

Network of NGOs in India

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NGO NETWORK

In this project we are studying the Network of NGOs in India and try to answer some of the interesting questions.

Through our study we are trying to answer two main questions important for this network.

1. Are the number of NGO's working in different parts of the country sufficient/greater/less than what is required.

2. Are the themes on which NGOs work skewed towards only a very few themes, while others are being neglected.

We start by trying to answer the second question first and for this we fix the definition of our network.

Our network will be a bipartite graph of the NGOs and the activities/themes. We have a dataset of about 650 NGOs and together they are working on about 45 themes. From this graph we study the degree distribution of the NGOs and the activities and also the rank vs degree for both the activities and the NGOs.

Each of the NGO is working on certain issues and in the bipartite network there is an edge between the NGO and an issue if the NGO works on this issue. As a result there are many issues which are common to many of the NGOs. We started with this network because by analyzing this network we can easily find the rank of the NGOs as well as the issues which will tell us that which is the most common issue, what is the maximum number of issues on which a NGO is working etc.

We have plotted the graphs and tried to see if they follow a certain pattern so that we can infer certain results from the network.

Later in the project we have built another network among the NGOs and they have an edge between them if they deal with the same issues and these edges have been assigned weights depending on the number of common issues between the nodes. We have identified clusters in the network and for this we have implemented a clustering algorithm.

From the clusters that we have obtained we have tried to analyze the communities and we find that the communities form a pool of issues. So in a way if a new community

is emerging and if it chooses one of the issues from the list of activities then it is more likely that later on it will start working on other activities in the same community. Hence a cluster of activities have been formed from the data which tells us the activities on which the NGO is working.

We have found out the centrality of the NGO nodes using Pajek. The NGO network is a weighted network.

0.1 Figure 1

This plot tells us the degree distribution of the activity nodes which indicates that there are very few activities which have high degree. This shows that there are some activities for which almost all the NGOs are working and there are some which are neglected and are not taken care of.

0.2 Figure 2

The k vs p_k curve clearly indicates that many activities are neglected and are not taken care of by most of the NGOs.

0.3 Figure 3

This curve indicates that there is a sharp decrease in the number of NGOs working on many activities. So there are only a few organizations which deal with all the problems prevailing in the society.

0.4 Figure 4

The log log plot gives a more clear understanding of the fact that very few NGOs work on all activities.

0.5 Figure 5

The plot shows that there are some activities which have a degree as high as 300 and a low as 1.

0.6 Figure 6

The rank vs degree curve for activity nodes shows that there is a hierarchy of preferred activities throughout that is 1/2 activities are taken care of by all the NGOs, next 5/6 activities are taken care of by lesser number of NGOs and so on. This hierarchy might be a reflection of either "importance" of an activity or that some of the activities are neglected.

0.7 Figure 7

This curve seems to follow a two regime power law, which means that there are some NGOs which cater to many activities while others (most of them) concentrate on a few activities.

0.8 Figure 8

This plot is a log log plot of rank vs degree for ngo nodes in a bipartite network.

0.9 Figure 9

The average centrality of the network is 0.699815.

0.10 Weighted NGO Network

From the second network which we build, we found out the centrality of the NGO nodes. We observe that with the change in the threshold value the number of clusters decreases that they are merging. There merging gives a certain ordering of the nodes, i.e. the nodes belonging to a cluster are likely to work on same activities. When these clusters are merging they are merging with those clusters where they share a common interest among the activities. Initially most of the clusters contain only one NGO node and from the community merging we find that the activities which only a few NGOs were working on forms a separate community.

0.11 Results

There are certain number of neglected activities and more NGOs should work on these areas otherwise these areas will remain unexplored and these problems will always prevail in the society. We can also say that the activities which almost all the NGOs are working on are the burning problems of our society so most of the NGOs are working on it. If a new NGO emerges and if it takes up a certain activity then we can find that it belongs to which community and predict the issues on which it will work later.

0.12 Works Done

Collected a data set of 650 NGOs. Build a Bipartite network of activities and NGOs & another weighted network of NGOs. Found the degree distribution of the NGO nodes and the activity nodes Centrality finding using Pajek Clustering by implementing the clustering algorithm through C code. Data Source: http://www.janmanch.org/NGO_database

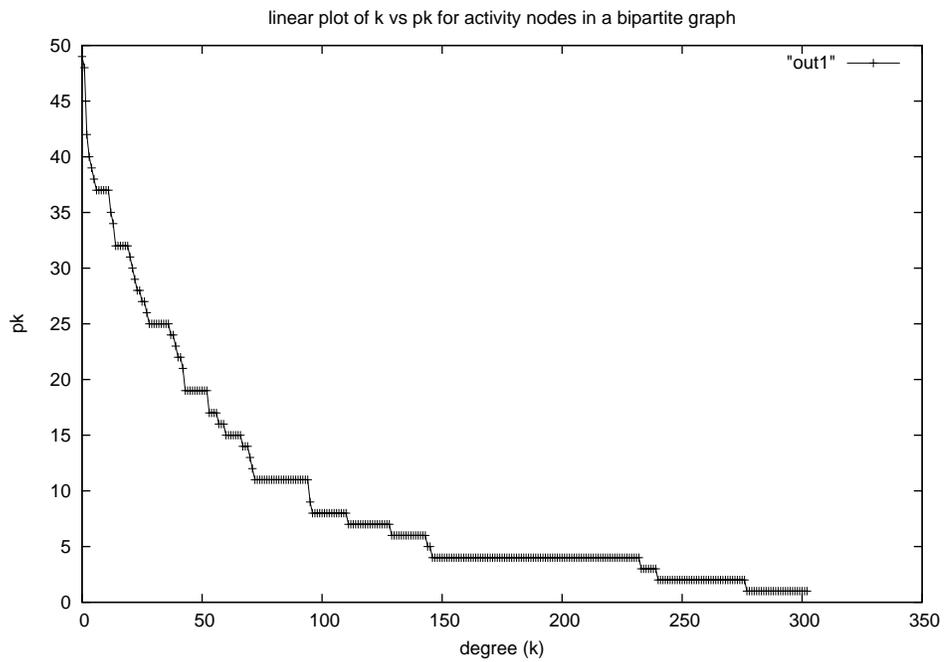


Figure 1: Linear plot of Degree(k) vs pk for activity

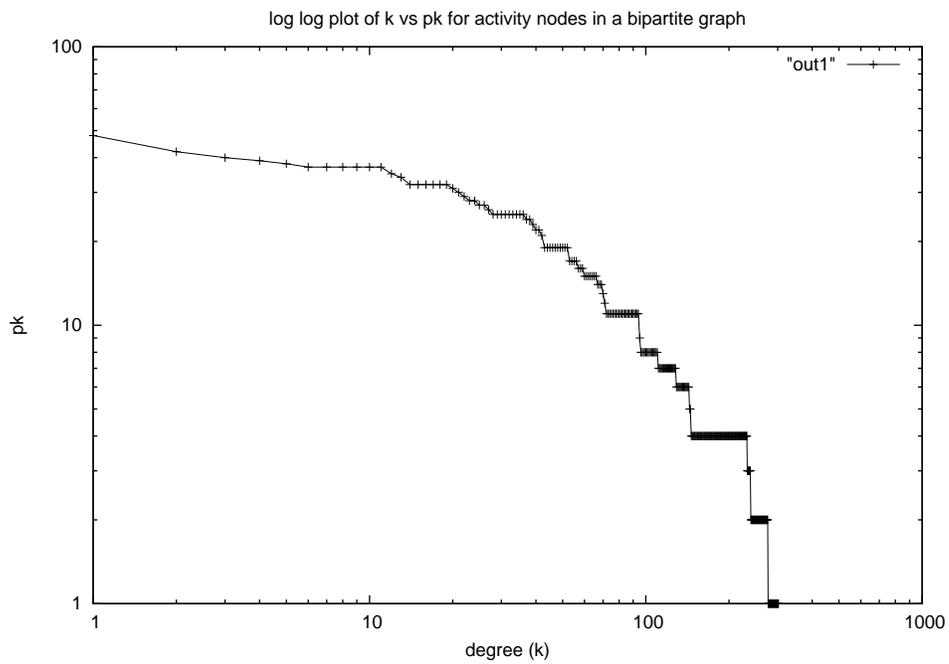


Figure 2: Log log plot of Degree(k) vs pk for activity

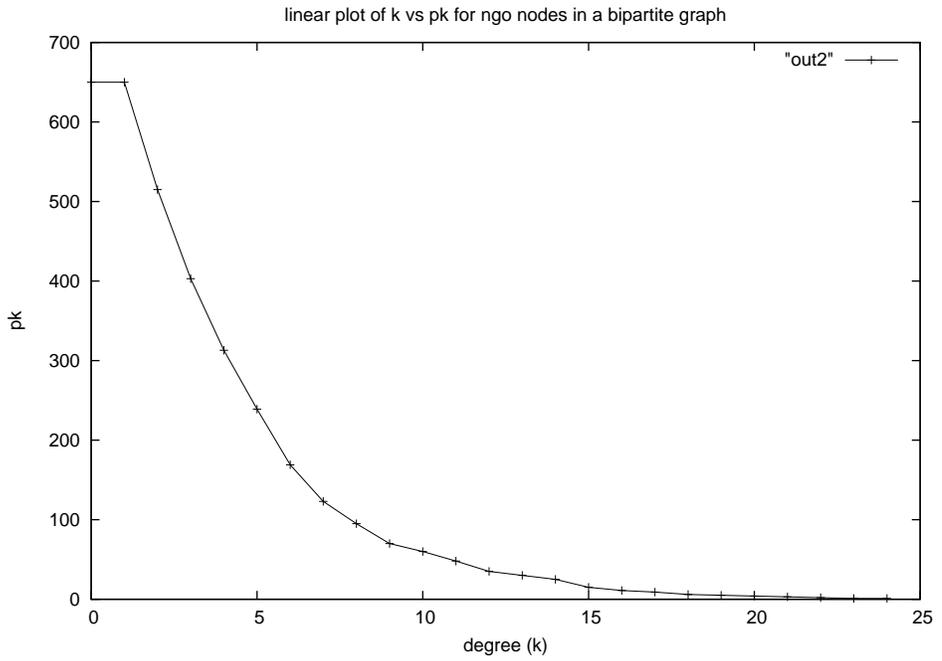


Figure 3: Linear plot of Degree(k) vs pk for ngo

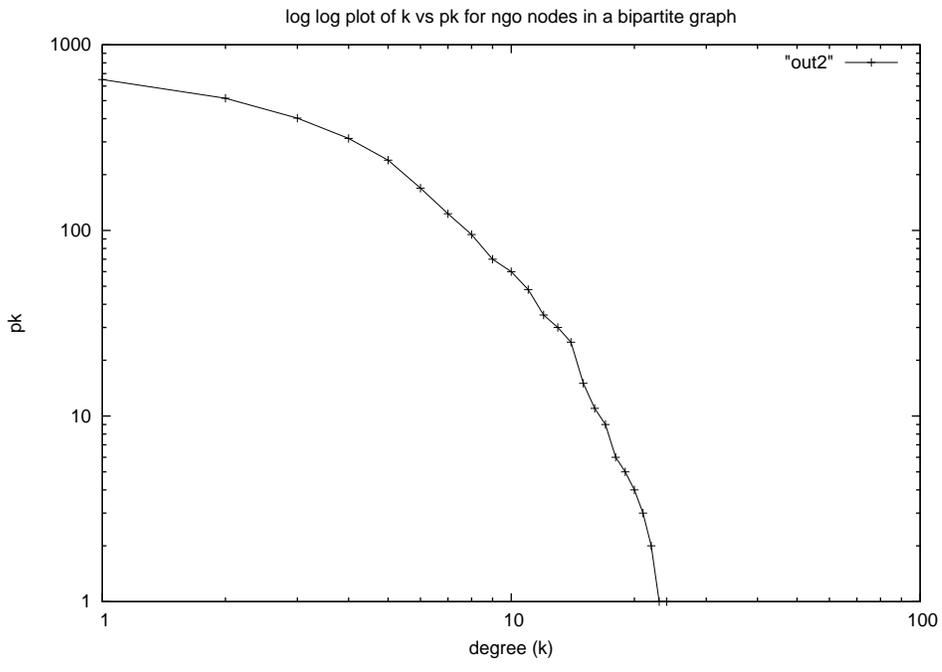


Figure 4: Log log plot of Degree(k) vs pk for ngo

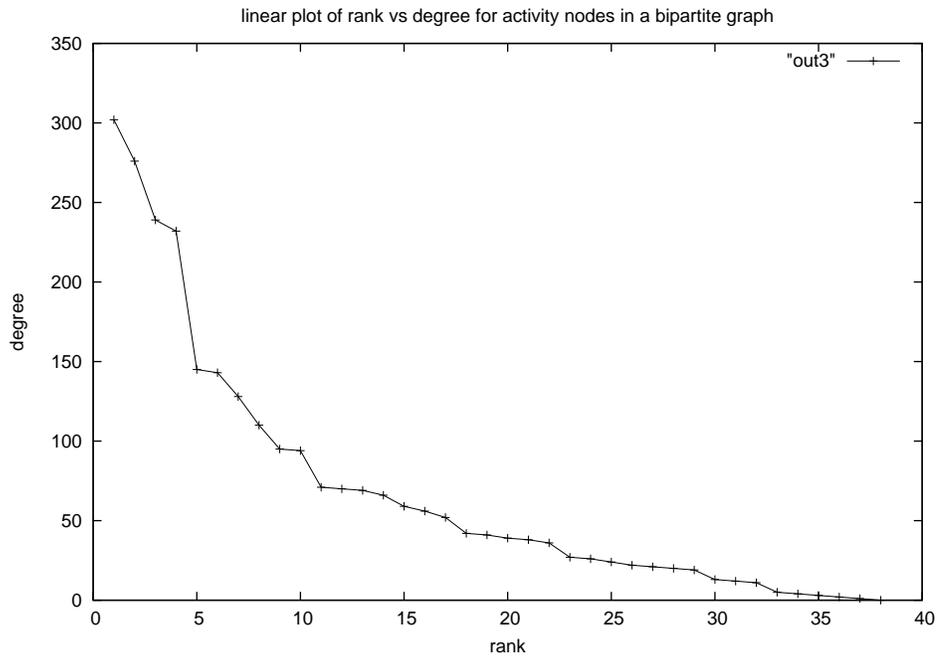


Figure 5: Linear plot of rank vs degree for activity

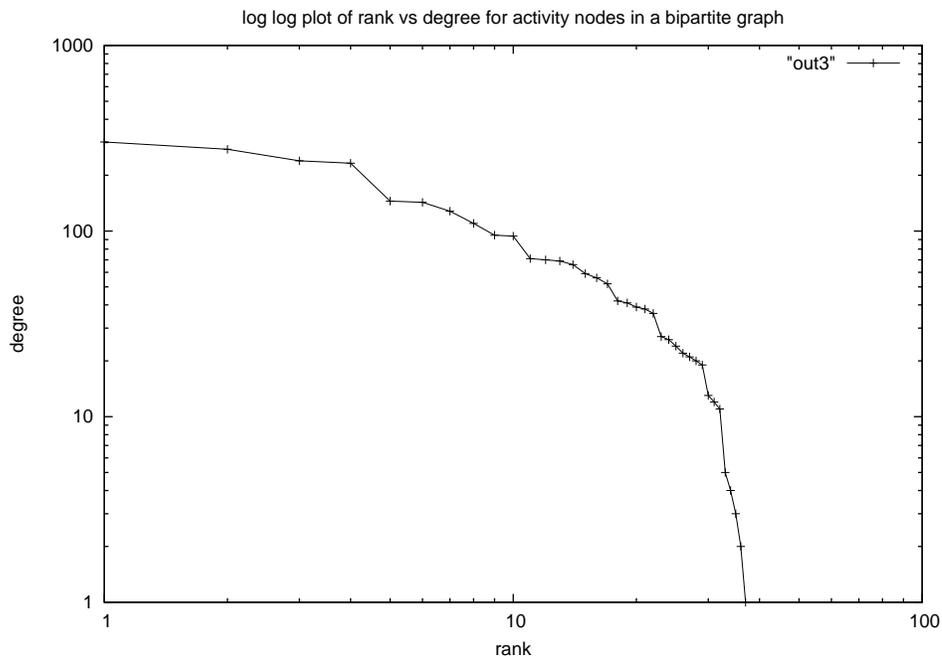


Figure 6: Log log plot of rank vs degree for activity

Table 1: List of Activities

Rank	Activity	Degree
1	Child welfare	302
2	Health	276
3	Women's issues	239
4	Education	232
5	Environment	145
6	Development(General)	143
7	Rural Development	128
8	Agriculture	110
9	Disadvantaged communities	95
10	Disability	94
11	Poverty	94
38	Intellectual Property	5
39	Public Administration	4
40	Industry	3
41	Information and Communications Technology	2
42	Wildlife	2
43	Infrastructure	1

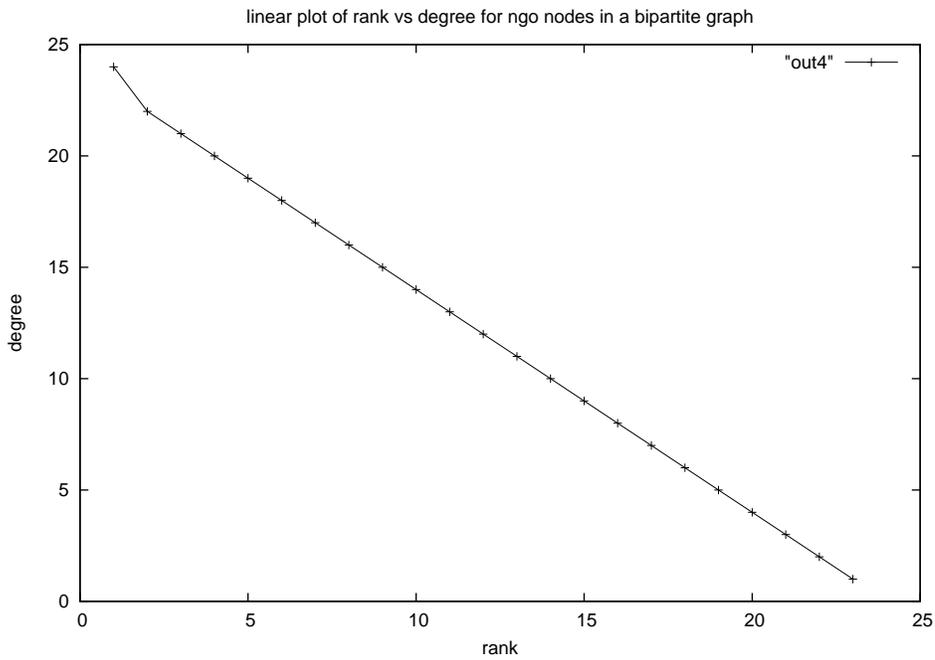


Figure 7: Linear plot of rank vs degree for ngo

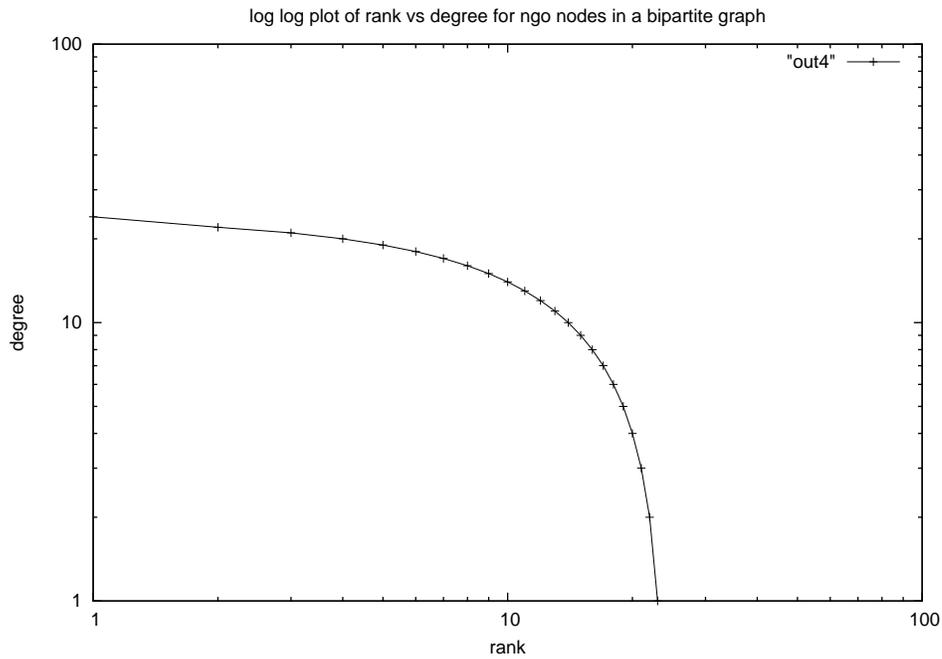


Figure 8: Log log plot of rank vs degree for ngo

Table 2: Centrality Table

Sl No.	Range	No. of nodes.	Avg. centrality	Min centrality	Max centrality
1	0.0-0.5	7	0.415186	0.0000000	0.4992308
2	0.5-0.6	133	0.553530	0.5031128	0.5985227
3	0.6-0.7	184	0.653202	0.6007457	0.6994628
4	0.7-0.8	189	0.749470	0.7002198	0.7997566
5	0.8-0.9	118	0.837187	0.8007464	0.8998652
6	0.9-1.0	19	0.933002	0.9074377	0.9758719

Table 3: Threshold Community Table

Threshold(x)	Number of communities
11	440
10	439
9	437
8	435
7	428
6	413
5	384
4	322
3	233
2	112
1	5
0	2

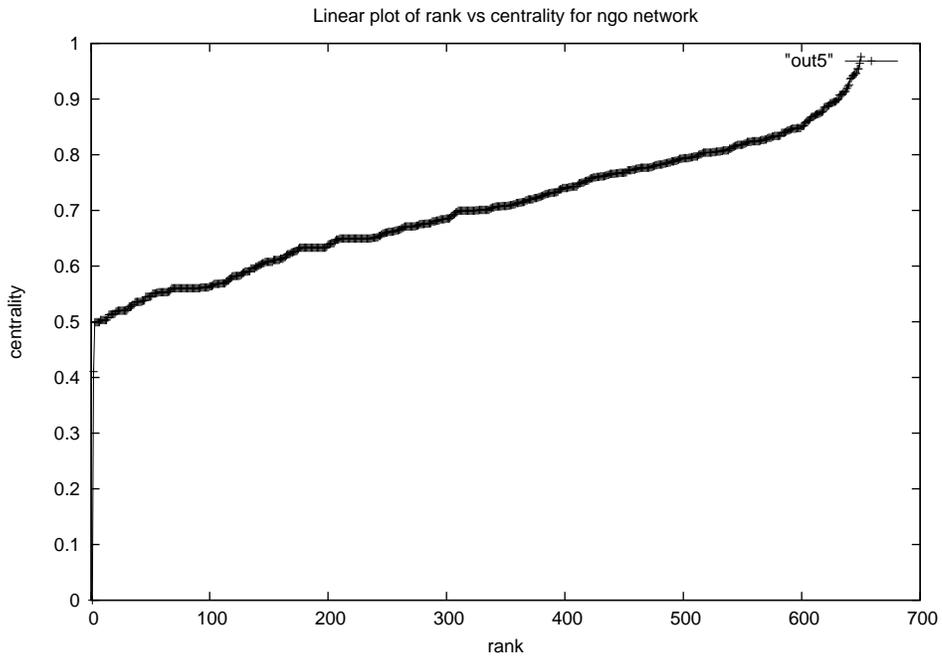


Figure 9: Linear plot of rank vs centrality for ngo nodes in weighted NGO network

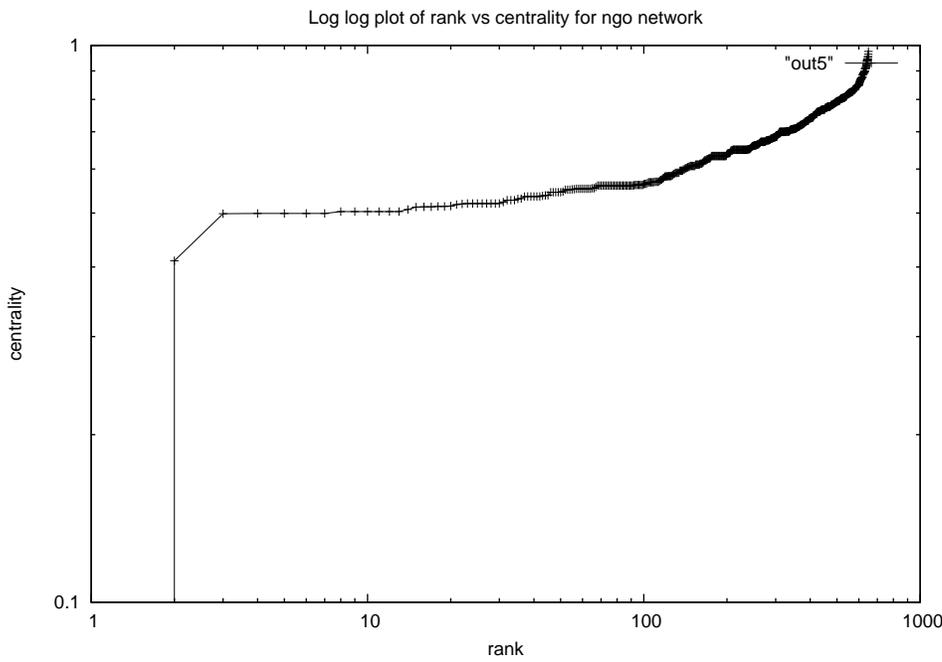


Figure 10: Log log plot of rank vs centrality for ngo network