

# 1 Game Description

## 1.1 Enviornmentment

- Enviornmentment with finitely many states
- Where there exist a group of people locally
- Each state has a unique goal value for each player
- Randomness

## 1.2 Players

- Capacity of players
- Each with finitely many moves

## 1.3 Dynamics

- Finitely many steps
- All Players move on all steps(some no Ops)
- Enviornmentment changes only in response of moves

# 2 Multiple Player Games

- changes depend on action of others and those actions cannot be controlled, So the player must consider all possible action of others.
- Games can be a Fixed Sum game Vs. Variable Sum Games
  - For the Fixed Sum Game:
    - \* Total reward in all states is the same
    - \* For one player to get more, the others must get less
    - \* Many common game is zero sum for example Chess - winner or loser
  - For the Variable Sum Game:
    - \* Possible for one player to get more without other player get less