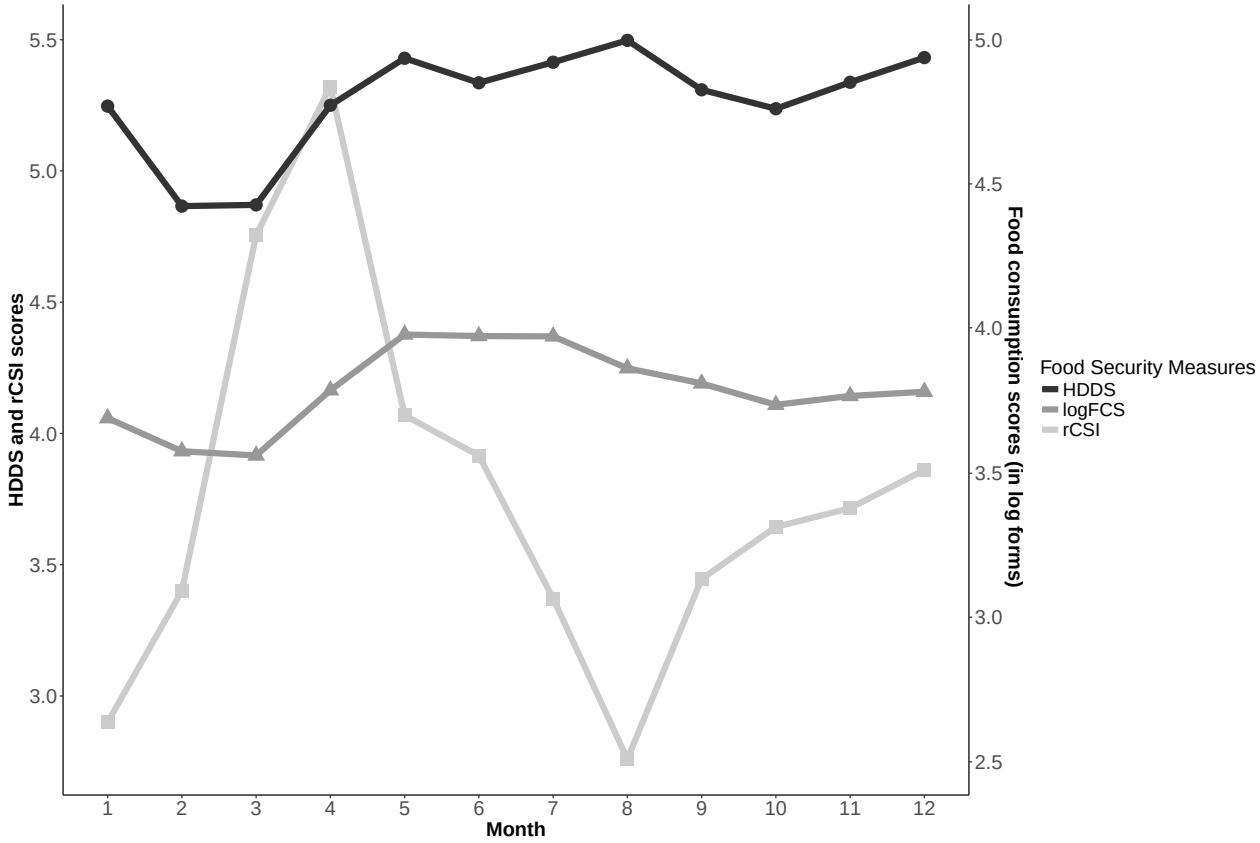
Result_writeup

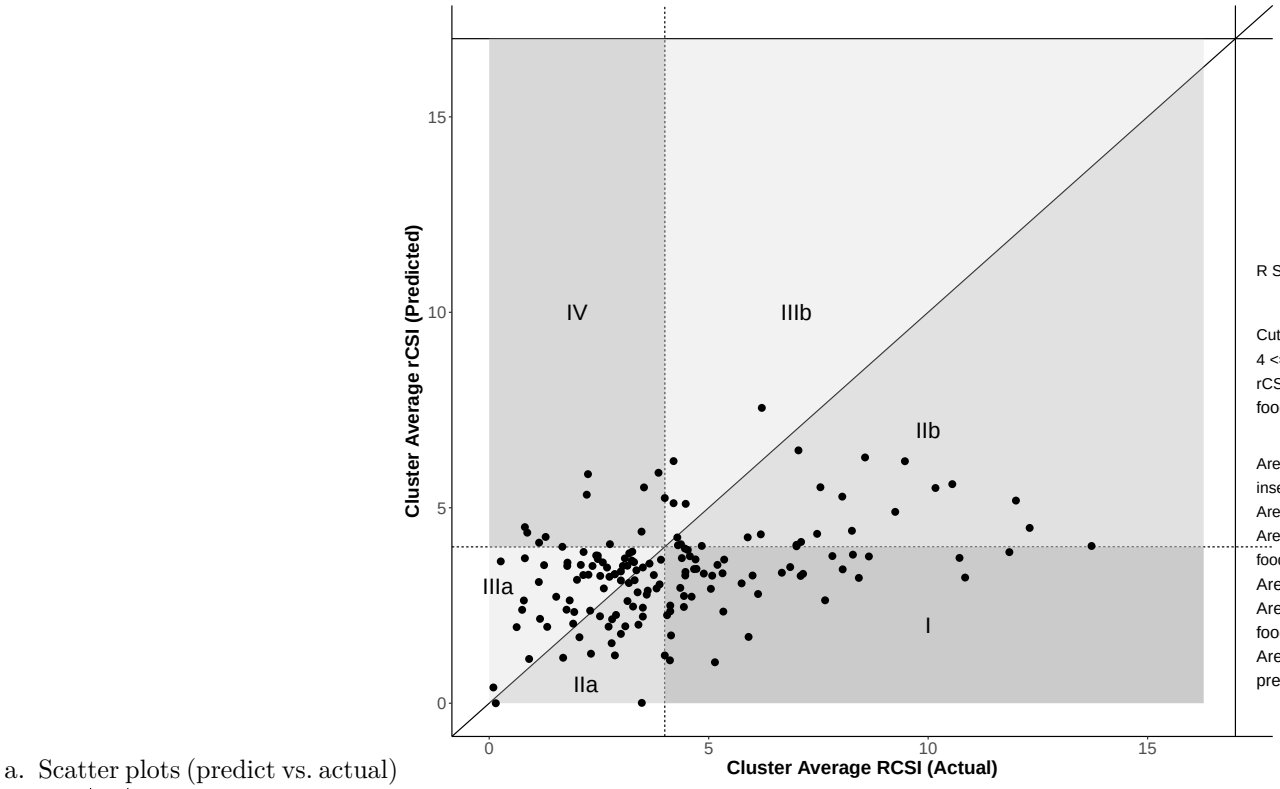
1. summary stats (pooled data of 2010 and 2013)

a. `FS by month plot`

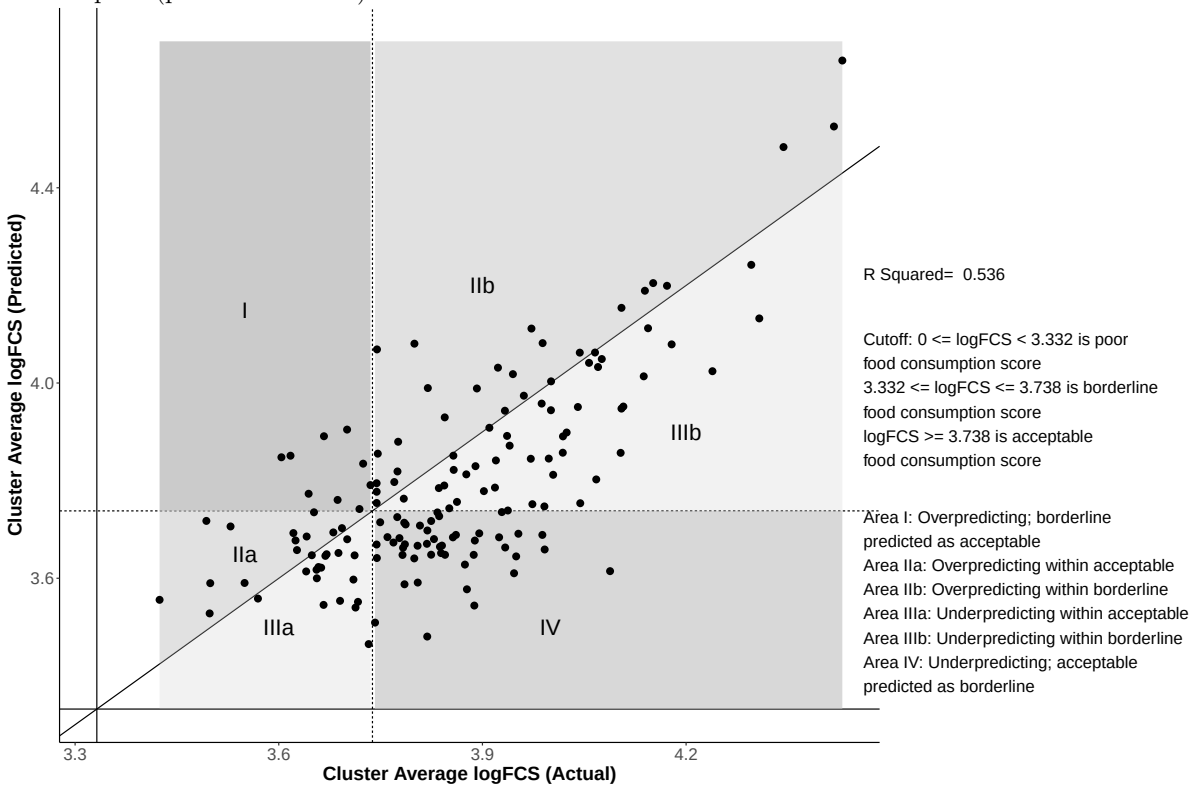


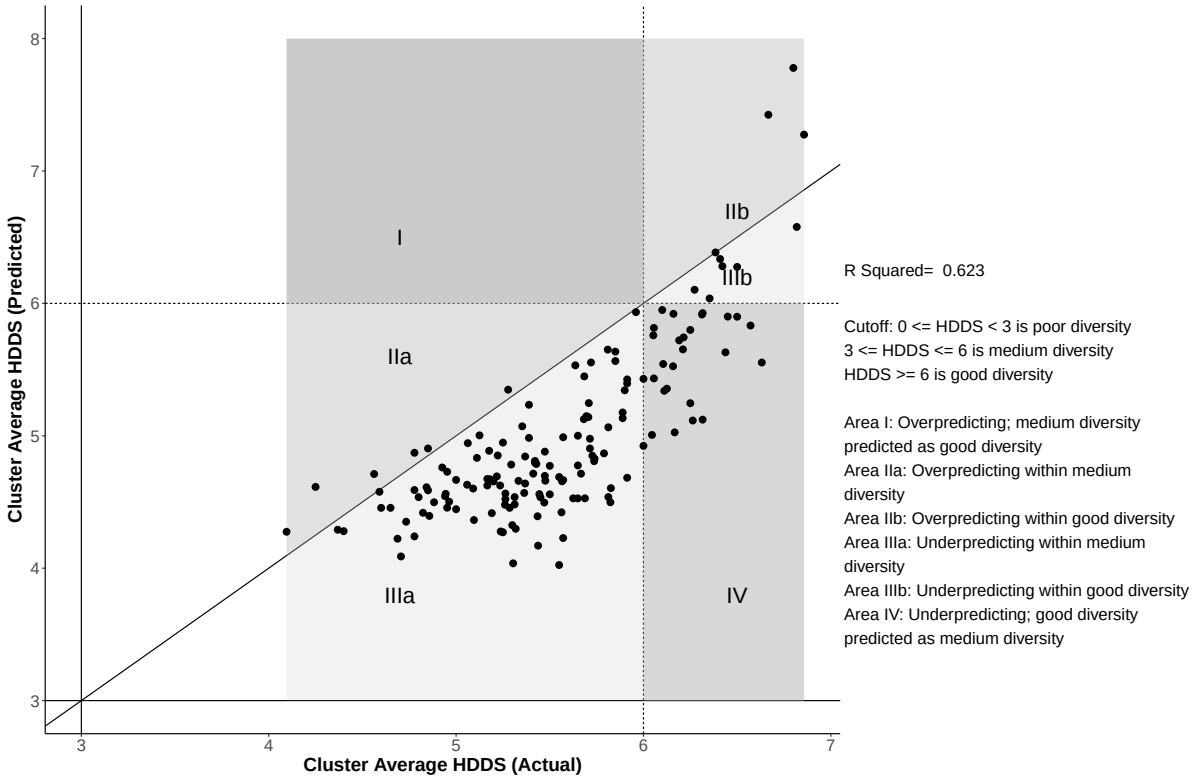
b. `bar chart of variation`

2. Result of 2013 prediction



a. Scatter plots (predict vs. actual)





b. Scatter plots (predict vs. actual) plus ipc only value

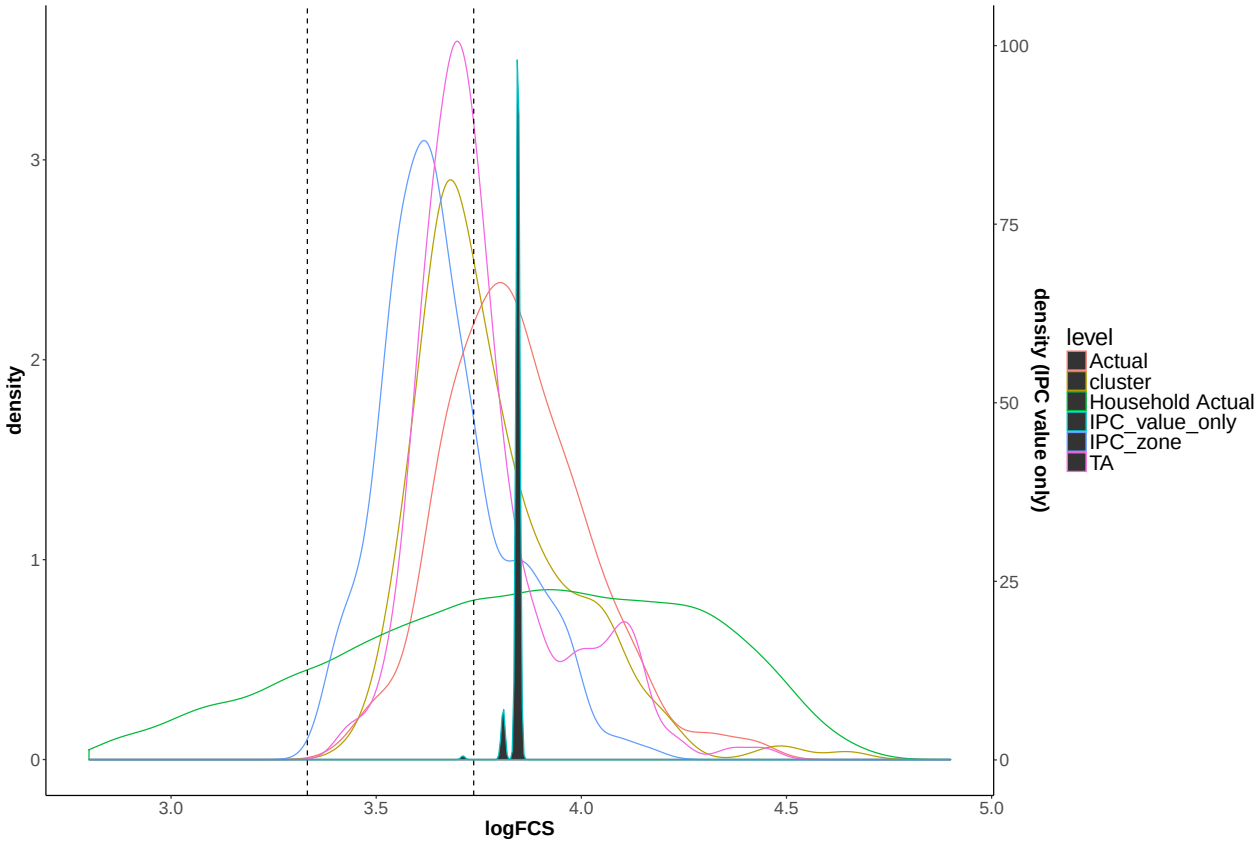
c. Density plot (predication using different scales + household)

   i. Unexplored variation of household level

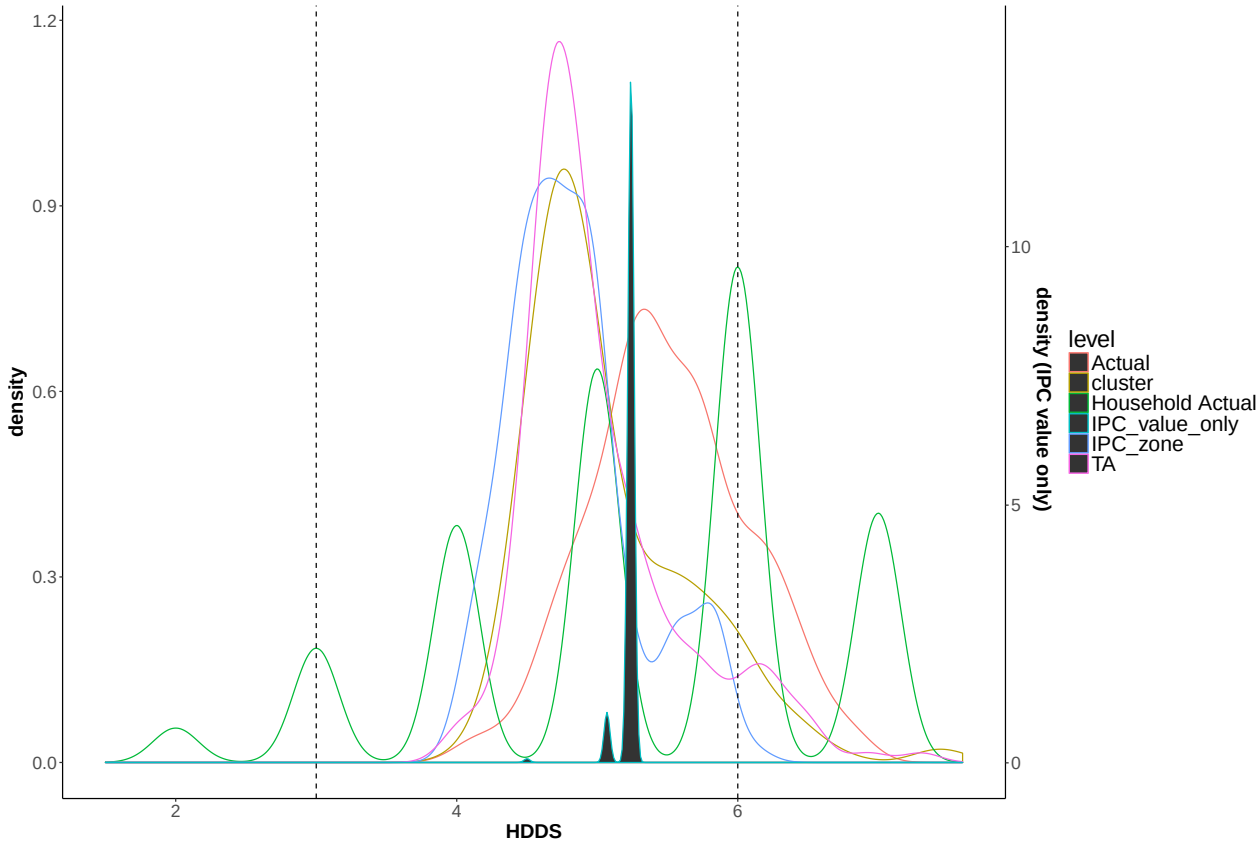
```
## <environment: R_GlobalEnv>

## Warning in cbind(predict_df$clust_logFCS_ipczone_predict_m3, predict_df
## $clust_logFCS_TA_predict_m3, : number of rows of result is not a multiple
## of vector length (arg 1)

## Warning in bind_rows_(x, .id): binding factor and character vector,
## coercing into character vector

## Warning in bind_rows_(x, .id): binding character and factor vector,
## coercing into character vector

## Warning in cbind(predict_df$clust_HDDS_ipczone_predict_m3, predict_df
## $clust_HDDS_TA_predict_m3, : number of rows of result is not a multiple of
## vector length (arg 1)

## Warning in bind_rows_(x, .id): binding factor and character vector,
## coercing into character vector

## Warning in bind_rows_(x, .id): binding character and factor vector,
## coercing into character vector

## Warning in cbind(predict_df$clust_RCSI_ipczone_predict_m3, predict_df
## $clust_RCSI_TA_predict_m3, : number of rows of result is not a multiple of
## vector length (arg 1)

## Warning in bind_rows_(x, .id): binding factor and character vector,
## coercing into character vector
```

```
## Warning in bind_rows_(x, .id): binding character and factor vector,
## coercing into character vector
```

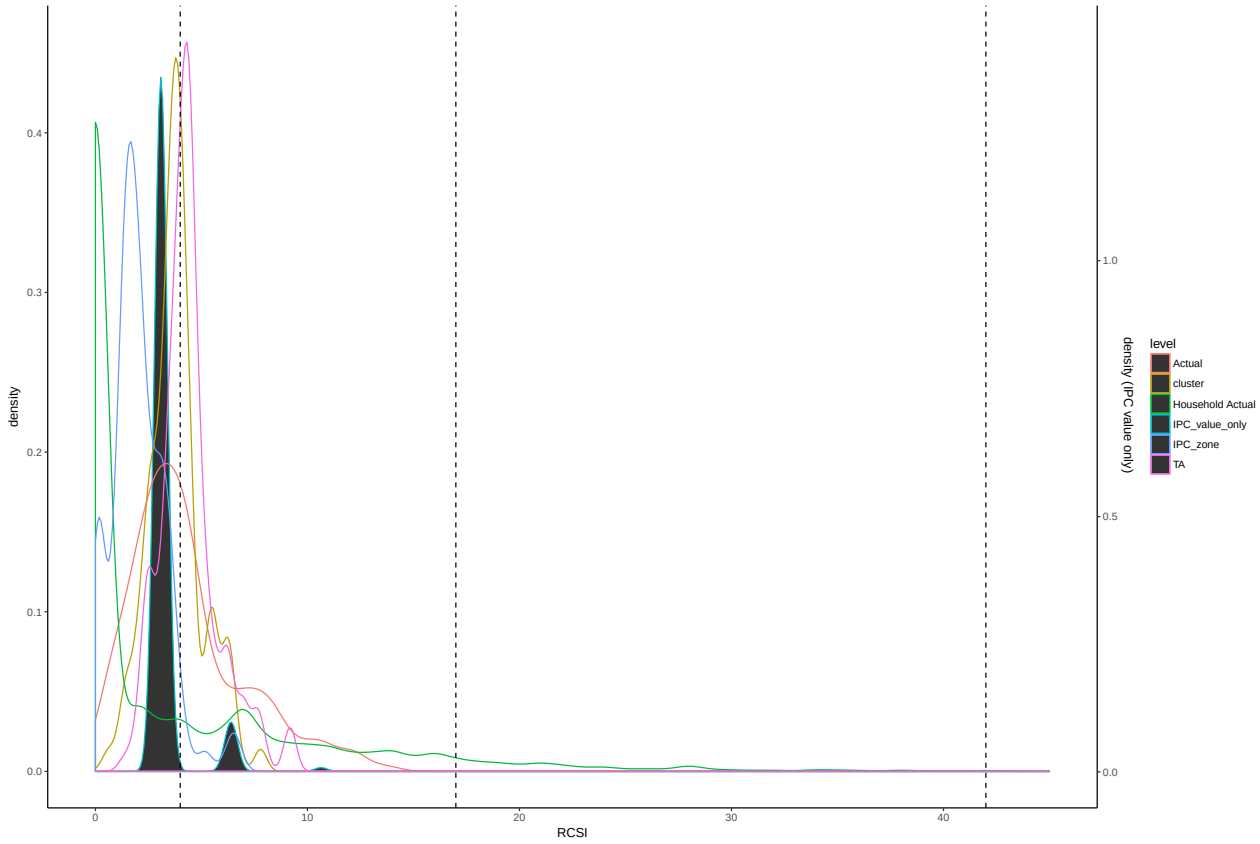
```
## Warning: Removed 423 rows containing non-finite values (stat_density).
```




```
## Warning: Removed 7 rows containing non-finite values (stat_density).
```




```
## Warning: Removed 40 rows containing non-finite values (stat_density).
```

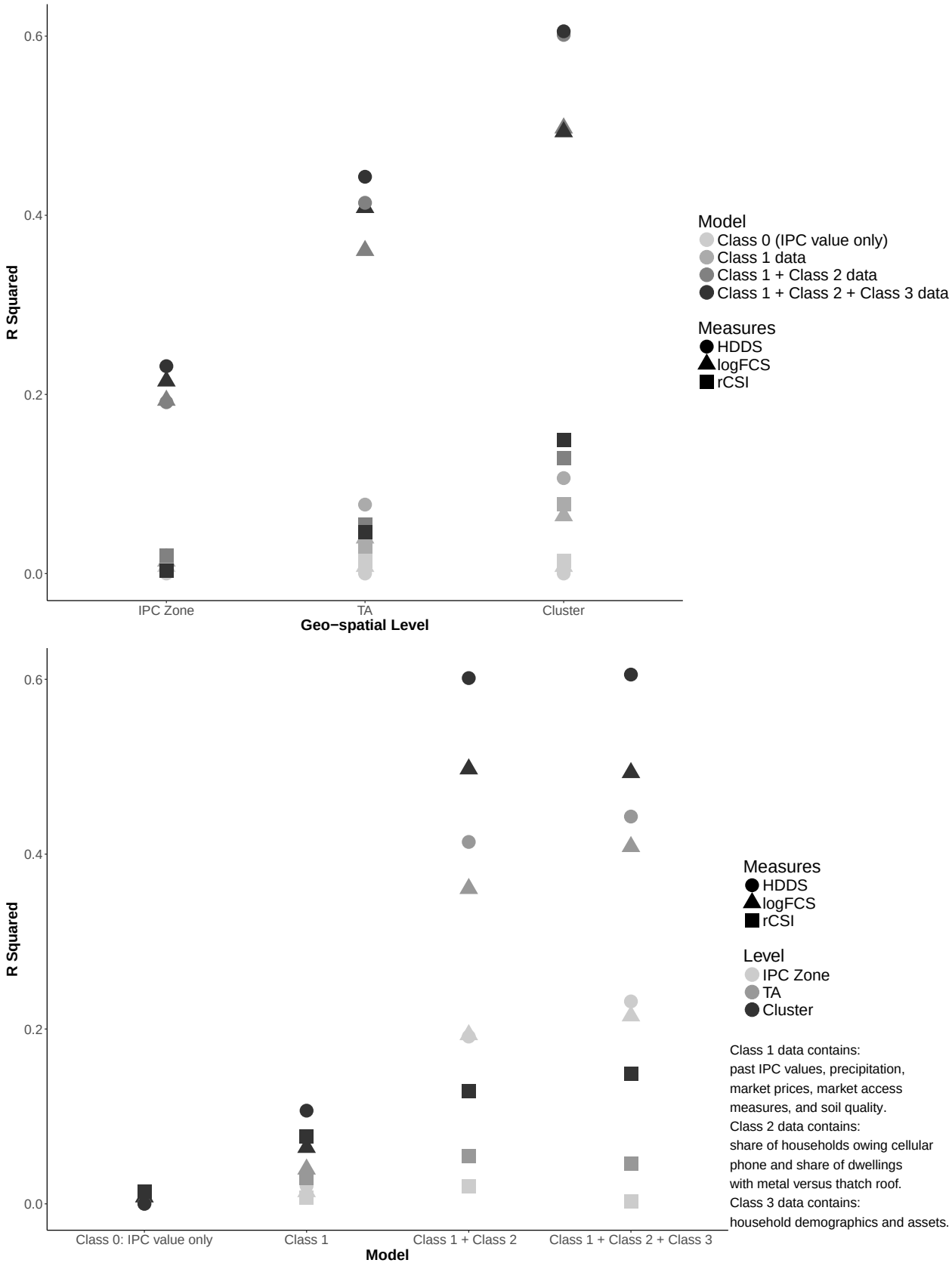


d. R Squared of 2013 predication

```
## Warning in cbind(logFCS_IPC$clust_logFCS_predict_ipc, logFCS_IPC
## $clust_logFCS_predict_ipc, : number of rows of result is not a multiple of
## vector length (arg 4)
```

```
## Warning in cbind(HDDS_IPC$clust_HDDS_predict_ipc, HDDS_IPC
## $clust_HDDS_predict_ipc, : number of rows of result is not a multiple of
## vector length (arg 4)
```

```
## Warning in cbind(RCSI_IPC$clust_RCSI_predict_ipc, RCSI_IPC
## $clust_RCSI_predict_ipc, : number of rows of result is not a multiple of
## vector length (arg 4)
```



f. Discussion of classification

g. hit and miss tables (for the predications)
    i. one is cluster to actual cluster outcomes

```
## Loading required package: lattice

## Warning in as.POSIXlt.POSIXct(Sys.time()): unknown timezone 'zone/tz/2018c.
## 1.0/zoneinfo/America/Chicago'

## [1] 0.3012821

## [1] 0.6987179

## [1] 0.1217949

## [1] 0.8782051

## [1] 0.4358974

## [1] 0.5641026

## [1] "logFCS confusionMatrix"

## Confusion Matrix and Statistics
##
##             Reference
## Prediction   Poor Borderline Acceptable
##   Poor          0          0          0
##   Borderline    0         31         50
##   Acceptable    0          9         66
##
## Overall Statistics
##
##                Accuracy : 0.6218
##                  95% CI : (0.5408, 0.6981)
##     No Information Rate : 0.7436
##     P-Value [Acc > NIR] : 0.9997
##
##                   Kappa : 0.2575
##  Mcnemar's Test P-Value : NA
##
## Statistics by Class:
##
##                      Class: Poor Class: Borderline Class: Acceptable
## Sensitivity                   NA            0.7750            0.5690
## Specificity                    1            0.5690            0.7750
## Pos Pred Value                NA            0.3827            0.8800
## Neg Pred Value                NA            0.8800            0.3827
## Prevalence                     0            0.2564            0.7436
## Detection Rate                 0            0.1987            0.4231
## Detection Prevalence           0            0.5192            0.4808
## Balanced Accuracy             NA            0.6720            0.6720

## [1] "HDDS confusionMatrix"

## Confusion Matrix and Statistics
##
##                   Reference
## Prediction         Low Diversity Medium Diversity Good Diversity
##   Low Diversity                0                0              0
##   Medium Diversity             0              120             20
```

```
##   Good Diversity               0                1             15
##
## Overall Statistics
##
##                Accuracy : 0.8654
##                  95% CI : (0.8016, 0.9147)
##     No Information Rate : 0.7756
##     P-Value [Acc > NIR] : 0.003282
##
##                   Kappa : 0.5208
##  Mcnemar's Test P-Value : NA
##
## Statistics by Class:
##
##                      Class: Low Diversity Class: Medium Diversity
## Sensitivity                            NA                  0.9917
## Specificity                             1                  0.4286
## Pos Pred Value                         NA                  0.8571
## Neg Pred Value                         NA                  0.9375
## Prevalence                              0                  0.7756
## Detection Rate                          0                  0.7692
## Detection Prevalence                    0                  0.8974
## Balanced Accuracy                      NA                  0.7102
##                      Class: Good Diversity
## Sensitivity                        0.42857
## Specificity                        0.99174
## Pos Pred Value                     0.93750
## Neg Pred Value                     0.85714
## Prevalence                         0.22436
## Detection Rate                     0.09615
## Detection Prevalence               0.10256
## Balanced Accuracy                  0.71015
```

```
## [1] "RCSI confusionMatrix"
```

```
## Confusion Matrix and Statistics
##
##              Reference
## Prediction    Food Secure Mild Moderate Severe
##   Food Secure          69   37        0      0
##   Mild                 18   32        0      0
##   Moderate              0    0        0      0
##   Severe                0    0        0      0
##
## Overall Statistics
##
##                Accuracy : 0.6474
##                  95% CI : (0.567, 0.7221)
##     No Information Rate : 0.5577
##     P-Value [Acc > NIR] : 0.01417
##
##                   Kappa : 0.2644
##  Mcnemar's Test P-Value : NA
##
## Statistics by Class:
```

```
##
##                      Class: Food Secure Class: Mild Class: Moderate
## Sensitivity                      0.7931      0.4638              NA
## Specificity                      0.4638      0.7931               1
## Pos Pred Value                   0.6509      0.6400              NA
## Neg Pred Value                   0.6400      0.6509              NA
## Prevalence                       0.5577      0.4423               0
## Detection Rate                   0.4423      0.2051               0
## Detection Prevalence             0.6795      0.3205               0
## Balanced Accuracy                0.6284      0.6284              NA
##                      Class: Severe
## Sensitivity                     NA
## Specificity                      1
## Pos Pred Value                  NA
## Neg Pred Value                  NA
## Prevalence                       0
## Detection Rate                   0
## Detection Prevalence             0
## Balanced Accuracy               NA
```

ii. cluster predication to actual household level outcomes

```
## [1] "logFCS confusionMatrix"
```

```
## Confusion Matrix and Statistics
##
##             Reference
## Prediction   Poor Borderline Acceptable
##   Poor          0          0          0
##   Borderline  172        436        637
##   Acceptable   73        245        920
##
## Overall Statistics
##
##                Accuracy : 0.5461
##                  95% CI : (0.5263, 0.5658)
##     No Information Rate : 0.6271
##     P-Value [Acc > NIR] : 1
##
##                   Kappa : 0.1745
##  Mcnemar's Test P-Value : <2e-16
##
## Statistics by Class:
##
##                      Class: Poor Class: Borderline Class: Acceptable
## Sensitivity              0.00000            0.6402            0.5909
## Specificity              1.00000            0.5511            0.6566
## Pos Pred Value               NaN            0.3502            0.7431
## Neg Pred Value           0.90133            0.8021            0.4884
## Prevalence               0.09867            0.2743            0.6271
## Detection Rate           0.00000            0.1756            0.3705
## Detection Prevalence     0.00000            0.5014            0.4986
## Balanced Accuracy        0.50000            0.5956            0.6237
```

```
## [1] "HDDS confusionMatrix"
```

```
## Confusion Matrix and Statistics
##
##                   Reference
## Prediction         Low Diversity Medium Diversity Good Diversity
##   Low Diversity                0                0              0
##   Medium Diversity           246             1709            368
##   Good Diversity               1               55            104
##
## Overall Statistics
##
##                Accuracy : 0.7302
##                  95% CI : (0.7122, 0.7475)
##     No Information Rate : 0.7104
##     P-Value [Acc > NIR] : 0.01548
##
##                   Kappa : 0.1649
##  Mcnemar's Test P-Value : < 2e-16
##
## Statistics by Class:
##
##                      Class: Low Diversity Class: Medium Diversity
## Sensitivity                       0.00000                 0.9688
## Specificity                       1.00000                 0.1460
## Pos Pred Value                        NaN                 0.7357
## Neg Pred Value                    0.90052                 0.6562
## Prevalence                        0.09948                 0.7104
## Detection Rate                    0.00000                 0.6883
## Detection Prevalence              0.00000                 0.9356
## Balanced Accuracy                 0.50000                 0.5574
##                      Class: Good Diversity
## Sensitivity                        0.22034
## Specificity                        0.97215
## Pos Pred Value                     0.65000
## Neg Pred Value                     0.84158
## Prevalence                         0.19009
## Detection Rate                     0.04188
## Detection Prevalence               0.06444
## Balanced Accuracy                  0.59625
```

```
## [1] "RCSI confusionMatrix"
```

```
## Confusion Matrix and Statistics
##
##              Reference
## Prediction    Food Secure Mild Moderate Severe
##   Food Secure        1463  352       61      0
##   Mild                408  147       52      0
##   Moderate              0    0        0      0
##   Severe                0    0        0      0
##
## Overall Statistics
##
##                Accuracy : 0.6484
##                  95% CI : (0.6293, 0.6672)
##     No Information Rate : 0.7535
```

```
##     P-Value [Acc > NIR] : 1
##
##                   Kappa : 0.0785
##  Mcnemar's Test P-Value : NA
##
## Statistics by Class:
##
##                      Class: Food Secure Class: Mild Class: Moderate
## Sensitivity                      0.7819      0.2946         0.00000
## Specificity                      0.3252      0.7681         1.00000
## Pos Pred Value                   0.7799      0.2422             NaN
## Neg Pred Value                   0.3278      0.8124         0.95449
## Prevalence                       0.7535      0.2010         0.04551
## Detection Rate                   0.5892      0.0592         0.00000
## Detection Prevalence             0.7555      0.2445         0.00000
## Balanced Accuracy                0.5535      0.5314         0.50000
##                      Class: Severe
## Sensitivity                     NA
## Specificity                      1
## Pos Pred Value                  NA
## Neg Pred Value                  NA
## Prevalence                       0
## Detection Rate                   0
## Detection Prevalence             0
## Balanced Accuracy               NA
```

1. how bad it can be to just target the cluster level ?

2. put it in SI ?

3. 2010 data (only what matters for 2010 is the tables (coefficients and variables))

   a. regression results

   b. discussion on the coefficients