AGSTATS

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Budget (as discussed)

Total $ committed

```
sum(data$budget)
```

```
## [1] 210364626
```

Breakdown by global, regional, national-level projects

```
tab <- data %>%
            group_by(supportType) %>%
            summarize(totalBudget = sum(budget))
knitr::kable(tab)
```

supportType	totalBudget
Global	31092324
National	159677132
Regional	19595170

Total FAO as donor & implementer

```
fao <- filter(data, donor == "FAO" & implementer == "FAO")
sum(fao$budget)
```

```
## [1] 9694454
```

Projects

Total # active projects

```
nrow(data)
```

```
## [1] 127
```

Breakdown by global, regional, national-level projects

```
tab <- data %>%
            group_by(supportType) %>%
            summarize(numberProjects = n())
knitr::kable(tab)
```

supportType	numberProjects
Global	5
National	106
Regional	16

Total FAO as donor & implementer

```
tab <- fao %>%
            group_by(supportType) %>%
            summarize(numberProjects = n())
knitr::kable(tab)
```

supportType	numberProjects
National	41
Regional	1

Global level

Top (say 5?) donors by budget, or more if the last few are close

```
donor <- data %>%
              group_by(donor) %>%
              summarize(total = sum(budget))

tab <- arrange(donor, desc(total))
knitr::kable(tab)
```

donor	total
EU	84048962
UK	17741006
BMGF	15544021
IADB	15000000
BMGF, UK, Italy	12076112
USAID	9832264
FAO	9694454
Congo	7652668

donor	total
BMGF, UK	7587769
Japan	5635270
JICA	5000000
Australia, Sweden, USA	3750000
ADB	2500000
Italy	2229877
WFP	1830540
Belgium	1800000
U.S. State Department	1750000
AfDB, FAO	1670938
Multilateral	1259984
Sweden	1228275
Romania	686810
WB	500000
Netherlands	445994
Turkey	330000
UNECA	260000
World Bank	200000
Multilateral, UK	90682
UNDP	19000

Top donors by # projects

```
donor <- data %>%
              group_by(donor) %>%
              summarize(total = n())

tab <- arrange(donor, desc(total))
knitr::kable(tab)
```

donor	total
FAO	42
UK	22
EU	18
BMGF	6
Japan	6
USAID	6
Italy	4
ADB	2
BMGF, UK	2
AfDB, FAO	1
Australia, Sweden, USA	1
Belgium	1
BMGF, UK, Italy	1
Congo	1
IADB	1
JICA	1
Multilateral	1
Multilateral, UK	1

donor	total
Netherlands	1
Romania	1
Sweden	1
Turkey	1
U.S. State Department	1
UNDP	1
UNECA	1
WB	1
WFP	1
World Bank	1

Regional level

Top (say 5?) donors by budget, or more if the last few are close

```
donor <- data %>%
              group_by(Region, donor) %>%
              summarize(total = sum(budget))

tab <- arrange(donor, Region, desc(total))
knitr::kable(tab)
```

Region	donor	total
Africa	EU	53437192
Africa	BMGF	8175199
Africa	Congo	7652668
Africa	BMGF, UK	7587769
Africa	FAO	5825812
Africa	JICA	5000000
Africa	USAID	4702000
Africa	Japan	3227556
Africa	Italy	2001877
Africa	WFP	1830540
Africa	AfDB, FAO	1670938
Africa	Netherlands	445994
Africa	UNECA	260000
Asia & Pacific	EU	14376231
Asia & Pacific	UK	6162307
Asia & Pacific	Australia, Sweden, USA	3750000
Asia & Pacific	ADB	2500000
Asia & Pacific	FAO	2455100
Asia & Pacific	Japan	1995142
Asia & Pacific	BMGF	1731309
Asia & Pacific	USAID	1500000
Asia & Pacific	Multilateral	1259984
Asia & Pacific	Sweden	1228275
CIS	USAID	2811000
CIS	EU	2780868

Region	donor	total
CIS	U.S. State Department	1750000
CIS	Romania	686810
CIS	WB	500000
CIS	World Bank	200000
CIS	Italy	88000
CIS	FAO	62000
CIS	UNDP	19000
Global	BMGF, UK, Italy	12076112
Global	UK	11578699
Global	BMGF	5637513
Global	Belgium	1800000
Global	Japan	412572
Global	FAO	349000
Global	Turkey	330000
LAC	IADB	15000000
LAC	FAO	1002542
LAC	USAID	819264
LAC	EU	635324
LAC	Italy	140000
Near East	EU	12819347
Near East	Multilateral, UK	90682

Top (say 5?) donors by budget, or more if the last few are close

```
donor <- data %>%
              group_by(Region, donor) %>%
              summarize(total = n())

tab <- arrange(donor, Region, desc(total))
knitr::kable(tab)
```

Region	donor	total
Africa	FAO	20
Africa	EU	9
Africa	BMGF	3
Africa	Japan	3
Africa	BMGF, UK	2
Africa	Italy	2
Africa	USAID	2
Africa	AfDB, FAO	1
Africa	Congo	1
Africa	JICA	1
Africa	Netherlands	1
Africa	UNECA	1
Africa	WFP	1
Asia & Pacific	UK	20
Asia & Pacific	FAO	10
Asia & Pacific	EU	4
Asia & Pacific	ADB	2

Region	donor	total
Asia & Pacific	BMGF	2
Asia & Pacific	Japan	2
Asia & Pacific	Australia, Sweden, USA	1
Asia & Pacific	Multilateral	1
Asia & Pacific	Sweden	1
Asia & Pacific	USAID	1
CIS	USAID	2
CIS	EU	1
CIS	FAO	1
CIS	Italy	1
CIS	Romania	1
CIS	U.S. State Department	1
CIS	UNDP	1
CIS	WB	1
CIS	World Bank	1
Global	UK	2
Global	Belgium	1
Global	BMGF	1
Global	BMGF, UK, Italy	1
Global	FAO	1
Global	Japan	1
Global	Turkey	1
LAC	FAO	10
LAC	EU	1
LAC	IADB	1
LAC	Italy	1
LAC	USAID	1
Near East	EU	3
Near East	Multilateral, UK	1

Top donors by # projects

Seems redundant after last table

National level filtered for national level projects

Top (say 5?) donors by budget, or more if the last few are close

```
nat <- filter(data, supportType == "National")

nat.donor <- nat %>%
                group_by(donor) %>%
                summarize(totalBudget = sum(budget))

tab <- arrange(nat.donor, desc(totalBudget))
knitr::kable(tab)
```

donor	totalBudget
EU	84048962
IADB	15000000
BMGF	9906508
USAID	9832264
FAO	9345454
Congo	7652668
JICA	5000000
Australia, Sweden, USA	3750000
UK	2887500
Italy	2001877
WFP	1830540
Japan	1830342
U.S. State Department	1750000
AfDB, FAO	1670938
Sweden	1228275
Romania	686810
Netherlands	445994
Turkey	330000
UNECA	260000
World Bank	200000
UNDP	19000

Top donors by # projects

```
nat.donor <- nat %>%
                group_by(donor) %>%
                summarize(totalProjects = n())

tab <- arrange(nat.donor, desc(totalProjects))
knitr::kable(tab)
```

donor	totalProjects
FAO	41
EU	18
UK	18
USAID	6
BMGF	5
Italy	2
Japan	2
AfDB, FAO	1
Australia, Sweden, USA	1
Congo	1
IADB	1
JICA	1
Netherlands	1
Romania	1
Sweden	1
Turkey	1
U.S. State Department	1

donor	totalProjects
UNDP	1
UNECA	1
WFP	1
World Bank	1

Africa filtered for projects with Region = africa

Total $ committed

```
africa <- filter(data, Region == "Africa")

sum(africa$budget)
```

```
## [1] 101817545
```

Total FAO as donor & implementer

```
fao.af <- filter(africa, donor == "FAO" & implementer == "FAO")

sum(fao.af$budget)
```

```
## [1] 5825812
```

Top (say 5?) donors by budget, or more if the last few are close

```
af.donor <- africa %>%
                  group_by(donor) %>%
                  summarize(totalBudget = sum(budget))

tab <- arrange(af.donor, desc(totalBudget))
knitr::kable(tab)
```

donor	totalBudget
EU	53437192
BMGF	8175199
Congo	7652668
BMGF, UK	7587769
FAO	5825812
JICA	5000000
USAID	4702000
Japan	3227556
Italy	2001877
WFP	1830540

donor	totalBudget
AfDB, FAO	1670938
Netherlands	445994
UNECA	260000

Top donors by # projects

```
af.donor <- africa %>%
                  group_by(donor) %>%
                  summarize(totalProject = n())

tab <- arrange(af.donor, desc(totalProject))
knitr::kable(tab)
```

donor	totalProject
FAO	20
EU	9
BMGF	3
Japan	3
BMGF, UK	2
Italy	2
USAID	2
AfDB, FAO	1
Congo	1
JICA	1
Netherlands	1
UNECA	1
WFP	1

Asia filtered for projects with Region = africa

Total $ committed

```
asia <- filter(data, Region == "Asia & Pacific")

sum(asia$budget)
```

```
## [1] 36958348
```

Total FAO as donor & implementer

```
fao.af <- filter(asia, donor == "FAO" & implementer == "FAO")

sum(fao.af$budget)
```

```
## [1] 2455100
```

Top (say 5?) donors by budget, or more if the last few are close

```
af.donor <- asia %>%
                  group_by(donor) %>%
                  summarize(totalBudget = sum(budget))

tab <- arrange(af.donor, desc(totalBudget))
knitr::kable(tab)
```

donor	totalBudget
EU	14376231
UK	6162307
Australia, Sweden, USA	3750000
ADB	2500000
FAO	2455100
Japan	1995142
BMGF	1731309
USAID	1500000
Multilateral	1259984
Sweden	1228275

Top donors by # projects

```
af.donor <- asia %>%
                  group_by(donor) %>%
                  summarize(totalProject = n())

tab <- arrange(af.donor, desc(totalProject))
knitr::kable(tab)
```

donor	totalProject
UK	20
FAO	10
EU	4
ADB	2
BMGF	2
Japan	2
Australia, Sweden, USA	1
Multilateral	1
Sweden	1
USAID	1

Countries with multiple donors – to showcase coordination & synergy

List of donors – (global, regional, national activities)

```
#filter for only projects which could be allocated to a country
c <- filter(data, assCountry == 1)
c <- select(c, donor, country)

#assign countries to set of donors first
x1 <- strsplit(c$country,",") #create list

#apply donor as names to list
names(x1) <- c$donor

#convert each element of list to df and apply to names as col
x1 = lapply(names(x1), function(name){
  data.frame(donors = name,
             country = x1[[name]])
})

x1.df <- do.call("rbind", x1)
x1.df$donors <- as.character(x1.df$donors)

#Now reverse the process to apply to key
x2 <- strsplit(x1.df$donors,",")

#apply donor as names to list
names(x2) <- x1.df$country

#convert each element of list to df and apply to names as col
x2 = lapply(names(x2), function(name){
  data.frame(country = name,
             donor = x2[[name]])
})

final.df <- do.call("rbind", x2)
```

```
nat.donor <- nat %>%
                group_by(donor) %>%
                summarize(totalProjects = n())

tab <- arrange(nat.donor, desc(totalProjects))
knitr::kable(tab)
```

donor	totalProjects
FAO	41
EU	18
UK	18
USAID	6
BMGF	5

donor	totalProjects
Italy	2
Japan	2
AfDB, FAO	1
Australia, Sweden, USA	1
Congo	1
IADB	1
JICA	1
Netherlands	1
Romania	1
Sweden	1
Turkey	1
U.S. State Department	1
UNDP	1
UNECA	1
WFP	1
World Bank	1

Africa filtered for projects with Region = africa

Total $ committed

```
africa <- filter(data, Region == "Africa")

sum(africa$budget)
```

```
## [1] 101817545
```

Total FAO as donor & implementer

```
fao.af <- filter(africa, donor == "FAO" & implementer == "FAO")

sum(fao.af$budget)
```

```
## [1] 5825812
```

Top (say 5?) donors by budget, or more if the last few are close

```
af.donor <- africa %>%
                  group_by(donor) %>%
                  summarize(totalBudget = sum(budget))

tab <- arrange(af.donor, desc(totalBudget))
knitr::kable(tab)
```

donor	totalBudget
EU	53437192
BMGF	8175199
Congo	7652668
BMGF, UK	7587769
FAO	5825812
JICA	5000000
USAID	4702000
Japan	3227556
Italy	2001877
WFP	1830540
AfDB, FAO	1670938
Netherlands	445994
UNECA	260000

Top donors by # projects

```
af.donor <- africa %>%
                  group_by(donor) %>%
                  summarize(totalProject = n())

tab <- arrange(af.donor, desc(totalProject))
knitr::kable(tab)
```

donor	totalProject
FAO	20
EU	9
BMGF	3
Japan	3
BMGF, UK	2
Italy	2
USAID	2
AfDB, FAO	1
Congo	1
JICA	1
Netherlands	1
UNECA	1
WFP	1

Asia filtered for projects with Region = africa

Total $ committed

```
asia <- filter(data, Region == "Asia & Pacific")

sum(asia$budget)
```

```
## [1] 36958348
```

Total FAO as donor & implementer

```
fao.af <- filter(asia, donor == "FAO" & implementer == "FAO")

sum(fao.af$budget)
```

```
## [1] 2455100
```

Top (say 5?) donors by budget, or more if the last few are close

```
#create maps and figures for analysis
#http://www.kateto.net/wordpress/wp-content/uploads/2015/06/Polnet%202015%20Network%20Viz%20Tutorial%20

#-- import data and package


# data <- read.csv(paste0(data.dir,"agstats_final_130116.csv"),
#                  stringsAsFactors = FALSE)

data <- read.csv(paste0(data.dir,"agstats_final_for narrative.csv"),
                 stringsAsFactors = FALSE)
source("R/cleanFigures.R")
data <- cleanFigures(data)

##THIS INTRODUCES NAs IN BUDGET B/C LESLIE INCLUDED SOME TEXT


#---CONFIGURE DATAFRAME FOR ANALYSIS, LIMIT TO ONLY PROJECTS ALLOCATED TO COUNTRIES

#Get expenditure data
test.c <- colnames(data) %in% NA
data <- data[!test.c]


#take only baby project and NA
data.c <- filter(data, is.na(baby) | baby == 1)

#remove VoH, GS, and CARDS -  WANT TO INCLUDE IN NETWORK ANALYSIS
#data.c <- filter(data.c, GsVohCard == 0)

#remove 'Unallocated' countries
data.c <- filter(data.c, country != "Unallocated")

##############################################################################################################

###########################
# -- CREATE BIPARTITE -- #
###########################
```

```
data.c$donor[data.c$donor %in% c("USAID","U.S. State Department")] <- "USA"
temp <- data.c
#select only needed variables
temp <- select(temp,donor,country,budget)
temp$country[temp$country == "C\xf4te d'Ivoire"] <- "Cote d'Ivoire"


#remove NA budgets
temp <- filter(temp, !is.na(budget))

#add unique key to each project for merging later
temp$key <- paste0("key",1:nrow(temp))

#split countries for more than one country, two times for using
# key and budget as names
x1 <- strsplit(temp$country,",")

#add a denominator to temp based on # of countries
temp$denom <- sapply(x1,length)
temp$totl <- temp$budget/temp$denom

#get rid of scientific notation
options(scipen = 999)

names(x1) <- temp$key

x1 = lapply(names(x1), function(name){
  data.frame(key = name,
             country = x1[[name]])
})

countries <- do.call("rbind", x1)

budget <- select(temp,key,totl, donor)

master <- merge(countries,budget, by = "key", all = TRUE)
master <- select(master,country,donor,totl,key)
master <- arrange(master, country)
master$country <- countrycode(master$country,
                              origin = "country.name",
                              destination = "country.name")



##################
##CREATE NODES ##
##################
donors.df <- data.frame(name = unique(master$donor),
                        type = rep('donor', n = nrow(master)))

countries.df <- data.frame(name = unique(as.character(master$country)),
                           type = rep('country',
                                      n = length(unique(master$country))))
```

```
nodes <- rbind(donors.df,countries.df)
nodes$name <- as.character(nodes$name)

nodes$id <- paste0("id",1:nrow(nodes))
nodes <- select(nodes, id, name, type)

nodes$type <- as.character(nodes$type)
nodes$name <- as.character(nodes$name)
nodes$name.type[nodes$type == "donor"] <- 1
nodes$name.type[nodes$type == "country"] <- 2

nodes$name1[nodes$name.type == 2] <- countrycode(nodes$name[nodes$name.type == 2],
                                                 origin = "country.name",
                                                destination = "country.name")



nodes$name1[nodes$name.type == 1] <- nodes$name[nodes$name.type == 1]

nodes$name <- nodes$name1
nodes <- select(nodes, - length(nodes))


#add continent column

region.df <- select(countrycode_data,country.name,continent)


nodes.country <- merge(nodes[nodes$name.type == 2,], region.df, by.x = "name", by.y = "country.name")

nodes.donor <- filter(nodes, name.type == 1)
nodes.donor$continent  <- rep("Donor",n = nrow(nodes.donor))

nodes <- rbind(nodes.country,nodes.donor)

nodes <- select(nodes,id,name,name.type,type,continent)
unique(nodes$continent)
```

```
## [1] "Asia"     "Africa"   "Americas" "Oceania"  "Europe"   "Donor"
```

```
nodes$continent.type[nodes$continent == "Asia"] <- 1
nodes$continent.type[nodes$continent == "Africa"] <- 2
nodes$continent.type[nodes$continent == "Americas"] <- 3
nodes$continent.type[nodes$continent == "Oceania"] <- 4
nodes$continent.type[nodes$continent == "Europe"] <- 5
nodes$continent.type[nodes$continent == "Donor"] <- 6

###################
##CREATE LINKS
###################
links <- select(master,country,donor,totl)
temp <- select(nodes,id, name)
```

```
##merge ids for countries & rename
links <- merge(links,temp, by.x = "country", by.y = "name")
names(links)[names(links)== "id"] = "to"

##merge ids for donors
links <- merge(links,temp, by.x = "donor", by.y = "name")
names(links)[names(links)== "id"] = "from"


links <- select(links, to, from, totl)
names(links)[names(links)== "totl"] = "weight"
links <- select(links, from, to, weight)

#nrow(links); nrow(unique(links[,c("from", "to")])) #MORE LINKS THAN UNIQUE TO/FR
links <- aggregate(links[,3], links[,-3], sum)
links <- links[order(links$from, links$to),]
colnames(links)[3] <- "weight"
rownames(links) <- NULL

########################
## add faoClass       ##
########################
source("R/faoClass.R")
nodes <- faoClass(nodes = nodes, links = links)

####################################
## CREATE OBJECT GLOBAL BIPARTITE ##
##        NO WEIGHTS              ##
####################################
net <- graph.data.frame(links, nodes, directed=T)
net <- simplify(net, remove.multiple = F, remove.loops = T)

#set colors by region and layout
pal <- terrain.colors(6, alpha = .8)
colrs <- pal
V(net)$color <- colrs[V(net)$continent.type]

l <- layout.fruchterman.reingold(net, repulserad=vcount(net)^4,
                                 area=vcount(net)^2.4)
```

```
## Warning in layout_with_fr(structure(list(107, TRUE, c(1, 1, 1, 11, 12,
## 12, : Argument `area' is deprecated and has no effect
```

```
## Warning in layout_with_fr(structure(list(107, TRUE, c(1, 1, 1, 11, 12,
## 12, : Argument `repulserad' is deprecated and has no effect
```

```
set.seed(28)
# plot(net, layout=layout.fruchterman.reingold,
#           edge.arrow.size=.2,
#           edge.arrow.mode = 0)
# legend(x=1, y= -.5,c("Asia","Africa","Americas",
#                          "Oceania","Europe","DONOR"),
```

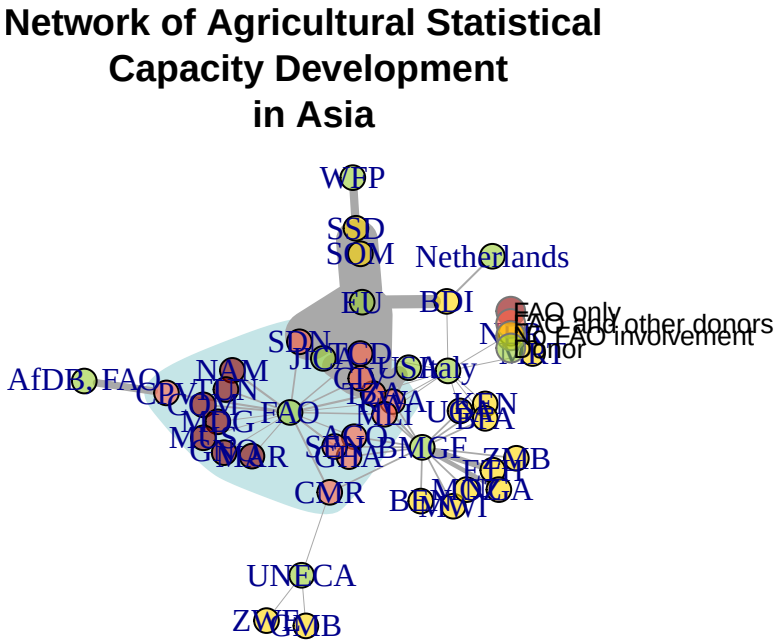
```
#       pch=21,col="#777777",pt.bg=colrs,pt.cex=2,cex=.8,bty="n",ncol=1,
#       box.lwd = .1, x.intersp = .2, y.intersp = .2)
#


####INSERT ISO3 CODES
source("R/convertIso.R")
nodes <- convertIso(df = nodes)


#####################################
## CREATE OBJECT AFRICA BIPARTITE ##
##        WEIGHTED LINKS           ##
#####################################
nodes.af <- filter(nodes, continent.type == 2 | continent.type == 6)
links.af <- links

#HACK TO REMOVE TURKEY and congo B/C LISTED AS DONOR AND COUNTRY
congo.id <- nodes.af$id[nodes.af$name == "Congo"]

nodes.af <- filter(nodes.af, name != "Turkey")
nodes.af <- filter(nodes.af, name != "Congo")
nodes.af <- filter(nodes.af, name != "COG")


links.af <- filter(links.af, from != congo.id)

#filter links to be sure links are in nodes
links.test <- links.af$to %in% nodes.af$id
links.af <- links.af[links.test,]

#filter out unused donors
nodes.test <- (nodes.af$continent.type == 6) & !(nodes.af$id %in% links.af$from)
nodes.af <- filter(nodes.af, !nodes.test)

#create bipartite object
net <- graph.data.frame(links.af, nodes.af, directed=T)
net <- simplify(net, remove.multiple = F, remove.loops = T)

#set colors
colrs = adjustcolor(c("darkred", "tomato","gold","yellowgreen"), alpha = .6)

#set weights
E(net)$width <-E(net)$weight/(exp(13)) # set weights!

#define shaded region
fao.test <- nodes.af$name[nodes.af$faoClass %in% c(1,2)]
vert <- names(V(net))
mark <- grep("TRUE",vert %in% fao.test)


# set layout
set.seed(3200)
```

```
#set.seed(31)
#set.seed(30)
l <- layout.fruchterman.reingold(net, repulserad=vcount(net)^4,
                                 area=vcount(net)^2.4)
```

```
## Warning in layout_with_fr(structure(list(44, TRUE, c(34, 34, 34, 35, 35, :
## Argument `area' is deprecated and has no effect
```

```
## Warning in layout_with_fr(structure(list(44, TRUE, c(34, 34, 34, 35, 35, :
## Argument `repulserad' is deprecated and has no effect
```

```
# plot
plot(net,
     edge.arrow.size=.2,
     edge.arrow.mode = 0,
     layout = l,
     vertex.color = colrs[V(net)$faoClass],
     vertex.size = 11,
     #vertex.label.family = "Arial",
     mark.groups = mark, mark.col = "#C5E5E7", mark.border = NA,
     main = "Network of Agricultural Statistical \n Capacity Development \n in Asia")
legend(x=.8, y= .5,c("FAO only","FAO and other donors","No FAO involvement",
                     "Donor"),
                       pch=21,col="#777777",pt.bg=colrs,pt.cex=2,cex=.8,bty="n",ncol=1,
                       box.lwd = .1, x.intersp = .1, y.intersp = .4)
```



Total $ committed – (global, regional, national activities)