Visualizing Networks with Overlapping Groups

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Driven to Discover℠

Objective 1

Understand conceptually the reasons why it might be help to visualize networks where nodes have multiple connections AND membership in multiple groups (or none).
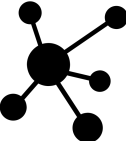
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Objective 2

Apply the R script and resources for visualizing where nodes with multiple connections AND membership in multiple groups (or none).

Basics: Networks + Relational Data

Building Networks

Node	the "things" within a network	Person, organization, or "thing" / Attributes like gender, age, group, etc.
Tie	how those "things" are connected	Connected directly or indirectly / Attributes like direction, strength, etc.
Dyad	focused on pairwise relations, fundamental unit of network data collection	
Network	all of the nodes, their connections, and dyads (or no connections at all)	Network level - cohesiveness / Subnetwork level - cliques, groups, etc. / Node level - position in network

Nodes

Also referred to as actors or vertices or alters

Nodes may have connections and attributes, and may come in different modes

"the units that are connected by the relations whose patterns we study" (Marin & Wellman, 2014)

Examples include:
- Individuals
- Groups/Teams
- Organizations
- Nations
- Artifacts
- News articles
- Websites
- What else can you think of?

Apply this to your work:

*List off as many nodes from your area of work as you can think of.*

Ties

Also referred to relations, connections, edges or arc

Examples of ties include:
- Interpersonal relations: kinship, co-workers, friendship, social media following
- Interorganizational relationships: organizations/groups, trade partners, coalitions, alliances
- Artifacts connections: websites (via hyperlinks), news articles (via authorship), co-occurrences

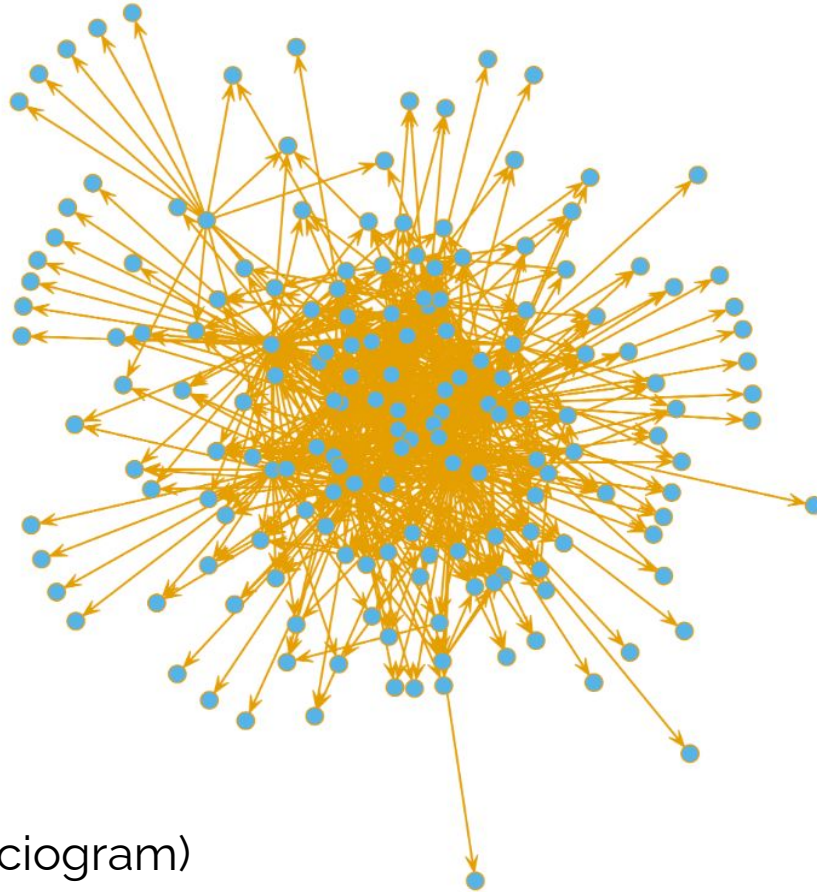Ties can come in the following format:
- Directed v. Undirected
- Binary (1,0) v Valued (continuous)
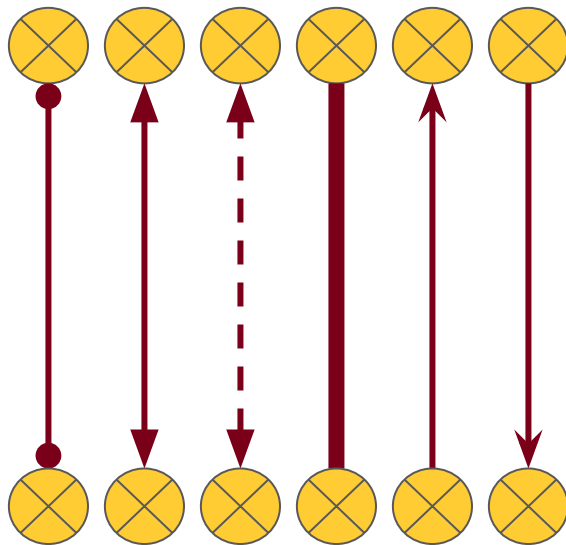
Apply this to your work:
How are those nodes from the previous slide connected?

Visualizing: Basic Network Graph

Basic network plot (sociogram)
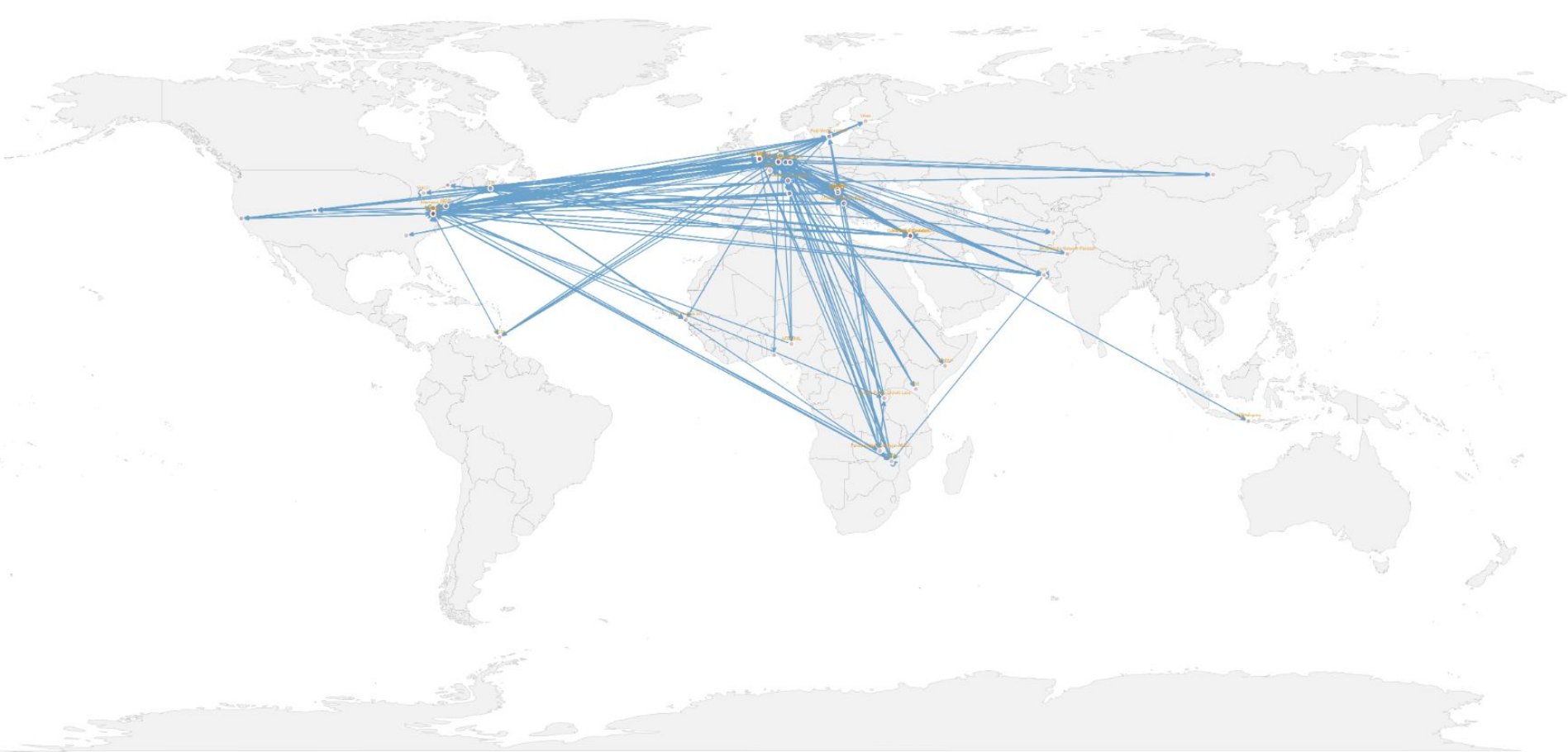
Network plot on geo-political map

Why should you care about visualizing relation data?

My argument:

One of the **most useful aspects** of network analysis and relational data is the **ability to visualize how "things" are connected**. But, focusing on things and their connections is limiting when those things are also connected in other and often hidden ways.

Visualizing: In-group/Out-group Ties
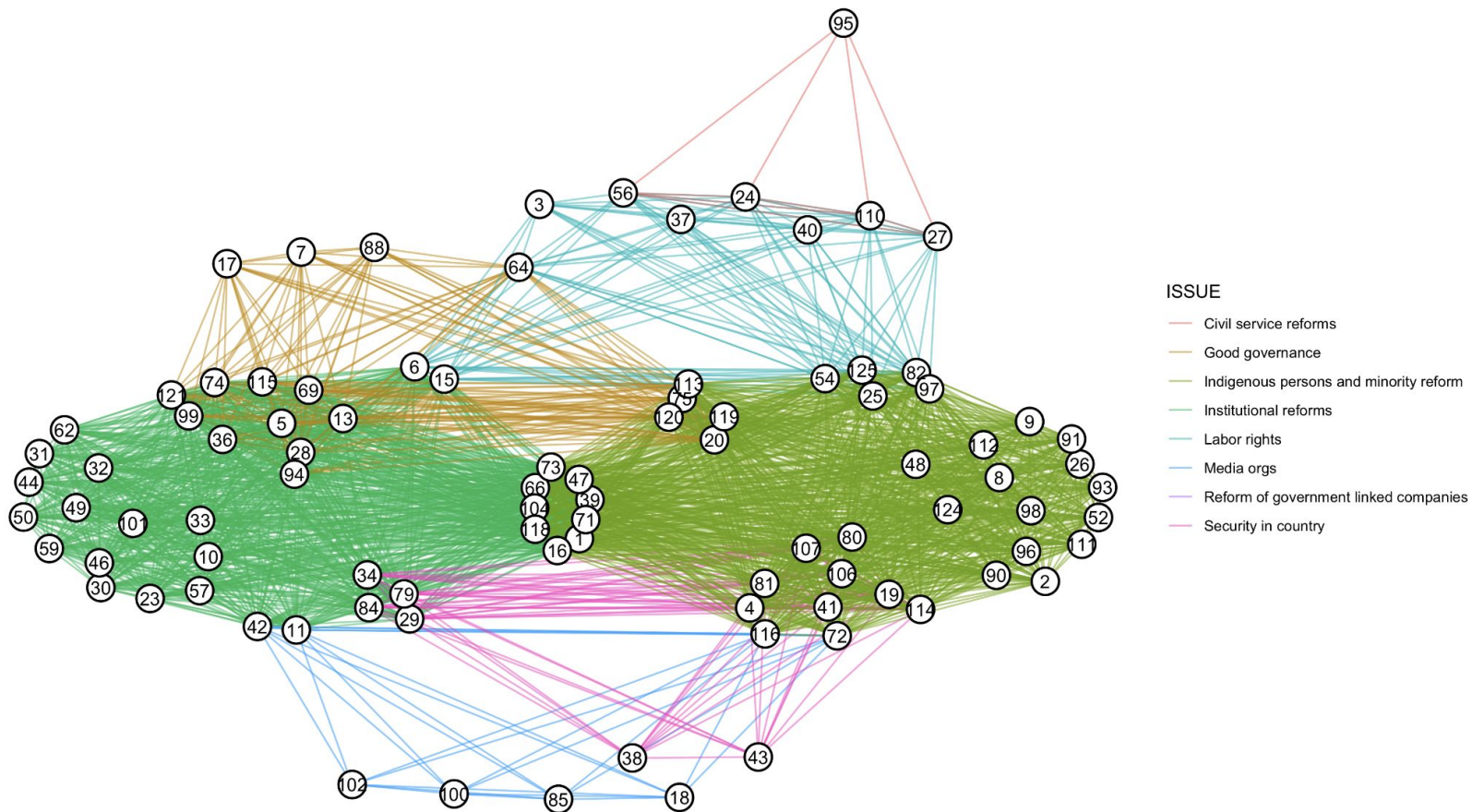
Sociogram of CSOs In/Out-Group Ties

ISSUE

- Civil service reforms
- Good governance
- Indigenous persons and minority reform
- Institutional reforms
- Labor rights
- Media orgs
- Reform of government linked companies
- Security in country

Visualizing: Overlapping Groups

CIVIC ENGAGEMENT
COMMUNITY ENGAGEMENT
CORPORATE ENGAGEMENT

EMPLOYEE ENGAGEMENT
ORGANIZATION ENGAGEMENT
PUBLIC ENGAGEMENT

SOCIAL MEDIA ENGAGEMENT
STAKEHOLDER ENGAGEMENT
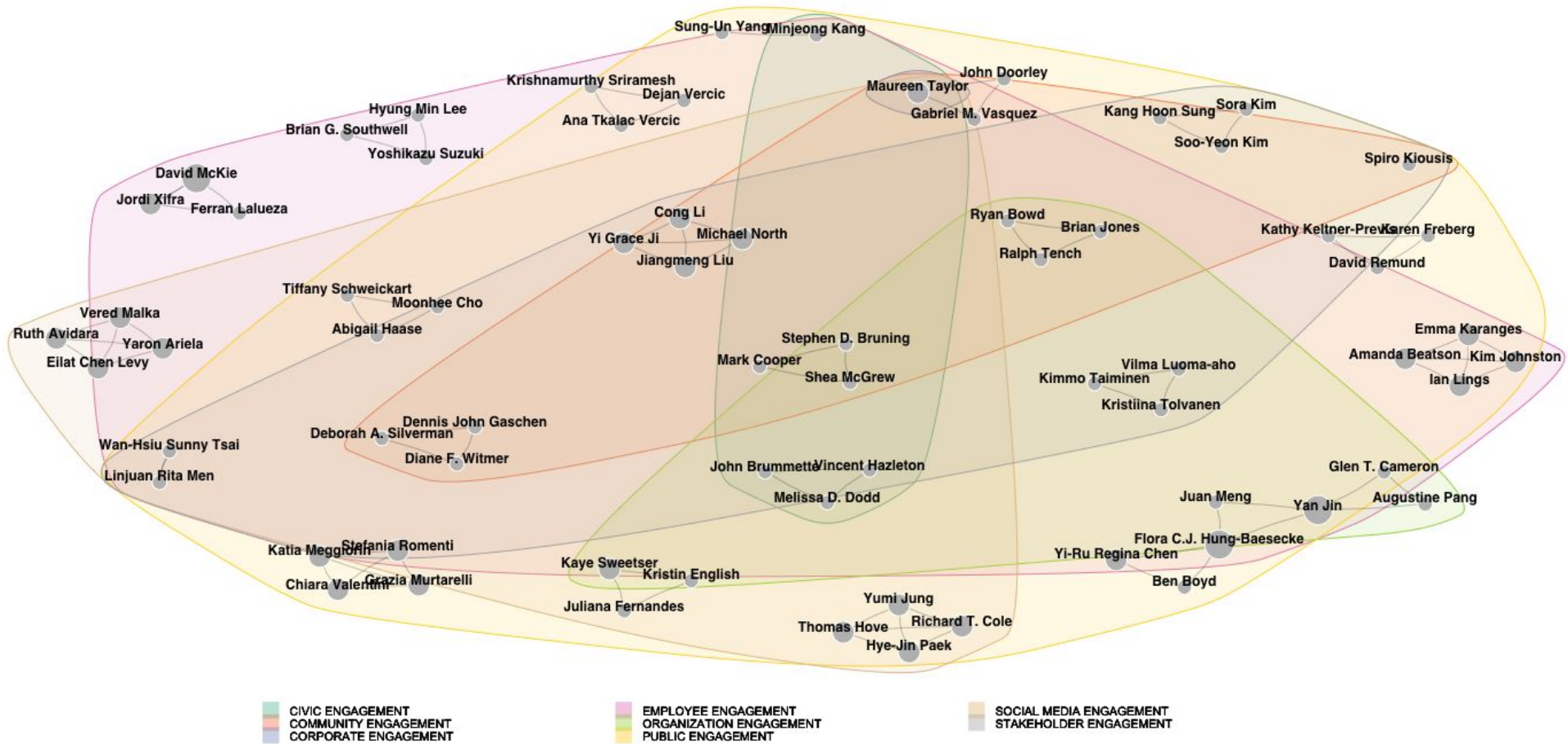
Authors using multiple treatments of "engagement"

My Scholarship Network

Saffer (2015)

Yang & Saffer (under review)

Yang, Saffer & Li (under review)

Saffer (2016)

Saffer (2019)

Saffer, Yang & Taylor 2018

Saffer et al. (2019)

Yang & Saffer (2018)

Saffer, Yang & Qu (in press)

Saffer et al. (under review)

Kreiss & Saffer (2017)

Kent, Sommerfeldt & Saffer (2016)

Saffer, Taylor & Yang 2013

Yang, Taylor & Saffer (2016)

Morehouse & Saffer (under review)

Harker & Saffer (2018)

Morehouse & Saffer (2018)

Morehouse & Saffer (in press)

Saffer, Sommerfeldt & Taylor (2013)

Kent & Saffer (2014)

Schroeder & Saffer (2016)

Lazard, Saffer, et al. (2016)

SESH Study Group & Tucker (2017)

Cao et al. (2017)

Benedict et al. (2018)

Cao, Saffer, et al. (2019)

Cluster 1: Social Media & Health

Cluster 2: Collaborations with Colleagues

Cluster 3: Collaborations with Advisees

Int'l Networks & Social Capital

Social Media & Public Relations

Lazard, Saffer, et al. (in press)

Hall, Saffer & Noar (2019)

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Sociogram of CSOs ties and overlap of issues
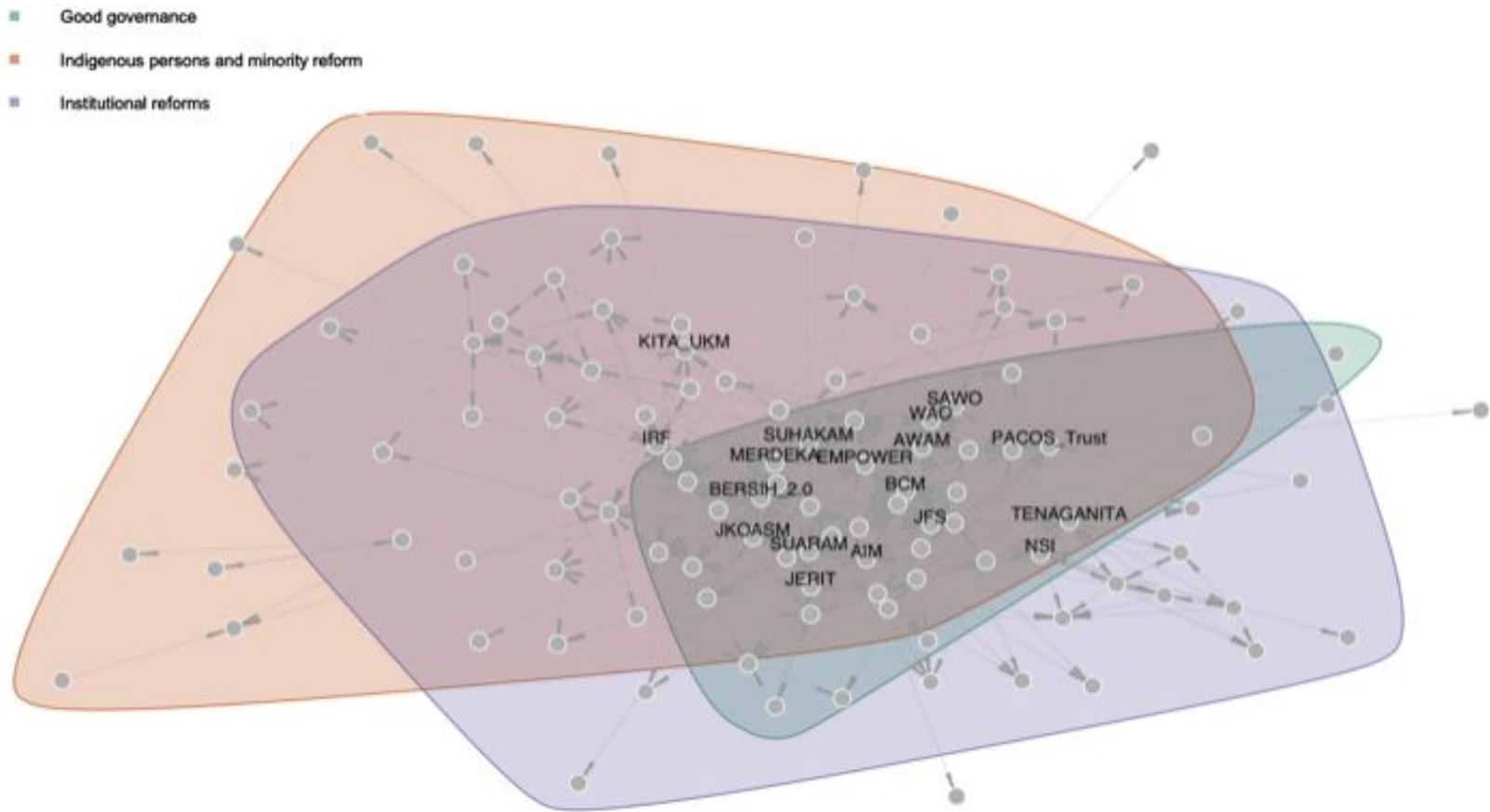
Sociogram of CSOs ties and overlap of network's prominent issues

Thank you!