proofness. The second one is country-wise Pareto optimality. This is the usual efficiency property that ensures sovereignty of each country to a large extent. The third property is non-corruptibility, which ensures that no one can gain by bribing some individuals. The last property we introduced is a tie breaking condition. Now if the European Commission assumes that these properties are essential in deciding the collaboration structure, then our work might be useful for them.

In the third chapter we provide strategy-proof and Pareto optimal solutions about how to locate two public bads in a region. Any municipality, which has to decide about locating two garbage dumping sites along a road might find our work useful.

The last chapter of this dissertation is motivated by an example from the state of West Bengal in India. An Indian car manufacturer approached the state government with a proposal for building a car factory. The government’s decision on the location of the said factory was turned into a controversy and could be considered as a factor in the regime change that followed in the next state election. We model this scenario as locating a public facility, which is good for some agents and bad for others. Although some work still needs to be done in this chapter, we provide some partial solutions

that satisfy strategy-proofness and Pareto optimality. These might be useful to the government, if they are looking for mechanisms that satisfy these two properties.