Bandwidth management and optimisation

Policy development workshop

Unit 0 – Understanding public goods and ice-breaker

Group exercise – Facilitators notes

This document describes a group exercise that can be carried out at the beginning of the workshop as an ice-breaker. The exercise aims at showing the nature of public goods.

Document Notes

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Summary

On completion of this session the learner will have:

1. Interacted among themselves
2. Reflected on the nature of problems of collective choice and what the implications for bandwidth management are

Introduction

“Public goods” is a term used by economists, especially public policy economists. The term itself has a complex definition, but for our purposes we will define a public good as**:**

any good that the members of a community benefit from, irrespective of whether they have contributed to it, and which they can consume in arbitrary amounts – that is, as much or as little as they wish to.

Public goods are invariably subject to abuse by “free riders” who over consume them at the expense of the community. Analysis shows that a rational self-interested individual will choose to be a free rider in the absence of mechanisms to regulate access to a public good: hence the importance of developing such mechanisms, whether they be technical or policy-based. Without such mechanisms, it is extremely difficult for a community to regulate access by itself. This initial exercise shows how communities struggle with this problem, and how they usually arrive at outcomes that are not in the general interest.

The exercise is a game originally developed by Michael Taylor. The only materials needed to play it are some toy money of the kind used in the game Monopoly. The amount needed is 200 dollars per person. 100 dollars is given to each player and the bank retains the rest – it will be used during play. The game’s rules are:

1. The game is played in a series of rounds. Each round has two phases.
2. In phase 1 of a round, each player must pay ten dollars into a pool. This amount is the “survival cost” for the round, and any player who cannot pay it is deemed to have died and takes no further part in the game.
3. The bank contributes an equal amount to the pool – thus, if twenty players each pay a survival cost of ten dollars, the initial pool is 200 dollars; the bank adds another 200 dollars, so the pool becomes 400 dollars.
4. In phase 2 of a round, the entire pool is auctioned to the highest bidder. A special feature of the auction however, is that the winner wins not only the pool, but also the bids of every other player. A player who makes a bid has effectively lost it and can only recover it by winning the auction.
5. Only individuals may bid. They may however borrow money from others.
6. To better another player’s bid, a player must bid more: an equal bid is not good enough.
7. Any agreement among players is permitted, but no agreements are binding.

If the game’s instructions are not clear then a few practice rounds can be played.

The game can be ended once the likely outcome is clear to everyone. A plenary discussion will follow as described below.

Plenary discussion

Once the game is complete, participants should discuss the following:

1. What outcome is in the best interests of all the members of the group?
2. How could the group have achieved this outcome, if it didn’t do so?

Notes on the game

Whenever this game is played with a sufficiently large group - say ten or more - it almost always follows the same pattern. Once the bidding for the first round opens, nobody is keen to bid - they are unsure of the implications and the risk. But inevitably, some brave soul bids a dollar. Others see the prospect of the first bidder walking away with the entire pool - which is a substantial amount of money - and they proceed to make competitive bids, initially small, but progressively larger. Since all bids are lost, bidders rapidly acquire a vested interest in winning! Sooner or later one of the bidders will have bid all of his or her money - ninety dollars, since the initial allocation was 100, and ten went into the pool. At this point they can't be outbid by any player in isolation - nobody has more than ninety dollars. At this point consortia begin to emerge - one player will borrow from another, and competing bidders will do the same thing. In a typical game, two strong consortia might emerge; or only a single consortium, with all the other players acting in isolation, or perhaps in weak consortia. Such consortia invariably form around geographical locality: that is, players sitting next to one another consort, overriding other interests (such as people from the same institution forming a consortium). This is because negotiation is simply much easier with the person in the next seat!

Since no agreements are binding, a consortium faces the risk that the individual who bids on its behalf (remember that only individuals may bid) will not share the proceeds with the rest. If this happens then the consortium dissolves and its former members will try to punish the defector by entering into new consortia. (Remember that a player who is not winning money is steadily running down his initial allocation, and will eventually die).

Sometimes a single consortium will emerge and the rest of the group will see the threat that they face - i.e. being bid out of existence - and they will combine to resist. But they also face the same problem as any consortium, i.e. will the individual who bids share the proceeds?

The rational solution for the group as a whole is not to compete among itself. Since the bank is contributing at every turn, each individual could be getting progressively wealthier (by ten dollars a round) if a collective agreement could be reached. A rational agreement would be to nominate one bidder, who bids one dollar, wins the pool, and redistributes it. (But of course, the same risk of free riding applies in this case.)

The game's outcome cannot be predicted in advance - it can be wildly unstable - but one of the outcomes above is quite typical. It is tremendous fun to play.

Conclusion

The purpose of this game has been (a) to get the group to interact among itself and feel comfortable with itself, and (b) to demonstrate how problems of collective choice are difficult to solve. Since bandwidth is a public good – it is subject to abuse by free riders, who are acting in their own rational best interest – we need mechanisms to manage it for the good of all.