

Esso Exploration & Production Chad Inc.

Land Use Mitigation Action Plan

**Annual Individual Livelihood Restoration
Report
2009**

28 February 2010

List of Acronyms & terms used in this report

HH	Household.
HHH	Household Chief (Chef de Ménage(CdM))
HHM	Household Member. Include the CdM and all its dependents, regardless of their age.
Eligible	Generic term to designate an individual that may be eligible to the EMP Resettlement Program.
Potential Eligible	Individual that may be eligible to the EMP Resettlement Program. Analysis must be completed.

Note on Data

In comparing data between tables, inconsistencies in numbers are due to the ever-evolving nature of the data (more fields belonging to M. Ngar... have been measured in another village; a “dependent” who, with further information, turns out to really belong to another HH). The overall messages delivered by the tables in this document remain the same, despite slight increases or decreases. The tables have been calculated at given points in time whereas the data continues to evolve.

EXECUTIVE SUMMARY

The purpose of the Land Use Mitigation Action Plan (LUMAP) Annual Individual Report is to provide information on the number of people currently at risk because of Esso Exploration & Production Chad Inc (EEPCI) Oil Project (Project) land take impacts. It also follows the results of livelihood restoration activities completed, initiated or ongoing in the past year. The percent of individuals/households whose situations have been resolved or improved by the Project over the past year provides a measure of the efficacy of both the LUMAP tools and the livelihood restoration activities.

LUMAP 2009 Livelihood Restoration Highlights

The major accomplishment in 2009 was the recognition, thanks to sufficient data collection and analysis, that the social units at risk because of Project land acquisition are individuals and households rather than entire villages. This understanding allows the EMP socioeconomic group henceforth to identify correctly and specifically those who are impacted and to focus its actions where impact is most felt.

A second major accomplishment for LUMAP was to have completed data gathering and to have identified people who are in fact Non-Viable but were not recognized as such at the time of earlier land acquisition. These individuals have either a) already been offered a resettlement option and been included in the Class of 2008-9 or b) will soon be offered resettlement benefits as part of the Class of 2010-11.

At the end of 2009 LUMAP has caught up with problems created because of earlier land acquisition and slow restoration. The next task, the goal for 2010, is to embed these tools and techniques within the EMP socioeconomic process so that they become ongoing, sustainable activities and part of "business as usual".

Data in this 2009 report on livelihood restoration provides information not only on people at risk but others who were mistakenly identified as vulnerable. The monitoring of their advances is a demonstration of positive development impacts the Project may have had. Failures are failures in investment in training but the individual was never at risk. These individuals will not be tracked in the future. (If one of them is put at risk by future land acquisition of course the individual's situation will be monitored). Viable people still in the midst of implementing their option will continue on to finish them out but they too will not be subsequently monitored for the prescribed 2 year period. This liberates EMP

socioeconomic resources to focus on helping non-viable households regain their livelihoods.

A résumé of LUMAP livelihood restoration activities in 2009 in the nine areas targeted for action:

1. Data acquisition and analysis

- Land use and Household Status surveys completed in 6 geographic villages, comprising 13 administrative units.
- “Red Flag” or seemingly at risk individuals and their HH were also surveyed in 13 additional villages about their land use and HH status.
- Results (data as of 16 Feb 2010):
 - Total population of 9 villages 100% surveyed = 8634
 - Total number of HH surveyed in 100% villages = 1589
 - Among Red Flags 118 HH were surveyed
- The villages completely surveyed in 2009 were: Madjo Bero and Mouarom; Begada 1 & 2; Bela 1 & 2; Mbanga 1 & 2; Bero 1, 2, 3, 4 and Quartier Mududoigne.
- Completed village survey data analysis for all but Bero. Bero and the Red Flag HH will be analyzed in 1Q 2010.
- *The numerically precise data from the Village Surveys showed that the impact of land acquisition on villages and households (HH) was less than earlier, less reliable data had implied.*
- 4 villages¹ have given up enough land permanently or are still waiting for temporary land to be returned to qualify them as highly impacted by LUMAP criteria. 6 had been classified as such prior to the land surveys.
- 10% of surveyed HH² possess insufficient agricultural land for normal subsistence; this contrasts with earlier estimates based on declarative data of 67% of all HH as non-viable.
- Developed and commenced implementation of 8 Site Specific Plans (SSP) for the villages of:
 1. Begada
 2. Bela
 3. Danmadja
 4. Dildo

¹ Excludes Bero, for which precise land data not yet calculated

² Excludes Bero since HH data has not yet been analyzed

5. Madjo
6. Mbang
7. Mouarom
8. Ngalaba

- Since Village Surveys show that most impacts of Project land acquisition occurred at the HH level, LUMAP included in the various 2009 SSP:
 - Plans for land return to the village
 - Supplemental community compensation activities to offset Project impact on communal resources
 - Resettlement options for HH identified as non-viable and affected by the Project

2. Livelihood restoration

- Carried out livelihood restoration reinforcement training for 211 graduates trained in earlier years who showed promise but needed some extra help in restoring livelihood
- Success rate of reinforcement training : 88%

This number of individuals, whether or not truly Non-Viable, succeeded in restoring their livelihood or greatly improving it.

3. LUMAP 2009 Learnings

- The primary impact of Project land acquisition has been on individuals and households, not on entire villages.
- The impact of land acquisition on individuals and households has been much less than earlier Compensation Database reviews suggested.
- Statistics derived from completed village surveys indicate that the number below the threshold for agricultural viability holds steady among villages and that land holdings among households are highly skewed.
- The average of HH in the surveyed villages fell into the categories:
 - 10% under the agricultural viability threshold
 - 10% marginal farmers
 - 35% small farmers
 - 45% large family farms
 - 1% of vast land holders (often elderly people holding family land in trust)
- Among compensated HH in the surveyed villages the average was:
 - 9% under the agricultural viability threshold
 - 8% marginal farmers

- 35% small farmers
- 50% large family farms
- 1% of vast land holders

4. Environmental Compliance

- World Bank Group's External Compliance Monitoring Group (ECMG) reassessed the LUMAP team's tools, approach, and results in May and December 2009 and found that the plan and execution continued to be sound
- LUMAP assisted the independent external environmental group ENVIRON in completing the field component of a Focused Environmental and Social Impact Assessment of the In Fill Drilling Program, which should appear in early 2010

The 2010 Go Forward Plan for LUMAP-EMP is to continue to identify people whom land acquisition puts at risk by using the LUMAP tools, to ensure Non-Viable people get resettlement benefits, and to monitor for 2 years all those at risk people receiving benefits to ensure they achieve livelihood restoration.

LUMAP 2009 Overall Highlights

In 2009, the LUMAP team carried out a number of activities directed at villages and at individuals directly affected by Project land acquisition. LUMAP activities continued to address the 9 Action Areas outlined in the Land Use Mitigation Action Plan:

1. Identification and Assessment of Impacts
2. Land Use Impact Reduction
3. Resettlement
4. Off-Farm Training
5. Improved Agriculture Training
6. Individual Compensation
7. Community Compensation
8. Consultation and Communication
9. Monitoring and Organization

By the end of 2009 LUMAP had completed all these action areas, with the exception of one site specific plan that still required data analysis: Bero

For these Action Areas, in the course of 2009, the LUMAP team completed the following:

1. Identification and Assessment of Impacts

- Finalized the land surveys of all village land (and land uses) and all households and household members in 10 villages that were on the LUMAP Watch List.
- For 2009 this meant the remaining 6 Village Surveys and data analysis for 5 of them
- Analysis shows that negative impact of land use is felt more keenly at the household (HH) level than by the entire village. No “village” can be said to be “at risk”.
- In the 9 villages the percent of households at risk (NV or M) is 297/1589 or about 20%
 - The agriculturally Non-Viable HH are 153 or 10% of the 1589 HH
 - 94 HH or 6% affected by Project land acquisition
 - The agriculturally Marginal HH are 144 or 9%
 - 87 or 6% affected by Project land acquisition
- Villages targeted for continued In Fill drilling are no different from other villages; the number of HH likely to be negatively impacted in future In Fill villages is minimal.

2. Land Use Impact Reduction

- Restored and returned 144 ha of land
- Developed and began implementation of Site Specific Plans in 8 villages.
- Despite continuing land acquisition for In Fill drilling, LUMAP and the rest of EMP, with the invaluable assistance of EEPCI Construction and local businesses, kept the Project footprint the same size. Land return offset land acquisition.
- Began trials of sustainable improvements in quality of land reclamation using green manure and compost generated from Project waste.
- Carried out regional campaign to “green up” the countryside with extensive tree planting in the Oil Field Development Area.

3. Resettlement

- As village surveys continued, some people were identified as being at risk although they had not been identified as vulnerable at the time their land was taken. They have been integrated into ongoing resettlement activities.
- First attempts at 3rd Party Compensation to provide at risk HH with land showed that caution is required. Some of the individuals proposing themselves as donors were themselves at risk; in other cases, some fallow areas proposed by donors would bring them massive compensation but not necessarily be of agricultural benefit to the recipients. The program was halted until safeguards are developed.

- The potential of another land program which would avoid pitfalls of 3rd Party Compensation was evaluated. Improving state-owned lands along watercourses so that land-poor farmers can cultivate high-value rice using their traditional rice farming methods was approved by the government ministries involved, by EEPCI and by Africa Rice, the leading African research institution.
- Actual resettlement: the “class of 2008³”. The class of 2008 was the first to be confronted with the requirement to pass Basic Business Skills, Literacy and Numeracy training as a condition for Improved Agriculture or Off Farm training. A great number of them, fearing that they would be unable to meet the requirement, chose to acquire sufficient land through 3rd party land compensation. The complications of acquiring 3rd party land proved so time consuming that as a temporary solution they were offered both BBS and Improved Agriculture training in the upcoming rainy season, but without the equipment grant. Encouraged by their success in BBS and the farming techniques they were learning, many chose to switch from land to Improved Agriculture in order to gain the equipment they had desired but thought they could never attain. By 1Q 2010 when the equipment was being distributed, 135 had asked to change over to improved farming. Only 8 still wanted land; 17 had no other alternative than land as they had failed at their earlier livelihood restoration attempts and 2 were planning physical resettlement.

4. Off-Farm Training

- Training in revenue-earning non-farm skills was not offered in the OFDA in 2009. (A LUMAP survey in 2007 showed the market was saturated).
- Instead, already-trained individuals who had over time shown interest and ability in their craft received reinforcement training. Through reinforcement craftsmen worked at perfecting tasks that needed strengthening and acquired specialized skills (plus equipment) that would give them special niches in the market. The training organizations went to the villages to instruct, so that the craftsmen would be learning in normal conditions.

5. Improved Agriculture Training

- In the same manner, reinforcement training was implemented for enterprising graduates of Improved Agriculture. A few were reinforced by agricultural equipment and equipment maintenance training but most received advanced training in their chosen off-season income-earning farm activity.

³ The eligible people choosing options are referred to as a “class” because so many of them choose training as an option that they all start their training at the beginning of the school year and they graduate together as well.

6. Individual Compensation

- EMP continued to use the comprehensive 2008 compensation valuation study since regular inflation monitoring indicated no changes in value.

7. Community Compensation

- A local NGO carried out 12 months of MARP (Rapid Rural Appraisal) consultation in the 15 OFDA villages where LUMAP would offset long-term land take by supplemental community compensation.
- 8/15 villages have received their chosen Supplemental Community Compensation as of year-end 2009. Work is underway or will begin in 1Q 2010 in the remaining villages that have made their compensation selection.

8. Consultation and Communication

- In each village, preceding the Village Survey, the survey team carried out public consultation on the purpose and the procedures for the survey.
- MARP consultation helped villages understand their basic needs and ability to sustain a project; in addition the NGOs carrying out the MARP gained an overall view of the area similar to a “regional development plan”.
- Discussion with the villages led to a streamlined “Quitus” process that returned reclaimed land to the farmers much faster.
- Communication with implementing NGOs allowed EMP and the NGOs to derive important lessons learned on project implementation.

9. Monitoring and Organization

- EMP-Information System (EMP-IS) database was improved to the level that it integrates all the Village Survey and HH data, responds to queries, and has been made available on the internal web.

2009 LUMAP ACTIVITIES

Any discussion of LUMAP findings must be prefaced by an explanation of the Village Survey method and its capabilities.

1. Village Survey Capabilities

By the end of 2009, LUMAP surveys had found everyone in surveyed villages that was non-viable, both those affected by Project land acquisition and those who remained untouched. The Village Survey tool has a number of advantages.

1.1. Brief Summary of Village Surveys

In 2007, the LUMAP team developed and put in place a data collection methodology and means of analysis permitting the quantitative identification of At-Risk households. The EMP-Information System database developed by the LUMAP team utilizes the Microsoft Sequel Server relational database and is able to import Geographical Information System (GIS) data from the sophisticated Global Positioning System (GPS) handheld devices used to measure a farmer's fields and the detailed Socioeconomic Survey instrument. These devices are also handheld computers utilizing the ArcGIS software to synthesize.

By the end of 2009 LUMAP had completely surveyed all the HH and individuals in the 10 villages that had been judged to be at risk in 2006 and had also linked all the land within the surveyed villages' boundaries to the land users. How each piece of land was currently being used was also surveyed. The Village Surveys yield a clear view at a given moment in time of:

- Village population size, age, sex and employment
- Number of HH and their composition
- Land holdings of HH and HHM
- Land use map of village lands

Many other specific questions concerning Project impacts on the HH were also included in the survey.

1.2. Detecting Non-Viable HH by Village Surveys

In its Chad Resettlement and Compensation Plan (CRCP, vol. 3 of EEPCL's Environmental Management Plan) agricultural "Non-Viability" is defined as "access to less than 2/3 corde⁴ of land (both cultivated and fallow), for each person [declared] as a member of [the] household."

This figure was derived from the Project's baseline study of 468 HH plus CIRAD (now ITRAD) research institute studies on land use and fallow. The 2006 World Bank study of poverty in Chad derived similar numbers for all of southern Chad.

The Project refers to the calculation of Non-Viability as "resettlement factor" or the point at which a HH falls below 2/3 corde per person in the HH.

$$\text{Non Viability} = \frac{\text{Land Holdings}}{\# \text{HHM}} = \text{Resettlement Factor}$$

Using Village Survey data on precisely measured fields and fallow plus the true number of HH members reveals which HH do not have enough land to be agriculturally viable.

Of course this viability/Non-Viability refers only to the time at which the survey was done; what if measles suddenly killed off most of the children in the HH, or the HH head's sister leaves her husband and moves in with her 6 children. Such events occur and rapidly change the HH's size and its demands on land holdings. For this reason the system for tracking HH viability put in place by LUMAP requires that the survey be updated each time the Project compensates the HH for additional land.

Once a Village Survey has been completed, it is easy to calculate the current resettlement factor for each HH. Looking through the list of resettlement factors of HH that have been affected by Project land acquisition shows precisely the HH that are non-viable and eligible for Project assistance. Additional data indicates whether or not the non-viable HH has been offered a choice of resettlement options and how well those options have done at restoring livelihood. At the end of 2009, how many Project-affected HH in the 9 villages remain Non-Viable or Marginal and vulnerable and without a resettlement option? (26)

The Village Surveys show the extent of HH Non-Viability in a village and the order of magnitude of the poor livelihood problem. Looking across the board at the HH that fall into the categories "Non-Viable" and "Marginal" in the surveyed villages, it becomes evident that certain types of HH tend to fall into these two categories. Thus the village surveys orient

⁴ Corde = traditional land measure equaling about ½ hectare (5040 m²)

LUMAP to seek out these types of HH when any future land acquisition is proposed, so that Project-caused negative impact can be immediately addressed.

1.3. Assessing Village Viability by Village Surveys

The initial assumption leading to LUMAP was that Project land acquisition and the slow rate of land reclamation and return had put all the inhabitants of highly affected villages at economic risk. The task was, via Site Specific Plans (SSP), to identify and implement actions that would restore the village to viability. Defining these actions would be accomplished by consultation, analysis of existing data, and analysis of a Village Land Survey pilot that would be tried in Dokaidilti.

The Dokaidilti survey demonstrated in a measurable way that the degree of negative impact in the heavily impacted village was much smaller than prior analysis of declarative data had indicated. Because it was able to pinpoint at risk households the Village Survey methodology became the basis for future SSP, although land reclamation and return remained a very high priority in reinstating villages.

Village land surveys have the advantage of indicating the current division of village land between fields, fallow, and bush. It is easy to calculate what percent of the village's land (fallow and bush) remains for potential future exploitation and the population density per km². Using a formula including population size, length of cultivation cycles, etc. gives an approximation of the carrying capacity of the land (how many people can successfully live on a given area using their current farming techniques). A permutation of the formula gives the number of years an average farmer in the village can leave a piece of land in fallow to regain its fertility. Will it be long enough for fertility to be restored in the 9 villages? (Yes).

The farming techniques in the OFDA are known (years in crops, desired years in fallow); comparing these needs to the potential length of fallow indicates to what degree the village is agriculturally viable. The same is true for the potential number of people that could be carried by the land. Is the number greater or smaller than the current population? (Greater).

Another way of looking at Village Viability was initially employed by LUMAP using the kind of data that was available in 2007. When these results are compared to the precise population/agronomic results of the Land Surveys it is clear that the earlier criteria were more an evaluation of Project performance in land reclamation than a measure of direct Project impact on the community land pool. This earlier calculation concerned:

Amount of village land taken but not returned

Total village land area

According to these criteria the amount of village land taken falls into two categories:

- I. Land taken with the intention of using it for the lifetime of the project (e.g. camps, roads)
- II. Land taken temporarily (underground flow lines, ½ of each well pad) but not yet returned

Category 1 should have been the measure of Project impact (how much of its land has a village lost for the estimated 23-30 year lifetime of the project?). But poor Project performance in land reclamation and return resulted in a good portion of the acquired temporary land remaining un-reclaimed and effectively out of cultivation for up to 5 years. For a correct view of Project impact the un-reclaimed temporary land is included as a sub-set of permanent land. As part of LUMAP, this earlier lag in temporary land return has been offset by LUMAP's Supplemental Community Compensation.

Using these initial 2007 categories of land take, out of 24 villages 5, then 7 were eventually classified as Highly Impacted and 3 as "Approaching High". Since then the Project has developed and is implementing Site Specific Plans intended to reduce the backlog of unclaimed land for both categories I⁵ and II types of land. This not only fulfills Project obligations but helps individuals and families whose land should already have been returned to them and the community. But the Village Survey method shows that it is not the village as a whole that needs to benefit from the return. (Villages are not at risk).

1.4. Judging the Power of Traditional Ways to Adjust Population to Land

Earlier published ethnographic studies of the area have uncovered the ways in which the population of the area has traditionally dealt with land pressure and related social tensions. Are the coping mechanisms studied in the 1970s still in force today, and are they powerful enough to deal with the additional pressure on land created by Project land take? The reliability of population data available to answer this question varies, but enough information is available from pre-Project times (the National Census in 1993, for example) to judge whether traditional coping mechanisms were still at work just before the Project began. (They were).

⁵ Not all permanent construction was in fact carried out. If well performance indicated that a certain area would not produce much oil, nearby well pads, access roads, etc. could be reclaimed and returned.

Population data collected by village and canton chiefs for their administrative tasks are also available for the period during which the Project has been implemented: 2000-2009. Starting in September of 2007, precise population data from the Village Surveys has also become available and can be analyzed. Have the same traditional coping mechanisms been expressed during the Project period or have they been overwhelmed? (They are still at work).

If traditional methods are still active, then their power is conjoined with specific Project interventions – resettlement options and land return in particular – to restore, maintain or augment HH viability. This depends in part on how well HH receiving resettlement options have used the option but they always have recourse to the traditional ways of restoring their livelihood or do better than before. (On the whole, HH do pretty well with resettlement options).

2. Village Survey Results

2.1. Overall Picture of Surveyed Villages

Critical facts about each village are its population (how many people are in the specific Project-affected area?); number of households (number of social units being affected?); population density (what is the intensity of social interaction/tension?); and average length of possible fallow (What is the pressure on productive resources, demand for farmland and sustainability of current farming system?). What differences are there within villages in terms of status, family size, and households (do all people share equally in Project impact? Are there vulnerable people?)? Given that traditional means of coping with social pressures and land shortage are still in play, do the people that resort to these traditional measures put themselves temporarily at an economic disadvantage that Project actions could aggravate?

Answering questions with hard data:

Population Figures and Productive Resources

Village	Population	# HH	People/Ha	Length of Fallow
Danmadja	570	101	1.19	6.02
Dokaidilti	533	85	0.78	10.32
Dildo	1 326	268	0.70	12.93
Ngalaba	1 318	249	0.62	15.12
Mbanga	1 497	269	0.49	26.46
Madjo Bero	839	131	0.39	26.67
Begada	1 287	259	0.39	26.70

Bela	830	144	0.38	27.53
Mouarom	444	84	0.33	32.23
Bero	3 897	311	na	na

Initial comparison of the village populations and the number of HHs gives the impression that villages are very different from one another. But looking at population density and length of fallow reduces the impression of differences by comparing villages' use of village resources.

To answer the questions:

- People in the 9 villages 8 634
- Number of social units in area 1 589
- Intensity of social interaction

Low	5 villages (density 0.33-0.49)
Medium	3 villages (density 0.62-0.78)
High	1 village (density 1.19)
- Possible length of fallow

More than adequate	5 @ 20+ years
Adequate	3 @ 10+ years
Barely sufficient	1 @ 6 years

The village with “high density” and “barely sufficient” fallow will be examined in section 5 below.

The number of HH in the Project area is related to HH size: big HH mean a smaller number of HH in the village but more intense interaction within the HH. HH size is determined in part by biological factors (births, deaths) but in good part by social factors. The chief factors which operate in the OFDA are:

- Birth of children which drives establishment of an economically independent HH
- Divorce or widowhood (plus the intermediate stage in this culture of “separated”)
- Social obligations to care of people other than the nuclear family
- Old age

But another important factor driving HH size in many societies is:

- Access to productive resources

The last point is important to understand within the Project context and need for land. Are there social distinctions that limit access to productive resources? Has the Project's land acquisition reduced HHs productive resources and increased HH size and HHM interaction, which could lead to more conflict?

As said, most of the factors listed above appear to be driven by biological events but they are also expressions of the culture's way of viewing and treating the different stages of life. For

example, in some societies a couple would become an economically independent entity directly upon marriage; here males become residentially independent in their bachelor teens and begin the steps towards economic independence. Here the act of marriage may or may not lead the couple to establish a separate HH but then, with children coming along, the couple becomes economically independent. At a later stage the wife may become economically independent, either staying in the same homestead or moving elsewhere. The nature of the domestic cycle in the OFDA plays an important role governing access to resources i.e. the need for resources finds a general cultural, not simply biological, expression. But this expression does not operate at the village level, as the table below shows. There is no relation – at the village level – between access to productive resources and HH size. Project pressure on assets does not affect “villages” and create more intense, and possibly negative, social action among the village households. Villages as a social unit are not at risk. Nor does Project pressure drive HH to increase in size and interaction because more people must exploit the unvarying HH productive assets.

Village	People/Ha	Avg. HH Size
Danmadja	1.19	5.6
Dokaidilti	0.78	6.3
Dildo	0.70	4.9
Ngalaba	0.62	5.3
Mbanga	0.49	5.6
Madjo Bero	0.39	6.4
Begada	0.39	5.0
Bela	0.38	5.8
Mouarom	0.33	5.3

2.2. Traditional Coping Mechanisms in Surveyed Villages

Are the HH in villages that have resorted to traditional coping mechanisms at higher risk because they have abandoned the assets they had been exploiting? (No).

2.2.1. Village Splits

The most common traditional coping mechanism at the village level is for the village to split. Initially when a HH does not get along with its neighbors it seeks separation and moves to the far end of the village or out of it. Or when the village is large enough for people to start building factions and gain supporters, an individual with aspirations to influence will hive off and settle on a distant part of village land or in another area entirely, where the HH is more autonomous. Sometimes partisan HH that have followed their leader find that the seeming

opponent's pasture was indeed greener, or the querulous HH fails to increase. In these cases hamlets die out. But often the hamlet becomes the nucleus of a new village exploiting the area on which it has settled. Eventually the new village will ask for administrative recognition of its separate status as a new village. Of the 10 surveyed villages 5 have completed a split during the time the Project has been running and 4 are in the process of splitting. They are not alone among the OFDA villages.

A comparison of HH numbers, population size and access to productive resources shows that split villages are identical twins. There are no characteristics that would put one part of the village at a disadvantage vis à vis Project impact. In fact, in terms of differences in land distribution among HH, all villages demonstrate similar proportions of wealthy, comfortable, Marginal and vulnerable HH.

Comparison of Population and Land Availability Between Former Quartiers of Split Villages

	Begada 1	Begada 2	Bela 1	Bela 2	Diido	Bayande	Dokaidilti	Banelaou	Danmadja 1	Danmadja 2	Ngalaba 1	Ngalaba 2	Wolo
population quartier	669	624	474	374	638	716	398	138	369	210	512	694	118
% population quartier/total population	52%	49%	45%	45%	47%	53%	75%	26%	65%	37%	39%	53%	9%
population density people/corde	0.22	0.23	0.25	0.27	0.49	0.39	na	na	1.75	2.07	0.48	0.37	0.55
population density cordes/person	4.49	3.87	4.06	3.65	2.03	2.55	na	na	0.01	0.00	2.09	2.71	1.83
# HH in quartier	151	109	79	65	127	148	59	26	61	41	102	129	19
% Quartier HH/ All HH	58%	42%	55%	45%	47%	54%	69%	31%	60%	40%	41%	52%	8%
Avg. corde/HH in quartier now	20	22	4	7	10	12	11	12	11	11	10	15	11
Avg corde/capita in quartier now	6	6	24	21	2	3	2	3	2	2	2	3	2

Comparison of Land Distribution Between Former Quarters of Split Villages

Per Capita Land Holding	Begada 1	Begada 2	Bela 1	Bela 2	Dildo	Bayande
Number Zero land	0	1	6	6	3	2
Number Non Viable (<2/3 cde)	4	10	37	37	18	14
Number Marginal (2/3 - <1 cde)	4	7	0	0	21	18
Number Comfortable (1 – 2/5 cde)	35	22	5	7	49	62
Number Wealthy (2.5-10 cde)	95	53	4	3	31	45
Number Wealthy (10-20 cde)	8	9	19	13	5	5
Number Wealthy (20-30 cde)	3	4	46	35	1	1
Number Wealthy (30-40 cde)	1	1	5	0	0	0
Number Wealthy (40 + cde)	1	1	0	0	0	0

2.2.2. Non-Agricultural Productive Resources

Fishing is another coping mechanism available to some villages only. Not all families in fishing villages engage in the practice and some use their catch just to feed the family whereas others go fishing for the extra income it brings. Presented with a substantial fish sauce the family needs less staple cereal to be satisfied and well nourished so a fisherman's family does not need to grow as much. The extra income from fishing is available throughout the months that cereal is cheaply available in the market and the adults can round out the family's staple needs; most fishermen earn between 20-30000 f CFA per month during the 6 months when fishing is good. Many families in fishing villages do not need as much land as inland farmers to maintain an adequate standard of living. Fishing diminishes the need for land as a productive resource.

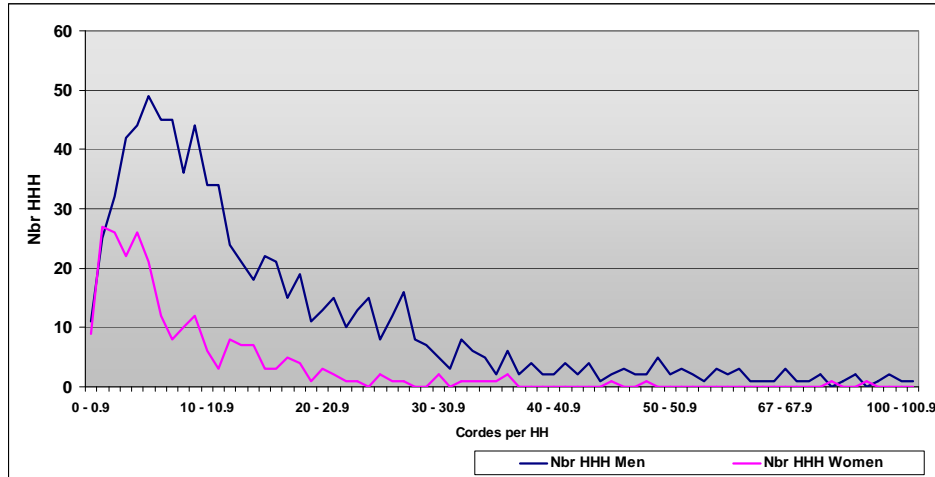
Fishing Villages	People/Ha	Years Fallow
Danmadja	1.19	6
Dildo	0.71	12
Dokaidilti	0.78	10
Madjo	0.39	26
Inland Villages	People/Ha	Years Fallow
Begada	0.36	26
Mbanga	0.49	26
Mouarom	0.33	32
Bela	0.38	27
Ngalaba	0.63	15

Although Madjo Bero and Bela are fishing villages they are anomalies. Madjo Bero has more than ample land because during the Project period it has undergone a definitive split, with part of the village moving across the river into another Canton/Sub-Prefecture. They now farm in Madjo Doba. Bela's situation is ambiguous; while it has plenty of land there are some inhabitants who are serious fishermen. But accessing the river from Bela is more difficult and recreational fishing for the family table is less common.

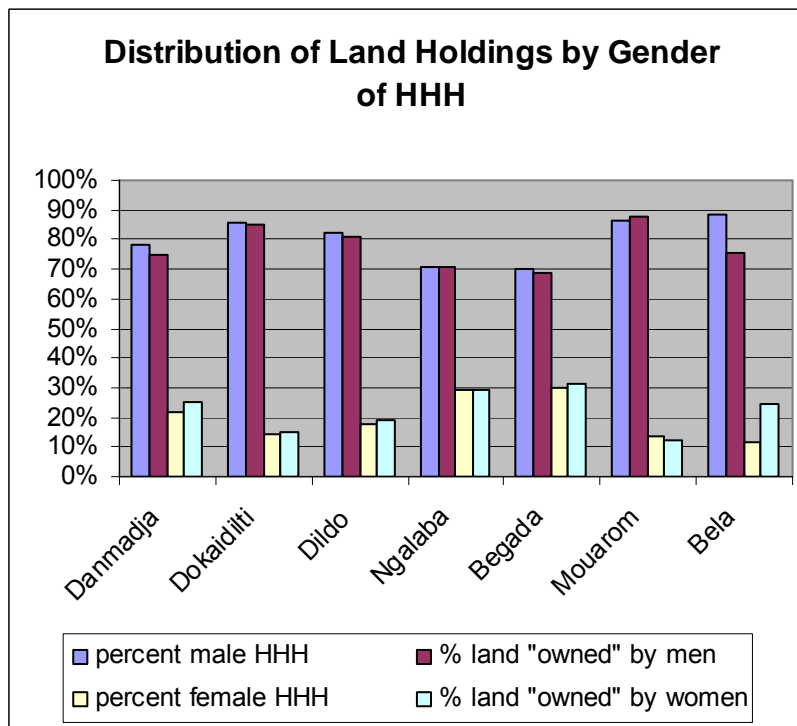
2.3. Gender in Surveyed Villages

Cultural attributes such as economically independent women with their own productive resources can be observed at the village level. In this culture, women are allowed economic independence and inherit family land along with their brothers, as the following data show.

Range of Land Holdings by Gender (Begada, Danmadja, Dildo, Dokaidilti, Mouarom, Ngalaba)



The village surveys show the extent to which women become the heads of their own HH and no longer have the protection of a husband and the husband's household resources.



As women can be self-reliant because of their right to productive assets, so Project actions which act on productive resources can also directly affect women.

Village	#HH	# Males	# Females	MHHH	FHHH	% FHHH / All HHH
Dokaidilti	85	243	290	75	10	12%
Bela	144	428	402	126	18	13%
Danmadja	101	284	286	87	14	14%
Mouarom	84	213	231	72	12	14%
Madjo Bero	131	412	427	112	19	15%
Dildo	268	649	677	213	55	21%
Mbanga	269	717	780	205	64	24%
Bero	311	1924	1945	527	84	27%
Begada	259	608	679	187	72	28%
Ngalaba	249	664	654	173	76	31%

When 20-30% of village households are headed by women, a significant part of the women in the village are open to un-mediated direct impacts on their assets.

2.4. Age Distribution in Surveyed Villages

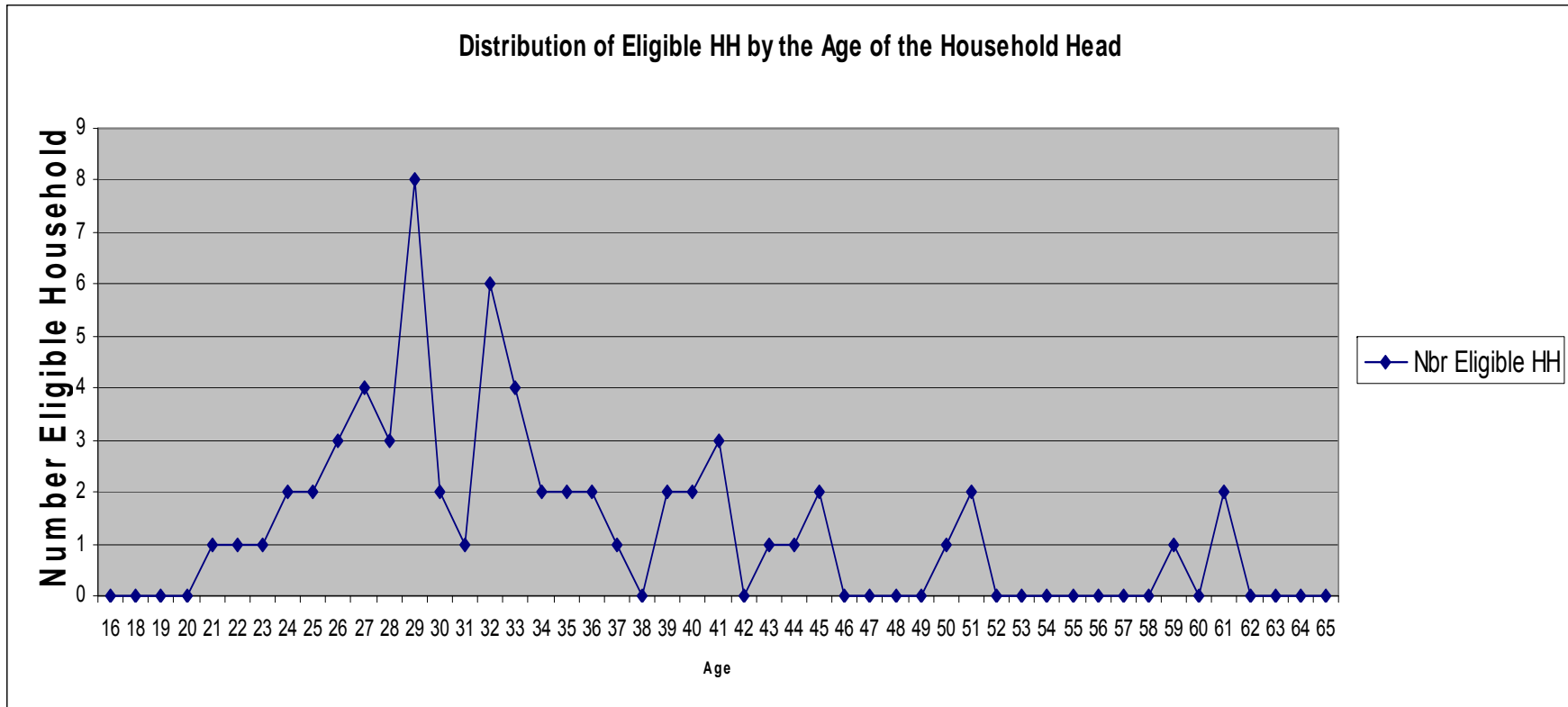
In all the surveyed villages the average age of the population is young. This means that there are many non-productive inhabitants in the village who must be sustained by the adults in charge. Project actions affecting a few adults can result in affecting indirectly quite a few people.

Village	Avg Age All Males	Avg Age Females	Avg Age Population
Begada	18.5	20.5	19.5
Bela	18.3	20.1	19.2
Bero	17.3	18.8	18.1
Danmadja	19.8	19.5	19.6
Dildo	19.8	22.2	21.1
Dokaidilti	19.8	21.0	20.4
Madjo Bero	16.6	19.4	18.0
Mbanga	17.4	21.2	19.3
Mouarom	19.8	20.4	20.1
Ngalaba	18.9	22.2	20.5

Not only is the average age young; the preponderance of household heads (HHH) in all surveyed villages is also young and this group of HHH will bear the brunt of Project impacts on productive resources simply because demographically they are the most

numerous group in the population. Demographics also play a role since more women live to an older age and, as has been shown, they are often independent and have their own assets.

Peak Ages for Vulnerability



2.5. Gender As a Mediating Factor

When the Project definition of agricultural Non-Viability resulting from Project land take -- a definition used to decide if a person is eligible to choose a resettlement option -- is applied, the cultural influence on how households are formed leads to a seeming large number of Non-Viable young male HHH. Gender thus appears to be a mediating factor, making young men particularly vulnerable.

Comparison of Vulnerability by Age in Dildo, Dokaidilti, Ngalaba and Danmadja Villages		
Age	% Male HHH Non-Viable	% Female HHH Non-Viable
>20	0	0
20-29	19	0
30-39	8	3
40-49	5	3
50-59	3	4
60-69	1	5
70-79	0	0
80+	0	0

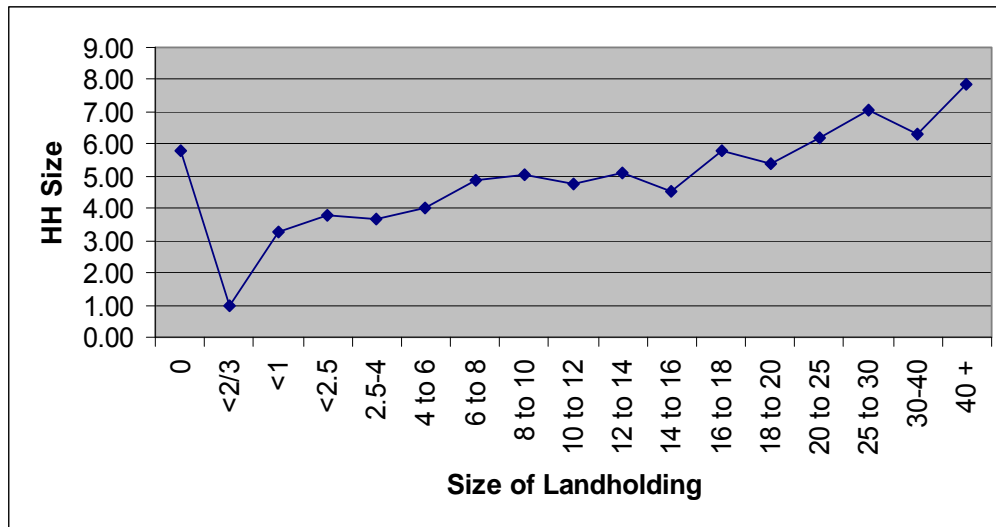
But looking at available land the village level shows that the villages have plenty of land. Social analysis also shows that many seemingly vulnerable young HH only appear that way. A young male HHH looks as though he has only a few fields for his HH members because his HH has only started farming and has not yet reached the point where a piece of land has been farmed long enough for it to need to be fallowed. As soon as the young male farmer needs more land because of declining fertility he will ask the old man for access to some of the family trust fund. Only the unlucky HH that are just starting out in life without any trust fund of land to draw on are, in fact, non-viable and will probably remain so unless traditional mechanisms are called into play.

The unlucky male HHH without a family trust tend to be children of men who have moved in to the village from the outside. If they have moved to join their mother then they have access to her family's land, but their residual rights do not have precedence over a large number of maternal cousins. A man's decision to move to another village (which occurs

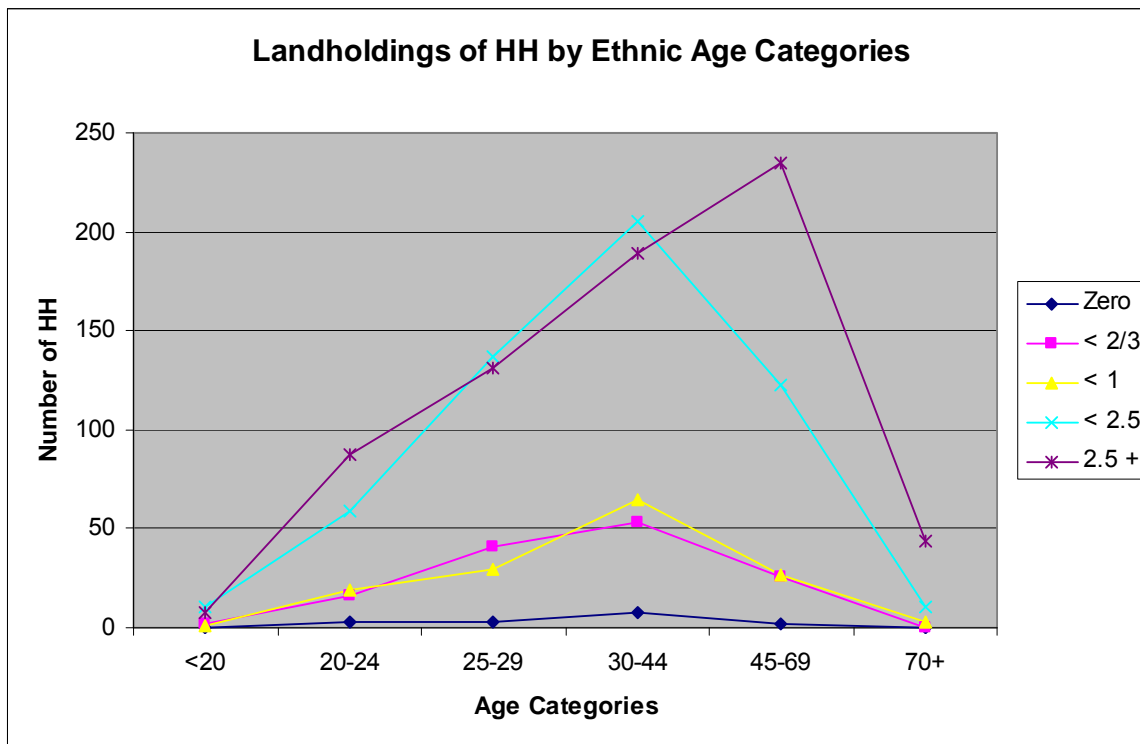
for many reasons) has for his heirs the consequences of limiting the family trust to the amount of land he is able to convince his host, or village chief, and land priest to give him.

For the majority of males, living in their natal, and their father's natal, and their father's natal village there is always the family trust to draw on. The balance between HH size and the amount of land belonging to the HH demonstrates this slow transfer from those in the HH according to their ability to give unto those relatives according to their increasing need for land. (See following graph). The few HH without any inheritance to call on (left hand side of graph) cannot attain this balance in their current residence.

Distribution of Land Among HH by Size (Begada, Danmadja, Mouarom)



Number of HH at Different Ages with the Amount of their Landholdings



By comparing HH at the village level this age phenomenon becomes evident. All village HH are not in trouble, lacking productive assets, only a few. (10%)

Age and gender are mediating factors in the development of vulnerable female-headed HH as well. Young women separate from their natal families when they marry/have children. At this point in the new HH’s domestic cycle, the husband should, according to the cultural norms, be primarily responsible for his wife and children (the wife being tied down at home by child care). The age distribution of female HHH shows this norm is largely respected. With time the marriage bond may change and the wife undertake more productive (rather than reproductive) activities to complement her husband’s support to herself and her children. It is the degree of “support” that is/should be given that is the most contentious issue in marriage, leading to numerous traditional court cases, separations and divorces.

The increasing independence of women as they grow older is clear in the village surveys. The fact that women become independent as they age means they must have productive resources of their own to support the independent family. As a consequence, any factor that affects these resources affects these women directly. Older female HHH with limited

productive resources tend to be non-viable or Marginal farmers. Most often they are women who have married outside their natal village where they would still be able to access family land.

Comparison of Vulnerability by Age in Dildo, Dokaidilti, Ngalaba and Danmadja Villages		
Age	% Male HHH Non-Viable	% Female HHH Non-Viable
>20	0	0
20-29	19	0
30-39	8	3
40-49	5	3
50-59	3	4
60-69	1	5
70-79	0	0
80+	0	0

It is the few HH characterized by these vulnerability factors tied to age and gender that are more open to feeling Project impact. Later examination of individual HHs will reveal the nature of HH vulnerability.

2.6. Status Differences in Surveyed Villages

The answer to the question whether there are differences in social status that prevent equal access to productive resources is “NO”, as these tables and charts indicate. It is the other way around; social status is measured by access to productive assets, with its links to age and gender and family trust funds. But, and herein lies the rub, it depends on how you use those assets that gains you social status. 30 cordes in the family trust fund gets you nothing, but put some of that into farmland and be generous with the harvest and your status rises. Status depends on your interest and ability in farming and on your relationship with other villagers.

Comparing HH at the village level shows that there are indeed differences within each village in terms of land holdings. There are a few landholders with such exceedingly large tracts of land that all the HHM could never succeed in cultivating even half; it is these land holders who have lands lying fallow for 30-40 years or more. They are the senior members of the

family holding the family land in trust but with too few successors that have demanded land and whittled down the land trust (low number of births, lack of interest in farming, an heir already farming to his maximum). Upon his or her death the heirs will receive packages of land that are likewise large and may lie unfarmed. (See graph “Number of HH at Different Ages with the Amount of their Landholdings” above).

And yes, elderly women can have extensive holdings:

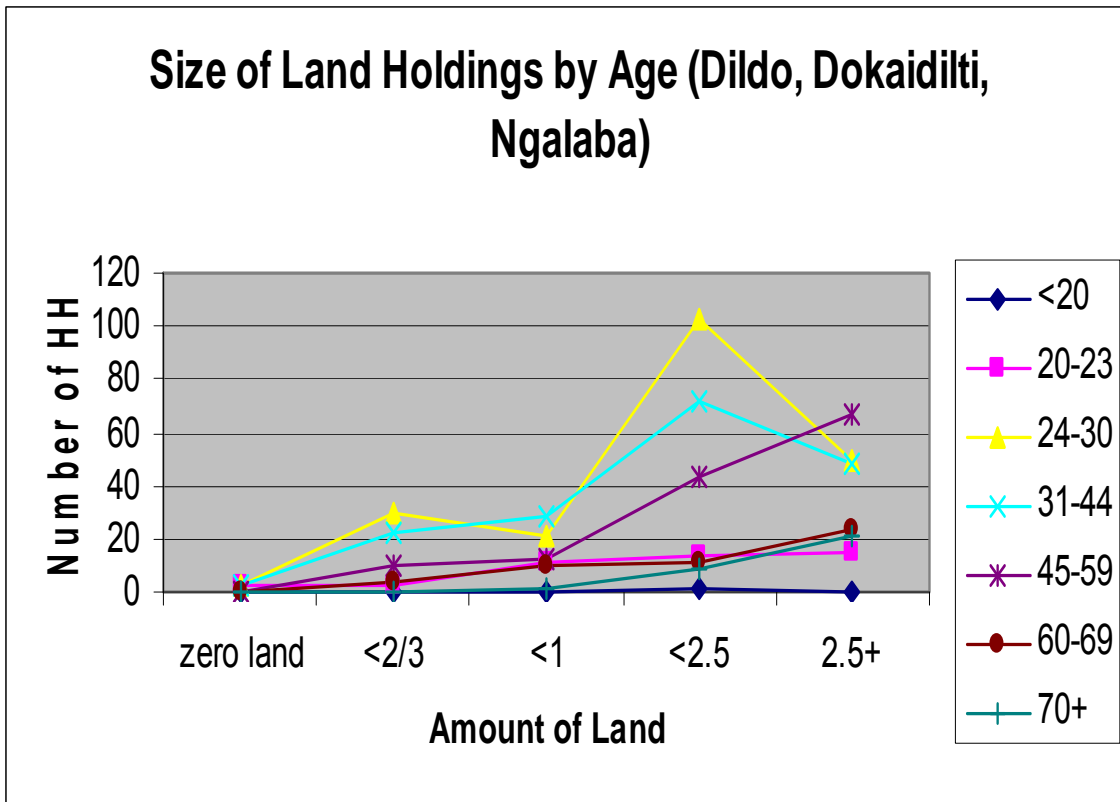
Age and Gender of Land Holders over 30 Cordes Per Capita				
Village	Male Land Holder	Ages	Female Land Holder	Age
Begada	2	48; 61	3	73; 71; 75
Bela	2	50; 63	0	
Danmadja	0		0	
Dildo	0		1	76
Dokaidilti	0		0	
Mbanga	0		1	65
Mouarom	0		0	
Ngalaba	0		1	59

Per capita land holdings as large as these are the exception but in the surveyed villages most HH are land wealthy, with large farms of more than 2.5 cordes per HHM, 10 to 20 cordes per HHM. Another large group is comfortable land holders, with 1 to 2.5 cordes per HHM. Fewer HH are Marginal or Non-Viable. The presence of HH with no land at all can be explained either by other sources of HH income, support of children, or because the person has borrowed/rented land from someone else.

2.7. Land Holding Differences Within Village

It is above all this skewed distribution of land, skewed in the same way in all the surveyed villages, which leads to the conclusion that villages as a whole are not at risk. Instead, specific HH lack access to productive land (see tables below and Annex B for more detailed tables).

What can be the causes of this disparity in access to resources? We have seen that age gender, and village of origin play a role but that social status differences do not. What about Project impacts?



2.7.1. Project Compensation and Land Acquisition as a Cause of Non-Viability or Marginality?

Differences in land holding status clearly exist in the surveyed villages and a similar distribution of land is found in each of them. But perhaps the Project’s land acquisition has affected all HH equally, whatever their prior status, and created similar numbers of Non-Viable and Marginal HH throughout the population. (It has not).

Per Capita Land Distribution (Cordes per Capita)

% ALL HH	Begada	Bela	Danmadja	Dildo	Dokaidilti	Madjo Bero	Mbanga	Mouarom	Ngalaba	Average
zero	0%	0%	1%	2%	0%	2%	0%	3%	1%	1%
<2/3	6%	8%	15%	11%	12%	12%	6%	5%	7%	9%
<1	5%	5%	21%	15%	15%	9%	6%	3%	8%	10%
<2.5	22%	22%	39%	40%	42%	43%	30%	36%	41%	35%
2.5 +	68%	65%	25%	32%	31%	34%	57%	53%	42%	45%

Distribution of Individual HH per Village by Per Capita Land Holdings

Village	All/Compensated	Zero	0 to <2/3	2/3 to <1	1 to <2.5	2.5 +
Begada	All	2	13	12	57	176
	Compensated	2	9	10	40	129
Bela	All	0	12	7	32	93
	Compensated	0	5	1	16	60
Danmadja	All	1	15	21	40	25
	Compensated	1	12	17	37	21
Dildo	All	5	31	40	111	88
	Compensated	1	10	16	45	31
Dokaidilti	All	0	10	13	36	26
	Compensated	0	9	12	31	21
Madjo Bero	All	3	16	12	57	45
	Compensated	2	10		51	39
Mbanga	All	0	17	16	82	153
	Compensated	0	10	13	63	125
Mouarom	All	3	4	3	31	46
	Compensated	2	4	3	26	39
Ngalaba	All	2	19	20	103	106
	Compensated	0	17	15	85	92
Total	All	16	137	144	549	758
	Compensated	8	86	87	394	557

**Village Impact Classification According to Number of HH
(not individuals) Land Holding Status**

Village	All HH & Compensated HH	% Non-Viable HH / All HH	% Non-Viable Compensated HH / Compensated HH
Begada	All	5.8%	
	Compensated	4.2%	5.8%
Bela	All	8.3%	
	Compensated	3.5%	6.1%
Danmadja	All	15.7%	
	Compensated	12.7%	14.8%
Dildo	All	13.1%	
	Compensated	4.0%	10.7%
Dokaidilti	All	11.8%	
	Compensated	10.6%	12.3%
Madjo Bero	All	14.3%	
	Compensated	9.0%	10.8%
Mbanga	All	6.3%	
	Compensated	3.7%	4.7%
Mouarom	All	8.0%	
	Compensated	6.9%	8.1%
Ngalaba	All	8.4%	
	Compensated	8.1%	8.1%
Total	All	9.5%	
	Compensated	8.2%	8.2%

High	15.10%
Approach High	10.10%
Moderate	5.10%
Low	0.00%

Examining this question is not straightforward because the declarative data given at land acquisition and recorded as “baseline” is unreliable. Using this declarative data to determine a HH’s pre-Project land holding status would yield little useful information on this earlier status. Instead the GIS-measured amount of land taken from the HH, from Project inception to date, has been added to the GIS-measured land belonging to the HH at the time of the village survey. Some HH may have gained or lost land during this time through the operation of cultural factors, so the initial situation was somewhat different, but the sum of the two land measurements is a certainty. For calculation purposes the number of HHM counted during the village survey has been used as the number of HHM prior to Project land acquisition. This is an assumption since HH grow and shrink as the domestic cycle turns, but it gives an objectively measured number and, for HH compensated late in the Project it is close to today’s situation.

Pre-Project land holding status for a HH has been calculated thus:

$$\frac{\Sigma \text{ Land measured by Project for compensation} + \text{ Land Holdings measured by Village Survey}}{\text{Number of HHM counted by Village Survey}}$$

This gives an approximate cordes per capita (or “resettlement factor”) measure just before the HH’s first land compensation.

The following tables compare the number of Non-Viable and Marginal HH, plus other HHs’ land holding status “pre-Project” and today.

# All Mbanga HH at Resettlement Factor					
HH viability factor	Total # current HH	Male HHH		Female HHH	
		203		63	
	269	before	now	before	now
Zero	0	0	0	0	0
<2/3	17	5	8	8	9
<1	16	8	12	5	4
<2.5	82	59	65	15	17
2.5 +	154	134	121	35	33

# All Madjo HH at Resettlement Factor					
HH viability factor	Total # current HH	Male HHH		Female HHH	
		before	now	before	now
	133				
zero	3	1	3	0	0
<2/3	16	11	13	3	3
<1	12	11	11	0	1
<2.5	57	46	52	6	5
2.5 +	45	50	41	5	4

# All Bela HH at Vulnerability Factor Per Capita				
HH viability factor	Male HHH		Female HHH	
	before	now	before	now
zero	0	0	0	0
<2/3	6	9	3	3
<1	8	6	1	1
<2.5	27	28	3	4
2.5 +	86	84	10	9

# All Mouarom HH at Factor Per Capita					
HH viability factor	Total # current HH	Male HHH		Female HHH	
		before	now	before	now
	87				
zero	3	0	2	1	1
<2/3	4	5	4	0	0
<1	3	0	2	0	1
<2.5	31	22	25	7	6
2.5 +	46	48	42	4	4

# All Danmadja HH at Factor Per Capita					
HH viability factor	Total # current HH	Male HHH		Female HHH	
		before	now	before	now
	102				
zero	1	0	0	0	1
<2/3	15	10	13	2	2
<1	21	7	16	2	5
<2.5	40	41	35	8	5
2.5 +	25	30	23	2	2

# All Begada HH at Factor Per Capita					
HH viability factor	Total # current HH	Male HHH		Female HHH	
		before	now	before	now
	259				
zero	0	0	0	0	0
<2/3	17	5	8	8	9
<1	16	8	12	5	4
<2.5	82	59	65	15	17
2.5 +	154	134	121	35	33

# All Dildo HH at Factor Per Capita					
HH viability factor	Total # current HH 272	Male HHH		Female HHH	
		before	now	before	now
zero	5	4	4	0	1
<2/3	31	16	20	11	11
<1	40	27	32	8	7
<2.5	111	101	95	16	16
2.5 +	88	69	65	23	23

# All Dokaidilti HH at Factor Per Capita					
HH viability factor	Total # current HH 85	Male HHH		Female HHH	
		before	now	before	now
zero	0	0	0	0	0
<2/3	10	4	7	3	3
<1	13	6	11	2	2
<2.5	36	41	31	2	2
2.5 +	26	24	23	3	3

# All Ngalaba HH at Factor Per Capita					
HH viability factor	Total # current HH 250	Male HHH		Female HHH	
		before	now	before	now
zero	2	0	0	2	2
<2/3	19	8	12	6	7
<1	20	13	14	4	6
<2.5	103	63	73	21	30
2.5 +	106	90	74	36	32

Project land acquisition could not be the only source of Non-Viability or Marginal status because HH already found themselves in these categories before Project activities began. In spite of Project land acquisition the great majority of HH today are either large or comfortably well off land holders.

2.7.2. Project Compensation and Land Acquisition and the Creation of Resource Haves and Have-Nots?

Comparison of those who have received Project compensation because of Project land acquisition shows not only that the percentage of the population that has received compensation is similar in most of the surveyed villages but also that a majority of HH in a village have received compensation. The number of HH in one village having received compensation is essentially the same as in the others.

Village	% of HH receiving compensation	% HH unaffected directly and no compensation
Begada	73	27
Bela	53	47
Danmadja	87	14
Dildo	37	63
Dokaidilti	86	14
Madjo Bero	83	17
Mbanga	78	22
Mouarom	85	15
Ngalaba	84	16

In 7 of the villages – not Bela and Dildo – almost $\frac{3}{4}$ of the households have received compensation at one time or another, some HH several times, during the Project. In 4 surveyed villages more than 80% have received compensation⁶. By contrast, Bela and Dildo, whose village lands lie only partially over the oil-bearing fields, have received less compensation since there was little connection with Project land needs. Do these villages less affected by the project have fewer at risk people, demonstrating that where the Project impact is less the HH situation is better? The answer is a clear “NO”; compensation does not automatically lead to an increase in Non-Viability. Many other factors must enter as well or else how to explain how the least compensated village has more Non-Viable and Marginal HH than the average village in the survey?

Non-Viable and Marginal HH in Less Compensated Villages

Village	% Non-Viable HH	% Marginal HH
Bela	8	5
Dildo	13	15
Average Surveyed Village	10	10

Other cultural factors make HH Non-Viable or Marginal beside Project land acquisition. It is not surprising, therefore, that the society has developed traditional coping mechanisms.

⁶ The economic impact on the $\frac{3}{4}$ of the population will be discussed in the section on how much land the Project has acquired from single HH, section 4.1.

3. Outside Pressure on Local Productive Resources

It is a widespread belief elsewhere in Chad, and among lenders and NGOs, that the presence of the Project in the OFDA attracted a population influx of job seekers, creating extensive pressure on local resources. Village surveys demonstrating the current demand on natural resources; when conjoined with past population information, illustrate the extent to which Project job-seekers have had an impact on area resources. (Very little).

3.1. Outside Project Workers Who Settle in the Villages

Most of the workers on the Project who came from other parts of Chad lived, not in the villages or even in the OFDA, but in the two major urban centers of Doba and Bebedjia. 89% of national workers lived in these two towns⁷ and took Project-provided transport to and from work. Some of the local workers also shifted to the towns because transportation was easier. The OFDA village populations were increased by only 0.3% of outsiders; most of this increase occurred in the canton centers:

- Kome Ndolebe added 2.2% of its pre-Project size
- Bero added 1.3% of Bero's earlier population
- Miandoum added 0.5% increase of the village's inhabitants

Any influx that occurred did not, therefore, impact most villages' resources.

3.2. Spontaneous Settlements/ Shantytowns

Outsiders did come in numbers and settle in one part of the OFDA, at Kome Atan. Atan became a spontaneous settlement and in its early days, before settlers had time to build solid buildings, a shantytown. But most of these people came with their families and with the intention of settling there for as long as they found commercial benefits to support themselves.

Kome Atan lies opposite the Project construction camp and was originally established by oil exploration workers when they moved their families, along with the camp, from Sarh to Kome Base in 1994. They and their families rented farmland from Bela, the village where the camp was built, and Atan was initially referred to also as Bela 2. The settlement earned a new name as it attracted service providers from elsewhere to cater to the oil-workers needs. In 1998 the settlement contained 94 HH. At the height of Project construction it had grown by 91% as merchants and service workers moved in to take advantage of the business

⁷ It must be remembered that the "total number of workers hired by the Project" differs from the number of workers engaged by the Project at any one time. Construction demands different skills at different times, so workers did not remain Project employees for the entire duration of construction.

opportunities. Very few of the newcomers were job seekers, as the Project's policy of "No Hiring at the Gate" proved an effective deterrent. As with the original oil workers, Kome Atan inhabitants have a solid source of non-agricultural income (salaries, business revenues); but they also rent (and in some cases "buy"⁸) a small bit of farmland which other members of the family cultivate in the rainy season. The villages which have provided farmland are Bela, which has a population density of 0.38 people per hectare and enough land to keep a field in fallow for 27 years, and Mouarom, with a density of 0.33 people per hectare and 32 years of fallow. The population of Atan adds some pressure to the resources of villages that possess ample land (see Maps in Annex 3).

3.3. A Burgeoning Population and Internal Pressure

Rather than outsiders or the Project putting considerable pressure on local productive resources, it has been the population increase of the local inhabitants that has had most impact.

Villagers will often complain that there is no land left for fallow. But the surveys have shown that for most villages there is plenty of land for a long period of fallowing. What their complaints effectively reflect is the great population increase that has occurred in the recent past, which puts more pressure on fields near the village settlement. The true nature of the complaint would be: I have too few nearby fields to leave them in fallow for very long; because there are more people with such a high birthrate I am going to have to turn sooner to traditional coping mechanisms and get up and move someplace where there is unused farmland.

In 1993 there was a national census throughout the country collecting village (and quartier) population figures. Village chiefs on a *somewhat* annual basis count their populations because they are answerable for their citizens' poll tax payments. In late 2000 and early 2001 the main contractor for Project construction carried out a population count in nearby villages to estimate the labor pool and possibilities for housing workers; this count is probably more reliable than chiefly counts, which may or may not have been updated for that year. From these three sources plus the village surveys it is possible to observe the population growth over 20 years. Between 1993 and the beginning of the Project the local population underwent a major increase.

⁸ A voluntary transaction which has no official standing as the land has not been registered with the government.

Population Change from 1993 to 2008/9

Village	Population Density People Per Hectare			Change Between Years		
	Year	1993	2000	2008/9	Delta 1993-2000	Delta 2000-2008/9
Begada		0.18	0.30	0.36	0.30	0.12
Bela		0.15	0.27	0.38	0.12	0.11
Danmadja		0.45	0.88	1.19	0.88	0.43
Dildo		0.37	na	0.71	na	na
Dokaidilti		0.24	na	0.78	na	na
Madjo Bero		0.16	0.53	0.39	0.37	- 0.14
Mbanga		0.18	0.44	0.49	0.26	0.05
Ngalaba		0.40	0.65	0.63	0.65	- 0.02

Negative rates of increase are a sign that part of the population has hived off and departed elsewhere.

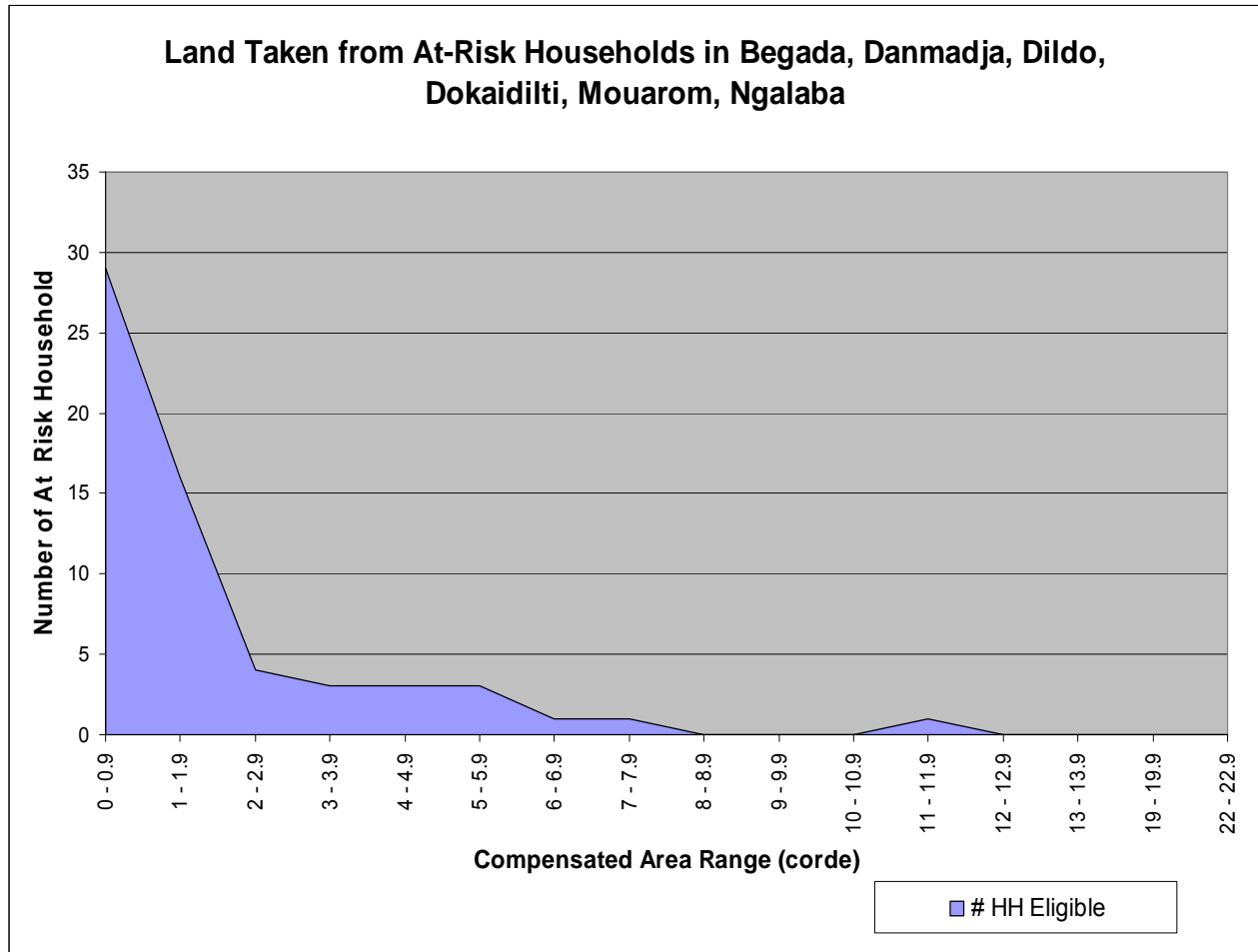
The difference in the rate of growth between 1993-2000 is strikingly larger than the rate of growth once the Project began in 2000 and on up to 2008/9. If the population density in these villages about doubled before the project and grew only by a few points after Project inception, or decreased, the demographic impact of the Project was not as great as natural population increase.

4. Deriving Project Impact on Household Productive Resources from Village Surveys

The Village Surveys present the situation of everyone within a village, not just those who have been compensated. Analysis of such inclusive data has provided understanding of the nature of villages, their size, their composition, and their productive resources. It also allows inter-HH comparison of all HH within a village and between villages.

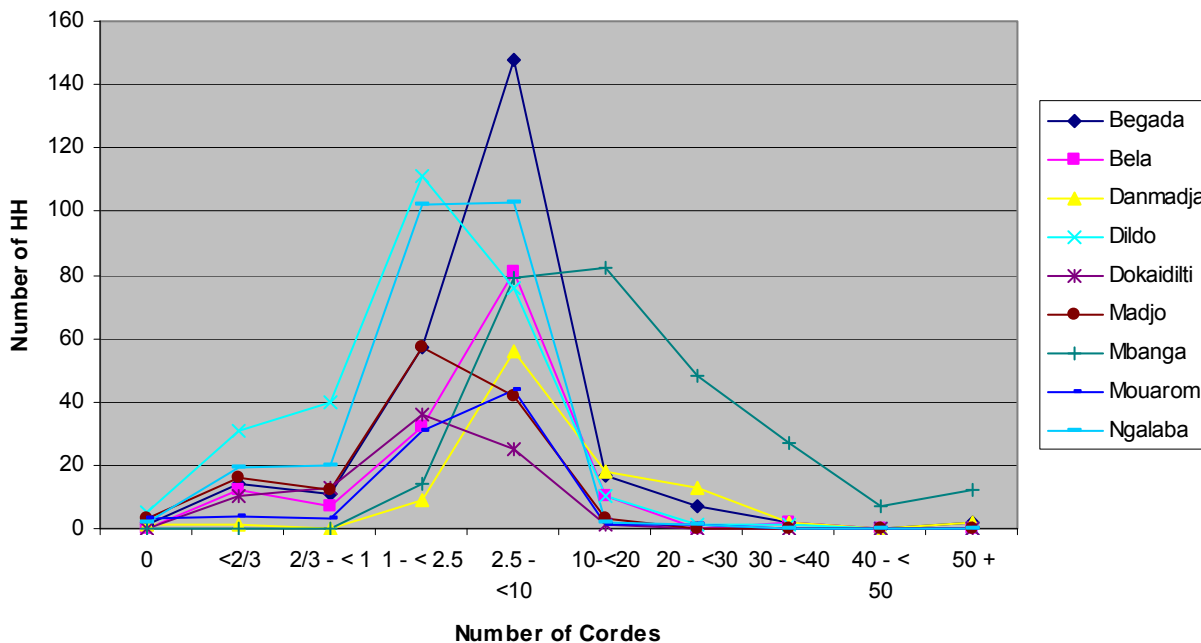
4.1. Effect of Project Land Acquisition on Household Productive Resources

Using the Compensation Database to compare the totals of the amount of land acquired from any single HH shows that only rarely has the Project acquired large parcels of land from a single HH. Most land acquisition involves long, thin corridors of a few meters width for flowlines, roads, power lines and so forth. The largest take would come when a well pad falls entirely within one HH's fields, more when the HH has many fields overlying a rich oil-bearing spot where a number of well pads will be built.



When the precisely measured totals of land taken from HH (graph above) is compared to the Village Survey graph of land distribution shown below, it becomes evident that the small total amount of land usually acquired from a HH is a minor part of most HHs' land holdings. In other words, Project land acquisition has not had a major impact on large or medium size land holders. It is when small land holders (Non-Viable or Marginal) surrender a piece of land, even though a small piece, that the HH feels an impact. The degree of negative Project impact on productive resources is related to the proportion of HH in a village that is already at risk.

Distribution of Land in 9 Surveyed Villages



From the data available in the Village Surveys we know what proportion of HH is at risk (both Non-Viable and Marginal) – 19% – and who they are. The specific HH that are Marginal and have little land and could be made Non-Viable by additional Project land needs are also identifiable. Finally, Non-Viable or Marginal HH that have never been affected by land acquisition are also identifiable; in case their situation changes and the Project compensates a piece of their land any change in status can be calculated.

4.2. Changes in HH Landholding Status

Within each village land per capita tends to be distributed in clusters, each trending around a different size land holding. Zero land holdings are rare; less than 2/3 corde and Marginal (less than 1 corde) tend to run together, reflecting the easy slide from Marginal to Non-Viable. Indeed the 2/3 corde per HHM is an “artificial” divide, reflecting agronomic reality rather than distribution of land among HH. Comfortable land holdings in some villages are the mode, the most commonly encountered size land holdings. But in many villages most farmers have more than adequate land (wealthy), though usually not enormous holdings. Then there are the few holders of family land trusts with very little family to bequeath it to. Because the size of land holdings tends to cluster, switching from one cluster to another requires more of a jump (in this case more of a loss) than moving up or down one or two HH in the ranking of per capita land holdings. Very few wealthy land holders have given up

enough land to become Non-Viable or Marginal, much less just “Comfortable”; the jump from Comfortable to Non-Viable or Marginal occurs more frequently. And, as mentioned, the slide from Marginal to Non-Viable is the most frequent.

The following tables show the extent to which Project land acquisition has changed the land holding status of compensated HH in the 9 villages.

Definition of Land Holding Status as Cordes per HHM	
Zero	No land holdings
Non-Viable	Less than 2/3 corde per HHM or 0.67 corde per HHM
Marginal	0.68 to 1 corde per HHM
Comfortable	1 to 2.5 corde per HHM
Wealthy	2.5 cordes per HHM and above
Sub-categories of “Wealthy”	2.5 to 10 or 11 cordes per HHM
	12-13 to 19 cordes per HHM
	20 to 30-31 cordes per HHM
	Above

The next table will show that the Project has changed the land holding status of about 177 HH in the 9 surveyed villages. In a few instances other factors have intervened to bring about a status change, e.g. the young male HH who was Non-Viable until he inherited 30 cordes after his father’s death.

To make a comparison easier, the second following table shows these changes as a percent of all the HH in the village. When the change in status (whatever the cause -- the Project, inheritance, divorce) is averaged across the 9 villages, 12% of HH have changed status. 3 % have become Non-Viable and 5% Marginal due to the Project or other factors. 8% of HH have become at risk since the start of the Project, and from the time of their first compensation.

Change in Status	Begada	Bela	Danmadja	Dildo	Dokaidilti	Madjo Bero	Mbanga	Mouarom	Ngalaba
nonviable to zero	2	0	1	1	0	2	0	2	0
marginal to zero	0	0	0	0	0	0	0	0	0
marginal to nonviable	2	2	3	4	2	3	3	0	4
comfortable to nonviable	3	1	1	1	1	1	1	1	1
wealthy to nonviable	0	0	0	1	0	0	0	0	0
comfortable to marginal	6	0	15	8	7	4	6	3	7
wealthy to marginal	0	0	0	0	0	0	0	0	0
wealthy to comfortable	14	3	7	3	1	10	15	6	19
Change in Status= Overall Social Impact of Project	27	6	27	18	11	20	25	12	31
Nov 09 nonviable HH	7	3	5	7	3	6	4	3	5
Nov 09 marginal HH	6	0	15	8	7	4	6	3	7
Total At-Risk	13	3	20	15	10	10	10	6	12

% of Village HH that Changed in Status	Begada	Bela	Danmadja	Dildo	Dokaidilti	Madjo Bero	Mbanga	Mouarom	Ngalaba
% nonviable to zero	1	0	1	0	0	2	0	2	0
% marginal to zero	0	0	0	0	0	0	0	0	0
% marginal to nonviable	1	1	3	1	2	2	1	0	2
% comfortable to nonviable	1	1	1	0	1	1	0	1	0
% wealthy to nonviable	0	0	0	0	0	0	0	0	0
% comfortable to marginal	2	0	15	3	8	3	2	4	3
% wealthy to marginal	0	0	70	0	0	0	0	0	0
% wealthy to comfortable	5	2	7	1	1	8	6	7	8
Overall Social Impact of Project : %	10	4	27	7	13	15	9	14	12
% Nov 09 nonviable HH	3	2	5	3	4	5	1	4	2
% Nov 09 marginal HH	2	0	15	3	8	3	2	4	3
% Total At-Risk	5	2	20	6	12	8	3	8	5

These tables indicate that overall project impact, bringing about a change in HH land holding status, has been:

- Highest on Danmadja
- Moderate on Begada, Dokaidilti, Madjo Bero, Mouarom and Ngalaba
- Low on Bela, Dildo, and Mbanga

5. Danmadja: Village and HH Resources Interact

Danmadja's distinctiveness among the other 9 villages has been previously mentioned in terms of length of fallow possible (Danmadja is almost at the brink of no longer being able to fallow land sufficiently); its high population density; and the large number of HH that have changed land holding status. In Danmadja the same proportion of HH received compensation as in most other villages; it resembles the other villages in age and sex distribution, number of HHH by sex and by other criteria. The main difference between Danmadja and the others is that the population increase between 1993 and 2000 was far greater than in the other villages. And again, although like the other villages its increase between 2000 and 2009 was less than in the preceding years; it was still the highest during the Project period of all the 9 surveyed. In Danmadja there are now fewer productive agricultural resources per HH and per capita than elsewhere. Fishing provides an alternative resource but even so its land resources are far more strained than any of the other fishing villages.

Danmadja's distinctiveness is made clear in the following table:

Color code:	Low	Medium		High
HH Size	Smaller	Med Low	Med High	High
Pop Density/ Ha	Low		Medium	High
Length Fallow	More than adequate		Adequate	Barely adequate
HH Change in Status	Few HH change		Mod HH change	High change

Fishing Villages	Population	# HH	HH Size	Pop per Ha	Length fallow	Any Change Land Status
Danmadja	570	101	5.6	1.19	6	27%
Dildo	1 325	268	4.9	0.71	12	7%
Dokaidilti	533	85	6.3	0.78	10	13%
Madjo	839	131	6.4	0.39	26	15%
Inland Villages	Population	# HH	HH Size	Pop per Ha	Length fallow	Any Change Land Status
Begada	1 287	259	5.0	0.36	26	10%
Mbanga	1 497	269	5.6	0.49	26	9%
Mouarom	444	84	5.3	0.33	32	14%
Bela	830	144	5.8	0.38	27	4%
Ngalaba	1 318	249	5.3	0.63	15	12%

This table shows what has been seen above: there is little/no relation between HH size and other village characteristics. (The fishing villages have the largest or larger HH size but there is, at the current level of ethnographic analysis, no social reason for this and it may be simply a demographic difference.) Danmadja, which is short on fallow and dense in population, experienced a much larger shift in HH changing from one landholding status to another. The subtraction of small amounts of land (the typical size of land acquisitions) has had the most impact in Danmadja where more HH are smaller land holders than in the other villages.

Landholding Status	Danmadja % HH Landholding Status	Avg. % of Villages Landholding Status	Comment on Danmadja vs Avg. of other villages
Non-Viable	16	10	Highest of all villages
Marginal	21	10	Highest of all villages
Comfortable	39	35	Equivalent of all villages
Wealthy	25	45	Lowest of all villages

# All Danmadja HH at Factor Per Capita					
HH viability factor	Total # current HH 102	Male HHH		Female HHH	
		before	now	before	now
zero	1	0	0	0	1
<2/3	15	10	13	2	2
<1	21	7	16	2	5
<2.5	40	41	35	8	5
2.5 +	25	30	23	2	2

# Compensated Danmadja HH at Factor Per Capita					
HH viability factor	Total # current HH 88	Male HHH		Female HHH	
		before	now	before	now
zero	1	0	0	0	1
<2/3	12	8	11	2	1
<1	17	5	14	0	3
<2.5	37	38	32	8	5
2.5 +	21	27	20	1	1

A comparison of the graphs on per capita land holdings and per HH land holdings in Annexes 1 and 2 illustrate the same heavy distribution of Danmadja HH in small landholder categories.

So far Danmadja has been coping with its land pressure through traditional mechanisms. The maps in Annex 3 show that Danmadja is already cultivating a large amount of land outside its village boundaries, especially on Mouarom land. This provides some relief to households because the hectares per person density on Danmadja land alone is only 0.68 whereas when the fields outside the village boundaries are added in the hectares increase to 0.85 ha/person. But no more expansion into Mouarom is possible; Danmadja fields are already abutting up against other villages' fields, as the maps show.

Danmadja has followed the traditional village split, which has effectively occurred though not yet officially recognized. As with other villages that have split earlier, the two halves are now mirror images.

Total Population = 570	Danmadja 1	Danmadja 2
Population	369	210
% All Danmadja Population	65%	37%
Pop Density people/cde	1.75	2.07
# HH	61	41
% all Danmadja HH	60%	40%
Average Age HHH	39.0	39.4
Average # HHM	6.05	5.12
Average cde/HH	11	11
Average cde/capita	2	2

So Danmadja has already maximized its ability to spread into a less densely used part of the village.

The Project has offered, through Improved Agriculture training, the possibility for eligible farmers to learn vegetable farming on land bordering the river and this has become quite popular. The farmers sell their produce at Kome Atan market, earning considerable revenue. There is still land for gardens to expand and the market is not yet saturated.

At this point Danmadja appears to be moving onto Bela village land to its east for rainfed farming. Bela is the village with the least land pressure of the 9. The map of Bela land farmed by others shows that some of the farmers with the least land in Danmadja have already made this move. However Bela is currently farming the area closest to its border with Danmadja while the areas closer to Bela's settlement are in fallow.

Danmadja might also choose to divide itself on both sides of the Nya River, similar to Madjo's separation. Should it be the case that Danmadja has reached the limits of traditional mechanisms' capacity to adjust population to land, any future land acquisition by the Project will need to reinforce dry season revenue earning activities or depend on physical resettlement. Should the pilot project for farmers to develop additional rice areas succeed, Danmadja will be one of the prime beneficiaries.

6. Conclusions on Village Surveys

Village Surveys have presented a village-wide and, where neighbouring villages have also been mapped, an area-wide view of the distribution of productive assets. The Surveys have made clear that a geographical area taken as a whole is not undergoing major negative impacts because of the Project. Only a small portion of village households have felt negative

impact, and this sort of impact can come from many other factors at work besides the Project. Whether it is other factors that have put a HH at risk, or not, once the Project acquires land from a Non-Viable HH, the HH can chose a resettlement option that should bring it up to the level of livelihood of an agriculturally viable HH.

In addition, and critically important for the individual inhabitants and HH of the villages, the global village surveys have provided the comprehensive data needed to:

- Identify individually all the currently at risk HH in a village
- Examine the particular characteristics of each of these at risk HH
- Search whether there are common characteristics among at risk HH
- Use these common characteristics as indicators of the HH's current or future risks to their productive assets

The next sections of this report cover:

- The current status of all vulnerable HH in each of the 9 villages
 - Which HH have chosen a resettlement option and which need to be offered one
 - How well has the HH's resettlement option served to restore or improve their livelihood
 - The situation of Marginal HH that might slip into Non-Viability if affected by future land acquisition.
- The impact of livelihood restoration on HH incorrectly identified as vulnerable and that received a resettlement option
- HH that demonstrate the common indicators of Non-Viability and Marginality that can be used to watch out for negative impacts on their productive resources.

7. Household Surveys' Capabilities

The village-wide surveys have show that only a portion of HH are at risk and revealed the vulnerability factors tied to age and gender plus other factors that leave certain HH more open to feeling Project impact. It is the HH surveys that provide detailed information about level of livelihood, disabilities that make someone vulnerable, HH composition. For this Annual Individual Survey the capability for indicating group characteristics of, rather than the specifics of HH surveys, such as concatenations of vulnerability factors in specific HH will be examined.

7.1. HH Surveys' Capacity to Identify Households' Productive Resources

The HH survey, by making sure that any individual can belong to one and only one HH, and the Land Survey, by attributing every piece of land to its holder, is able to make sure that each HH's productive resources are fairly represented. Within a surveyed village the HH that need resettlement options are measured and known, plus whether they received one or not. The Village Surveys also identify the HH that in the declarative Compensation Database appeared Non-Viable and received a resettlement option even though they are in fact agriculturally viable. The advantage of this clear identification is that the EMP socio-economic team can henceforth concentrate on ensuring that only truly Non-Viable HH have attained livelihood restoration. Monitoring viable people who have effectively used their option to increase their livelihood standard above the adequate level where they were before serves to demonstrate positive Project impacts but does nothing to help those who are not viable and need support. Furthermore, past monitoring of livelihood restoration can now be related to results of the Village Surveys; many of those who fail, who have not put their skills learned through the option they chose to use, turn out in fact to be perfectly viable HH, probably uninterested in an activity which during the training period brought benefits to the household but which is, effectively, superfluous to their needs.

The Village Surveys provide the data needed to comprehend affected people's true situation. They work as follows: in the logic table below, the columns "Fact" represent the HH's real situation – a HH is or is not agriculturally viable. The rows "Evaluation" represent the findings from the data collected. In the past when the Project acquired land from a HH, it was evaluated as being either Viable or Non-Viable after this land loss. When judged Non-Viable the HH has been offered a Resettlement Options.

Table 1 : Compensation Database Information versus Survey Methodology Measurements

		Fact	
		Not Viable	Viable
Evaluation	Not Viable	True positive	False positive
	Viable	False Negative	True Negative

According to this logic, four situations can occur and the ideal survey method is one that makes a clear distinction between true positive and true negative without creating false positive and false negative. The Village Survey method by objectively quantifying productive resources and eliminating one “dependent” being claimed by multiple HH is able to do this.

True positive: Individuals affected by the Project who are truly non-viable and were evaluated as such. These individuals have chosen their resettlement option and it is important for the project to monitor them to ensure they achieve livelihood restoration.

False positive: Project-affected individuals that seemed non-viable according to information in the declarative Compensation Database and who chose a resettlement option but in fact have been economically viable all along. The project has no further obligation to these people unless future compensations render them non-viable,

True Negative: Project-affected individuals that are truly viable and that appeared viable according to Compensation Database information. They were not offered a resettlement option and the project is not engaged with these individuals or HH.

False Negative: Project-affected individuals that appeared viable according to compensation data but who, in fact, have neither enough land nor enough income to be economically viable. Until the Village Land Survey identified them as Non-Viable they have not been offered a resettlement option. This is the worst possibility and the one which LUMAP has been using the Village Survey information to detect and correct.

Since the Village Survey method allows the Project to quantitatively differentiate those needing resettlement options from those who have enough productive assets, we also know those individuals/HH who were misdiagnosed in the past and have received resettlement benefits. We can also determine those who will not need benefits in the future even though they surrender a measured piece of land, given the large amount of land they have at their disposal. In the future, other than verifying that a HH's status has not changed (and registering the data if it has), Project resources can be concentrated on the HH that need help.

7.2. Red Flag HH

In villages where fewer HH have been compensated for land, a complete Village Survey would reveal only a small number of False Negatives missed among the small number off compensated HH. A Village Survey here would cover many individuals and HH that had no direct relationship with the Project. In these villages households were instead selected using the Compensation Database and three socioeconomic filtering tools. These tools extracted only compensation information that experience has show is more likely to be true and less likely to be misrepresented.

The filtered Compensation Database information for these households when compared with actual Village Land Use Survey results⁹, indicates a high degree of correlation with non-viability (the HH has a good chance of being At-Risk). However, because a Village Survey shows every field, users of unattributed areas can be tracked down. Red Flag land holders may not identify all their far-away or long fallow fields, so they may in fact possess more productive resources than they appear to have. The Red Flag method works less well at excluding False Positives than the complete Village Land Use Survey. Assisting a few False Positives in these villages can only benefit the village whereas excluding them via Village Survey would require intense work.

545 HH have been examined through the filter and Red Flag process and the results will be analyzed in 2010.

⁹ Village Surveys and Red Flag HH surveys were begun at the same time. When the Village Survey's capabilities became evident the surveys were extended to other villages in which lived some of the compensated individuals had already been "Red Flag" surveyed. Thus EMP-IS has data about the individual/HH productive resources and what the individual/HH claimed were his productive resources.

8. Household Results

HH analysis done to date concerns mainly HH productive assets and the principle factors in vulnerability. Specific factors such as handicaps have been dealt with so far on a case to case basis in the field, but further 2010 analysis of HH surveys will systematize this.

8.1. At Risk Project-Affected HH in 9 villages

Some truly Non-Viable HH in the 9 villages have already benefited from a resettlement option and their progress will be examined later. Others were missed, not identified as Non-Viable during the collection of compensation information. All in all, in the 9 villages, there are at this point:

- 58 False Negatives, true Non-Viables surrendering land to the Project who escaped identification before the Village survey was carried out.
- Of the remaining Non-Viable compensated HH in the 9 villages, 30 were True Positives, correctly identified as vulnerable and benefiting from a resettlement option.

Village	zero to <2/3 corde			2/3 to <1 corde		
	Total	# True Positive	# False Negative	Total	# True Positive	# False Negative
Begada	9	4	5	10	5	5
Bela	5	4	1	1	0	1
Danmadja	12	4	8	17	6	11
Dildo	10	3	7	16	6	10
Dokaidilti	9	8	1	12	7	5
Madjo Bero	10	4	6	9	5	4
Mbanga	10	0	10	13	4	9
Mouarom	6	1	5	3	0	3
Ngalaba	17	2	15	15	2	13
Total	88	30	58	96	35	61

Among the remaining HH in the villages, a number appeared to be vulnerable according to the information they gave to compensation agents and socioeconomic monitors. As a result they have also benefited from resettlement options although in fact their circumstances did not call for it. It is not only to the community but to the Project's advantage that 35 viable but marginal HH received such benefits; they will, if they have made positive use of their resettlement benefits, be prepared against any future land take that may reduce them below the agricultural viability threshold. Which Marginal HH with options have improved their livelihood is known as they have been monitored up until now

Wealthy and comfortably well off individuals were also misidentified as vulnerable (False Positives). Those that have benefited from their options are now even better off, and those who have been unable to or have not wished to gain from it are none the worse off.

HH With Resettlement Options		
Village	Comfortable	Wealthy
Begada	13	16
Bela	3	4
Danmadja	11	6
Dildo	17	13
Dokaidilti	17	4
Madjo Bero	29	18
Mbanga	18	27
Mouarom	5	2
Ngalaba	24	22
Total	137	112

Thus the current status of all vulnerable HH in each of the 9 villages is:

- **73 have chosen a resettlement option, and**
- **21 need to be offered an option during 2010 for the class of 2010-11**
- **60 Marginal HH remain at risk (i.e. that may become Non-Viable with future land acquisition) because they have not already been fortified with a resettlement option.**
- **5 of these Marginal HH demonstrate vulnerability factors that qualify them immediately for a resettlement option as a preventive measure**

8.2. Level of Livelihood Restoration of Non-Viable HH through their Resettlement Option in 9 villages

How well have the HH resettlement options served to restore or improve Non-Viable HHs' livelihoods?

- Livelihood Restoration of truly Non-Viable HH
 - About 500 HH benefited from a resettlement option long enough ago to have established a track record of performance. Their histories were examined and they were interviewed for livelihood restoration training. Those who had never used their training or were lackadaisical were not offered the option,

- o 211 had done well enough in reestablishing themselves that they were offered reinforcement training in 2009 (with more specialization training for those truly capable of specializing in skills needed by the community planned for 2010).

Level of Livelihood Restoration of ALL Trained HH

Level of Livelihood Income from All HHM	
	% HH
less than need	19% *
meet need	13%
2-5 times need	31%
5-10 times need	13%
10-20 times need	25%
more than 20 times	19%

* 13% just below threshold but who are also long-ago graduates who are unlikely to improve

- Section 8.6 below considers the impact of livelihood restoration on Marginal HH incorrectly identified as vulnerable and that received a resettlement option as well as truly Non-Viable HH.

8.3. How vulnerable have the unrecognized HH without sufficient agricultural land been over the years?

The Village Surveys have succeeded in uncovering 105 “False Negatives”, people incorrectly classified as “Viable”. They have surrendered land to the project but have not been recognized as needing a resettlement option. What has been their degree of exposure over the time since the Project began? (2002 and 2005 were the worst years for missing vulnerable HH).

The year a household becomes technically “non-viable”, i.e. the year the Project acquires land that puts it below the 2/3 c/HHM threshold, is not the same year in which the HH begins to suffer. A HH has a year’s grace, time to find additional land and / or put its fallow fields into cultivation, because compensation covers one year of a household’s needs and the cost of putting new land into cultivation.

The following tables cover 82 of the False Positive Non-Viable HH, those for whom the length of non-viability analysis has already been done.

Year	<i>False -</i>	True +
1998	0	2
2001	3	2
2002	12	4
2003	4	4
2004	0	7
2005	11	3
2006	7	6
2007	7	0
2008	2	6
2009	1	7
Total	47	41

Year	total NV	already NV	NV by compensation
1998	2	1	1
2001	5	5	0
2002	8	8	8
2003	5	5	3
2004	6	6	1
2005	9	9	3
2006	4	4	7
2007	3	3	3
2008	3	3	5
2009	3	3	4
total	82	47	35

In a crop rotation system the amount of land a HH needs to retain multi-year viability is $2/3$ c/HHM./HHM. This amount can be either in active fields or fallow. What happens when a HH surrenders land to the Project and falls below the $2/3$ c/HHM threshold depends on how much land remains in their land holdings:

- Enough to cultivate and leave some in fallow
- Enough to cultivate but little or no land to fallow
- Nothing to cultivate

In the first year of non-viability the HH will, if it can, cultivate as much land as required to produce the crops it needs. This means putting some or all of its fallow into production or keeping its fields under crops for a longer than optimal time. Either way its remaining land will no longer have time to recover fertility, and year by year the crop yield will decline. The number of years it will take for the HH standard of living to fall will depend on how much land it has left.

The majority of HH that remained unidentified as agriculturally Non-Viable over the years were already Non-Viable before they surrendered any land to the Project: 57%. Giving up land may have aggravated their situation but they were already scraping by without enough. In 43% of the cases that went unrecognized, it was Project land acquisition that pushed them into agricultural difficulty.

Degree of Vulnerability When Compensation Made Non-Viable OR Already Non-Viable									
Village	Begada	Bela	Danmadja	Dildo	Dokaidilti	Madjo	Mbanga	Mouarom	Ngalaba
Enough to Fallow	3	2	5	5	5	4	5	1	9
Not Enough to Fallow	5	2	7	3	4	6	5	1	8
No Land	1	1	0	1	0	2	0	0	0

Only if a HH has lost almost all its land at the time of land acquisition will its situation decline rapidly as it has no land to put into production in the next farming year, unless the HH can access land from kin, borrow or rent. The compensation paid for the land more than covers the cost of food for 1 year and the price of renting land for a year. 3 HH have been left with no land over the years. Clearly they have managed to get by, even though “agriculturally Non-Viable”. Some individuals and HH maintain a reasonable standard of living in the village through other sources of income than agricultural production. In and of itself having less than 2/3 c/HHM does not mean a HH is economically non viable, only that it must have other resources than farming to sustain itself.

Non-Viable HH Without Resettlement Options over the Years

	False Negatives		False Negatives No Land	
	Already NV	Year became NV	Already NV	Year became NV
1998	0	0		
2001	3	0		
2002	7	5		1
2003	2	1		
2004	0	0		
2005	7	1	1	
2006	3	2		
2007	1	4	1	
2008	0	0		
2009	0	0		
Total	23	13		

Of the 3 Non-Viable HH with no land, the gentleman (uneducated) made non-viable in 2002, although not elderly (only 55 at the time), used the occasion to “take retirement”; since that time he has been supported by his children. The woman (uneducated) who became Non-Viable in 2005 is living in her natal village and has borrowed a field in which she grows peanuts, sorghum and beans. She makes additional money by selling fish and sundry condiments in the village. By contrast, the lady who became Non-Viable in 2007 had moved from another sub-prefecture after marrying a local man in 2001. She did attend primary school but can no longer read or write. She cultivates land belonging to the father of her child, who has moved to Ndjamena. One child of her own, age 5 and another foster child 6 years old are her dependents. She manages well enough to have started out the hungry season with ½ sac sorghum, enough to feed all three of them.

Earning money working as a day laborer and hairdresser allows her family to each fish once a week and meat once a week also. Facing the future, however, the question remains whether her husband and his family will continue to let her use the land once her biological child is old enough to leave its mother (hence the importance of a resettlement option).

8.4. Effective Actions Increasing the Likelihood of Livelihood Restoration

For the earlier identified “Non-Viable” HH whose training has put them near to reaching the threshold of viability LUMAP implemented a variety of restorative actions in 2009, all of which appear to have been effective. These actions have been integrated into the Environmental Management Plan’s (EMP) Land Management Manual (LMM) and are now “business as usual” for all EMP activities.

- Basic Business Skills (Literacy and Arithmetic skills training using HH and rural micro-enterprises as the texts)
- Training to reinforce Improved Agriculture or Off Farm Skills
- Provide specialized training and or equipment offering competitive advantages

8.4.1. Basic Business Skills

One of the main complaints of the institutions training Non-Viable individuals has been how difficult it is to train illiterate or semi-literate students; they have managed to adapt their training away from theory to teaching by doing, but it is difficult for students who cannot write down the measurements of a cabinet or how much received for a sack of grain to manage their livelihood restoration.

The earliest Off Farm and Improved Agriculture graduates received training in business management however later students did not. The Basic Literacy, Arithmetic and Business School (BBS) is now a prerequisite for all eligible people who wish to benefit from a resettlement option. Like Improved Agriculture training, the lessons are given in the village and anyone can attend. The first BBS class attended in 2009.

- 157 of the 171 eligible students attended classes and graduated
- 12 eligible Non-Viable people refused to attend; 2 did not attend often enough to pass
- 180 auditors turned up and voluntarily attended the classes, benefiting from the training

- I.e. as many volunteers received training as did Non-Viable people required to attend.

The class results were most encouraging. Of the 14 eligible students who did not make the grade in BBS, 12 refused to attend, 2 participated only rarely and received low grades of 0.7 and 0.8. The majority of students received grades that put them in the upper ranks of the class and one graduate was “cum laude”.

Report Cards of Eligible Students						
Scoring Grades*	0 - 1.4	1.5 - 2.9	3 - 4.9	5 - 7.4	7.5 - 10	Total # eligible students
# of students	14	12	49	98	1	174
% of students	8%	7%	28%	56%	1%	100%

* The grading was done on a basis of 10 points

These grades are for the eligible Non-Viable students only; the auditors participated in the classes but were not asked to take a test.

- 88% of tested participants succeeded in reading Ngambaye, doing calculations and understanding management.
- The usual traditional problems have constrained the mastery of business techniques—lack of communication between spouses, alcoholism, etc.

The female students did just as well as men and a majority of the volunteer students were women.

2009 BBS	Total females	Total Males
No. eligible students	21	153
Avg. grade	4.8	4.8

Optional Post-Training Reinforcement of the skills acquired in BBS took place during the 2009 rainy season.

- 146/157 eligible BBS graduates participated in the reinforcement

The evaluation at the end of the reinforcement showed the following results:

- Literacy: 90% of the resettlement beneficiaries are able to read and use Ngambaye to take notes, read and do planning.
- Management and Business Skills:
 - 30% of beneficiaries use the notion of budgeting for the HH and for their business.
 - 40% have mastered addition, subtraction, multiplication and division.
 - 40% use elementary family budgeting.
 - 20% know how to develop a planning budget, plan for priority needs and calculate revenues
 - 30% have mastered financial management of a small business and of a HH
 - 70% are motivated to do better
 - 90% have understood the concept of business creativity and innovation.

Post-Grad Reinforcement	Good	OK	Weak
Total	72	26	45
% Success	50%	18%	30%

To improve the teaching of basic business management the NGO implementing the project hired a management specialist to improve the training materials for 2010.

The BBS classes contained both people who had attended some level of school and others who had no schooling whatsoever. They were divided into groups according to their background. The trainers found that among those who had never been to school “their level of assimilation was slow but good....They take the course and its contents very seriously. Their attitude paid off and they finished the class having learned the material.”

The following two tables¹⁰ are interesting to compare with the results of BBS. The first table covers the craft earnings of graduates related to their educational level reached in earlier years (table covers all graduates, whether viable or not):

¹⁰ Taken from 2008 Annual Individual Report

Earning In Thousands of FCFA by Month by Educational Level.

Educational Level	Minimum CFA earn per month	Maximum CFA per month	Mode CFA per month
Illiterate	6 K	60 K	10-20 K
Primary	1 K	105 K	10-20 K
High School	5 K	35 K	10 K
Lycée	30 K	32 K	30-32 K
University	3 K		3 K

Education affects people's outlook on life, not always in a positive way as far as their using the skills they learn through resettlement.

- Having done some primary school versus being illiterate does not greatly impact earning power one way or the other.
- Having attended high school does make a difference to income – positively and negatively.
 - Most people with some high school education who practice their craft earn fairly well.
 - But most people who have not used their training have been either more highly educated or big landholders.

The next table shows the education level of past Off Farm Skills graduates (covers all graduates, whether viable or not) and their performance or lack thereof among graduates uninterested in using their skills. The results are just the same as above.

- People who have attended high school are likely to refuse to exercise their trade.
- The same is true for those land wealthy who have some primary school education. A number refused to practice their trade or did so more and more desultorily.

Graduates Using Skills or Not by Education level

% educational level	% of Total Off Farm Grads	
	% of Total # grads	% of Total Grads NOT Work
% illiterate	16%	3%
% primary	58%	68%
% College	17%	12%
% Lycée	8%	18%
% University	1%	0%

To judge from the comments and demands of those who appear in the table above, those with higher education have very high/overly high expectations of what they should get out of life. Similarly, the sole person who has attended university barely makes any effort to earn with what he has learned (tailoring).

The BBS results from the class of 2009 show the same trend.

Grade	Previous Education Level						
	No School zero	Primary 1 - 2	Primary 3 - 4	Primary 4 - 5	Middle 6 - 7	Lower High School 7-11	High School + 11- 12 + 1 year
F	2	3	0	0	0	0	3
D	1	1	0	0	0	1	0
C	8	3	2	1	1	3	0
B	9	15	3	3	6	9	7
A	0	0	0	0	0	0	0

Understanding what is being taught during the training is easier with some education. Mastering basic business skills/rationale also helps people manage their capital and labor. Illiterate graduates are the most likely to be putting their skills to work. As BBS in 2009 showed, they take their training very seriously. Some high school students refuse to work; those who do work do well.

8.4.2. Training in Reinforcement and Specialization

Reinforcement training was arranged for 211 graduates who were earning revenue with their skills but had some weak points¹¹. Out of the 211 reinforces 209 participated, the other 2 first asked for reinforcement but later insisted that they get some other type of training instead and were refused. Except for tailoring most of the income results are in and the reinforcement was in most cases highly successful. The overall success rate of the training (restored or improved livelihood) was 88%.

8.4.2.1. Reinforcement training in Vegetable Gardening

27/31 succeeded in mastering the techniques. Most trainees now count on gardening as a revenue supplement for purchasing staples rather than rainfed agriculture as a means of support. Having switched their main productive interest to gardening, they are able to support the family by gardening revenues alone.

A + = ready to professionalize in seed production, etc

A = now a professional gardener

B + = a professional gardener but constraint from lack motor pump

C = a gardener but not main activity

D = a sometimes gardener

F = personal problems/ not effective gardener

A+ = 6

A = 9

B+ = 3

B = 6

C = 3

D = 2

F = 2

5 of the reinforcees specialized in rice farming.

The reinforcement in rice farming succeeded with 4/5 but all their harvests did not yield the results possible with appropriate seed (only poor varieties available).

¹¹ Reinforcement training was arranged early on in the Village Survey process; all graduates who would and could make considerable advances in their skills were given reinforcement training on the assumption they had been trained because they were vulnerable. For graduates in the 9 villages their objective status was later made clear.

In vegetable gardening as in the other cash-earning activities, the reinforcement training brought out what was already evident with a number of the graduates: various personal problems such as alcoholism which left them uninterested/ unable in practicing their skills. Those reinforcees who fall into this category and who are truly Non-Viable (True Positives) will be offered land in an effort to return the HH to a viable level.

8.4.2.2. Reinforcement training in Animal Husbandry

8.4.2.2.1. Pigs

One now deceased out of 17 trainees. 78% have succeeded in earning enough to meet their families' major needs. 2 let their stud boars die from lack of care, not feeding them enough during the rainy season. One of the two spends most of his time away at Kome Atan working as a laborer.

8.4.2.2.2. Goats/Sheep

15 trained in raising small ruminants with 88% success rate. 1 is counted as a "failure" because her billy goat died when her brother vaccinated it, but she plans to buy another sire and continue with the activity.

8.4.2.2.3. Poultry

43 people were trained (1 now deceased) of whom 36% keep not only chickens but several varieties of fowl. 9% of the reinforcees did not succeed, mainly because of inability or lack of interest in feed and hygiene in the coops.

8.4.2.3. Reinforcement training in Agroforestry

11 people received reinforcement, including 2 women. 1 person signed up then refused training. All but one did well, although some still need more reinforcement in grafting techniques. One nursery now has plants worth 88 000 f CFA. Others earn about 4 000 f CFA each time they take a lot of plants to market to sell. Demand is also brisk within the villages.

8.4.2.4. Reinforcement training in Food Transformation

22 women were provided various kinds of reinforcement (1 now deceased). The reinforcement ranged from training and equipping some women with pasta extruders, oil presses, etc. to bicycles/push carts for those women who were already doing well but could sell in additional markets if they could get there. They are earning from 40 000 to 130 000 f CFA per month.

8.4.2.5. Reinforcement training in Cloth Dying

11 women had refresher training and learned new dying techniques. They earn from 20 000 to 62 000 f CFA each time they prepare a batch.

8.4.2.6. Reinforcement training in Carpentry/Furniture Making

11 carpenters got refresher training and learned how to build additional types of furniture. One has been hired full time at a salary of 90 000 f CFA/month; 3 work almost constantly filling orders from Catholic churches for furniture. A local enterprise has hired 1 as a professional, earning 120 000 f CFA per month. Income results for 3 have not yet been gathered, but all the others work earns them from 40-60 000 f CFA/month.

8.4.2.7. Reinforcement training in Masonry/Roofing

9 were reinforced and re-equipped. 6 are now working as professionals for a local company; 3 earn supplemental revenue during the dry/construction season but also do rainfed farming.

8.4.2.8. Reinforcement training in Tailoring

18 were to be trained but 1 later refused. In the case of tailoring since there are several villages with multiple tailors, the training provided not only reinforcement but also training and equipment allowing each to specialize. For example, in one village 1 tailor is now specialized in making buttonholes, another in binding the edges of cloth and another in embroidery. Now each needs the skills of the other. Training occurred in two phases. From phase one, 15/18 are active as tailors every day, earning from 25000 to 60 000 per month. The others earn about 5 000 per month.

8.4.2.9. Reinforcement training in Welding

3 graduates were reinforced in welding. Experience had shown that the 11 earlier graduates who had refused to exercise their trade did so because they had learned only cold welding which, to their minds, was not what they considered to be "true welding". They graduated so long ago that they had lost the knowledge and skills earlier acquired and were not reinforced because it would have had little effect. All 3 reinforcees are now professional welders with their own workshops in either a main village or at home.

8.4.2.10. Reinforcement training in Fishing and Fish Conservation

Finally, an experimental reinforcement was tried with 7 eligible people who no longer or never exercised the skill in which they had been trained but spent most of their time fishing as their main revenue-earning activity. For this training, the couple, the fisherman and his wife(s) who

do the fish transformation for marketing as fresh or conserved fish, were trained and equipped. The training in transformation and conservation of fish attracted a very large number of other women in the village who also wanted to learn. Based on this learning a dry-season revenue-earning module on fish preparation and conservation has been added to the Improved Agriculture training that will be offered.

8.5. Level of Livelihood Restoration among Non-Viable Reinforced Training Graduates

The Project uses two means of judging livelihood restoration:

1. The affected individual is earning the replacement value in sorghum (yield/corde x price per kilo) of the land that was surrendered to the Project; i.e. the individual can afford to replace the cereal that could have been produced.
2. The individual is earning the replacement value of the amount of land needed to maintain the HH at 2/3 corde per HHM.

The first is the same as livelihood restoration to the same level as before (had all the land acquired been under cultivation at the time it was acquired). What the second standard measures depends on the HH situation before it surrendered that piece of land. As we have seen, many HH are already Non-Viable by agricultural measures alone. Helping them to restore the same level of livelihood as before is a minimum, but does not leave them at an appropriate standard of living. To reach an adequate standard they need 2/3 corde/HHM, only half of which needs to be in cultivation; hence adequate restoration equals ½ of the value in sorghum of 2/3 c. times the number of HHM.

Level of Livelihood Restoration for Reinforced Graduates for Whom Revenue Data Is Available (not yet vegetable farming season)

Non-Viable Reinforced Households' Livelihood Restoration		
Replacement Revenue	Non-Viable replace value land lost	Non-Viable replace minimum need @ 2/3 c/HHM
insufficient	7	2
just	2	1
up to <5 times	8	10
5 + times	3	7
Total	20	20
Still N-V	7	2
Degree NV		
< 1/3 below minimum	0	0
1/3-2/3 below	6	1
> 2/3 below	1	1

After their livelihood restoration training 2 HH still remain, in income-earning power, below the level needed to purchase their minimum needs. Both HH are deeply below the level of earning replacement income. In the case of the few who have not restored their livelihood even with reinforcement in the skills they have learned, if they have not done so by the end of the first year of applying their skills, they will be offered land.

8.6. Level of Livelihood Advancement among Marginal Reinforced Training Graduates

A number of marginal HH have received resettlement options over the years. Those who chose training in Improved Agriculture or Off Farm revenue-earning skills participated in the livelihood reinforcement training if they had demonstrated a history of conscientiously applying their skills. Since these individuals possess sufficient land to maintain their households (just barely), any additional income is an improvement in their livelihood level. The degree of progress would depend on their pre-project earnings. But, as with the Non-Viable HH, it is possible to compare what has been lost with what has been gained. In this case, out of 29 reinforced Marginal individuals, 23 earn the same value or more as they could have produced if ½ their land had been in production and ½ in fallow. 6 had not managed to offset the total amount of land lost, although their HH are still viable.

Additional Earnings of Marginal Reinforced Graduates

Replacement Revenue	Marginal HH Earnings vs. Sorghum Value of Land Lost
Below value of land lost	6
Equal to value lost	5
More than value lost	18
Total	29

9. HOUSEHOLDS AT RISK

As village surveys have been completed and the data on Non-Viable HH has become available, those HH have either been added to the classes of 2008-9 or 2009-10; their situations have been discussed above. These classes are as follows:

- 2008-9 173 (includes people identified as Non-Viable by the compensation database)
- 2009-10 73
- 2010-11 21 (as of current date; others will be added as analysis continues)
 - 17 men; 4 women
 - Located in 7 of the 9 surveyed villages

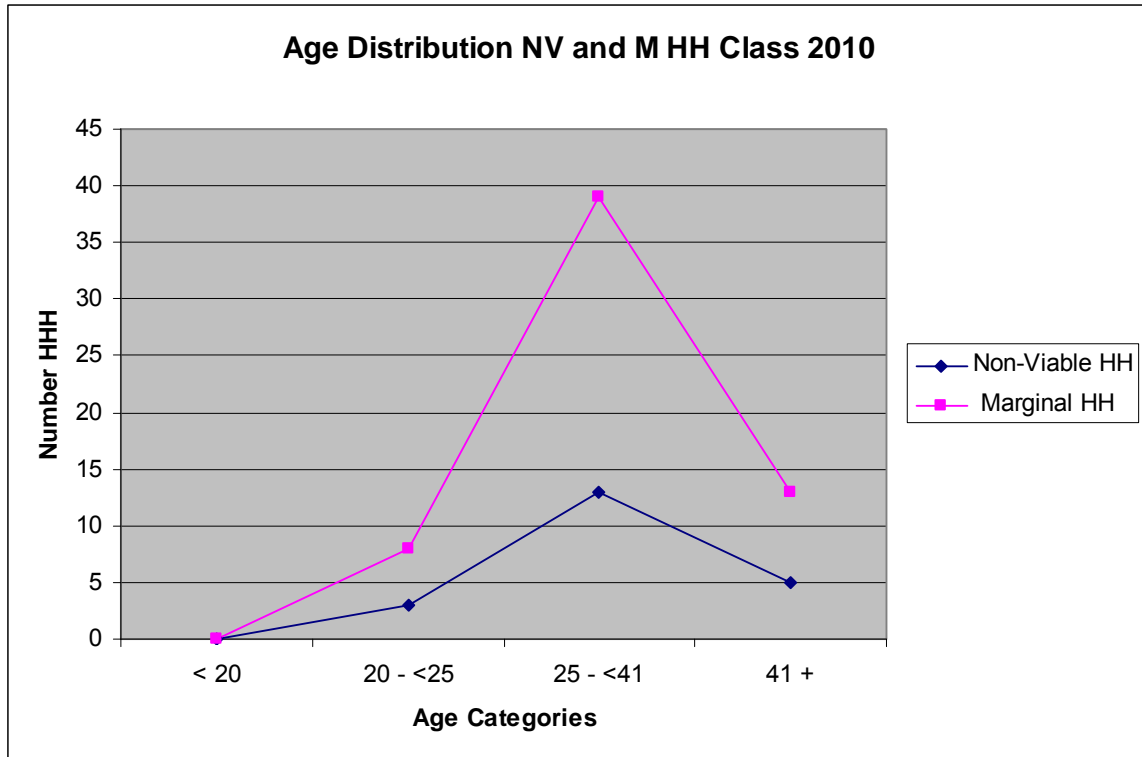
The Non-Viable HH identified by the most recent surveys will be included in the class of 2010-11. In addition, a Management of Change addendum was approved in 2009 making vulnerable Marginal compensated HH eligible for resettlement as a pro-active measure to improve their circumstances. The definition of vulnerable involves a concatenation of the various characteristics that have been examined earlier:

- HHH age 25-39
- HHM = 4 or more
- Handicap
- Residence in non-natal village
- Encounters difficulty in getting through the hungry season

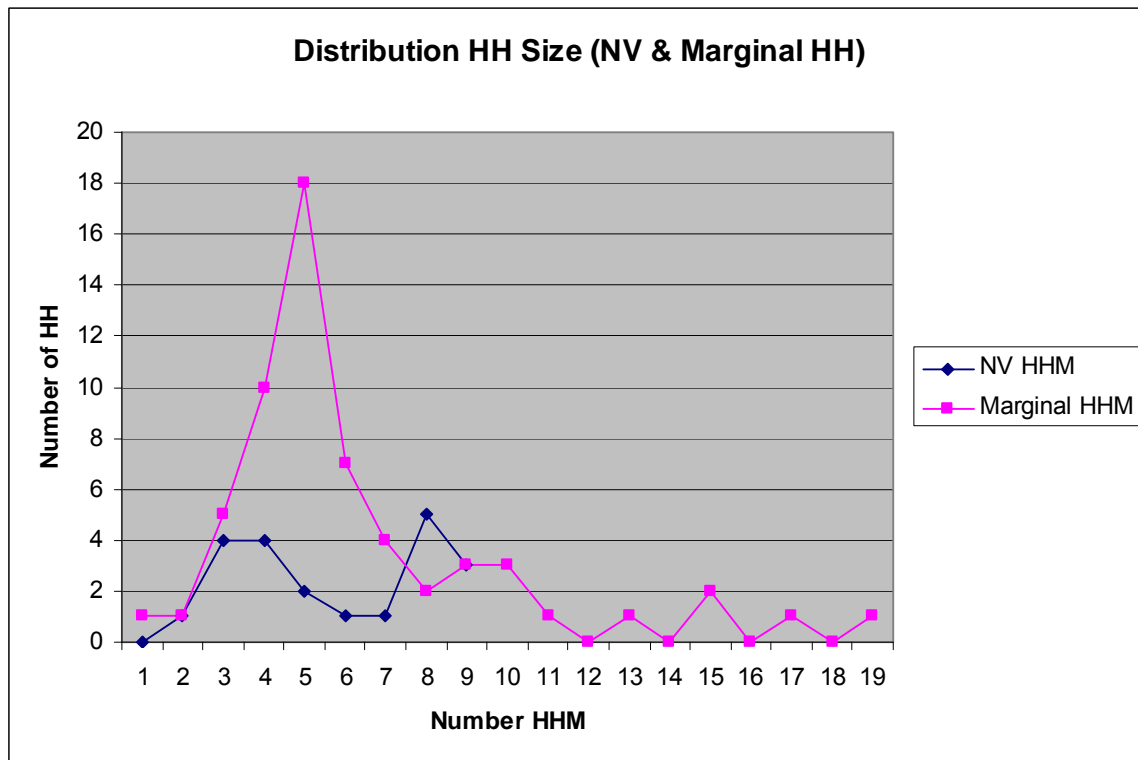
The situation of these Non-Viable and Marginal HH not yet offered an option is examined in the table below. The distribution among Marginal HH is representative of the distribution among HH. But the NV HH numbers are given for information only and do not represent any distribution; too many NV HH have already been offered resettlement options. The numbers below may change as remaining villages are analyzed.

The Class of 2010-11

Class of 2010-11 (Dec 09)	Non-Viable	Marginal	Vulnerable & Marginal	Potential Class Totals
# HH	21	60	5	26
# HHM	120	381	21	141
# M HHH	16	45	2	18
# F HHH	5	15	3	8
Avg. Age HHH	33	35.6	43.2	
Avg. Age M HHH	33.1	32.6	32.0	
Avg. Age F HHH	31.4	44.3	50.7	



By the age distribution of Marginal HH, we again see that the HH that truly have very limited land holdings become evident in their late 20s and their 30s.



The table also shows the common HH size of 5 members but also that numerous Marginal HH have many members using limited common resources.

10. CONCLUSIONS ON LUMAP FINDINGS

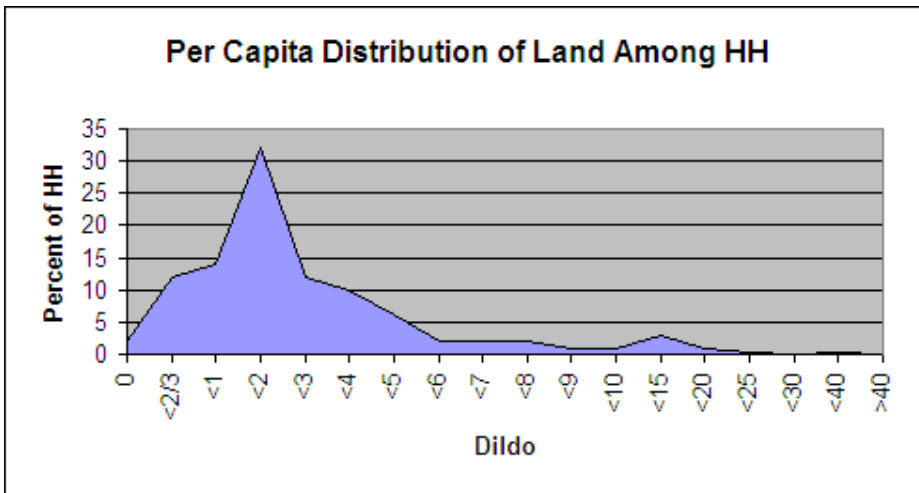
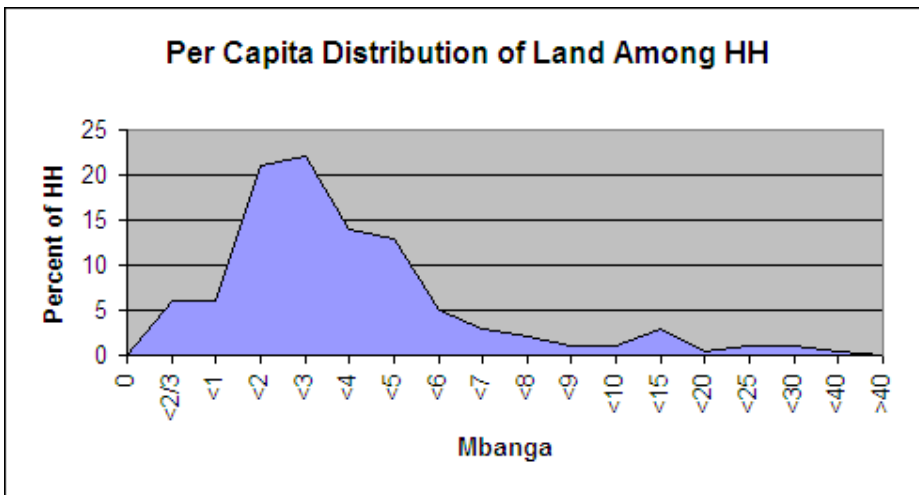
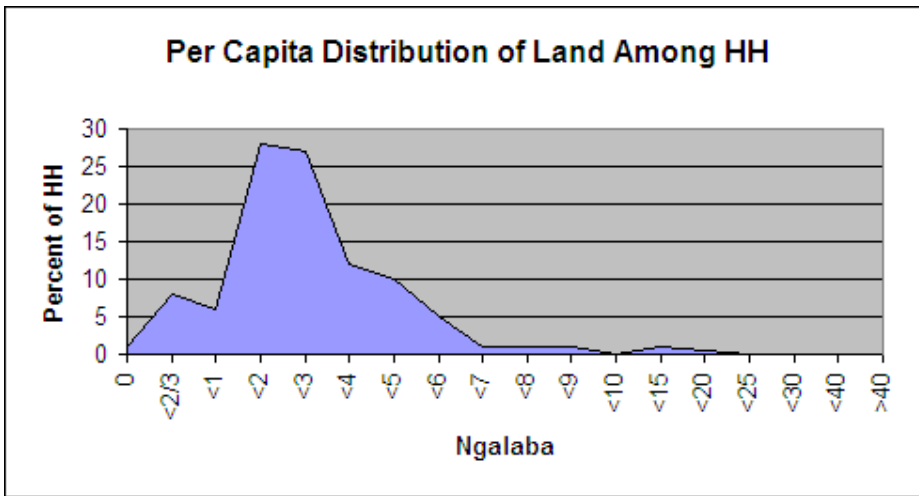
Through the village survey work accomplished between mid-2007 and end 2009 the following points are clear:

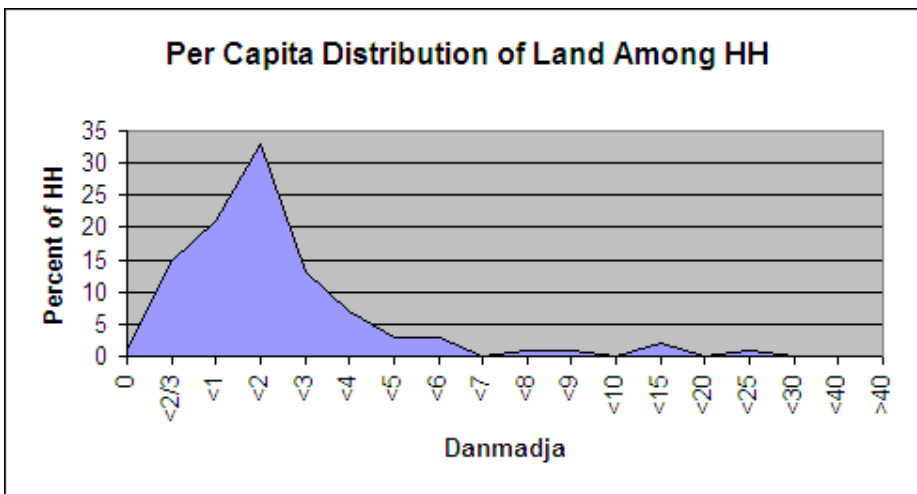
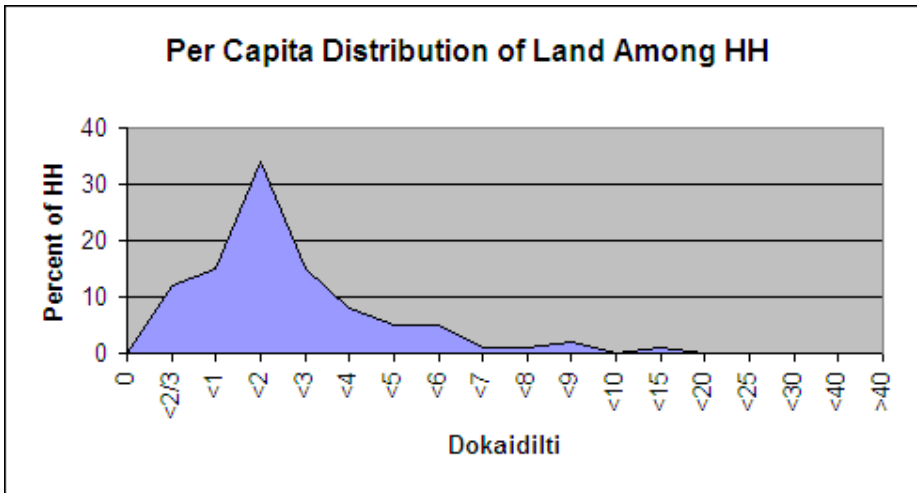
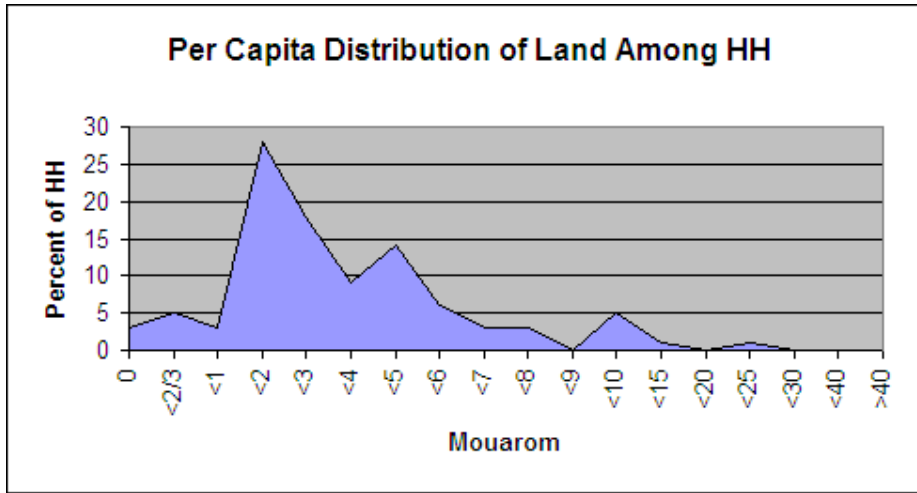
- LUMAP tools have drawn a detailed picture of village and household standing before and during the Project period;
- Impact of Project land acquisition has acted on individual households within the village rather than on the village as a whole;
- A common repartition of productive resources is found throughout the villages, with about 20% faced with below-normal or marginal livelihoods, 35% possessing enough productive resources to earn an adequate living, and 50% of households with enough substantial resources to maintain the household and its offshoots well into the future;
- The Project's land acquisition has in the main led to the decline of marginally viable households into agricultural non-viability; it has also worsened the situation of those already non-viable;

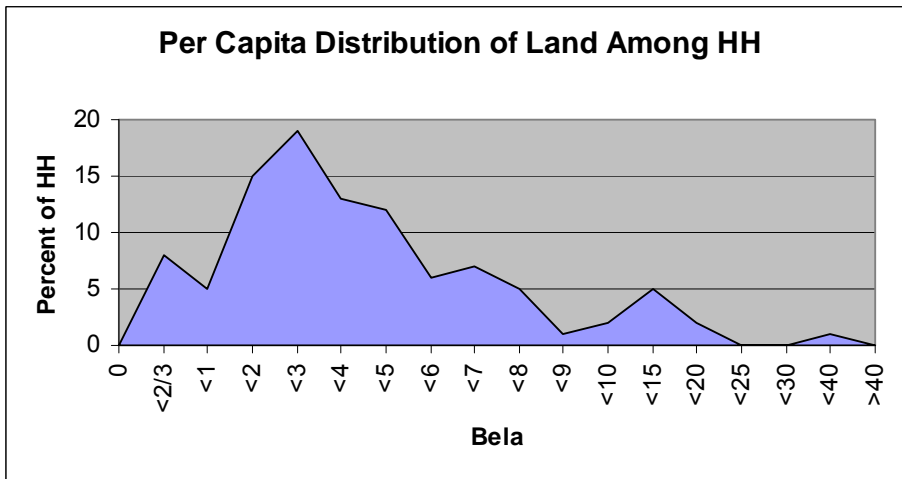
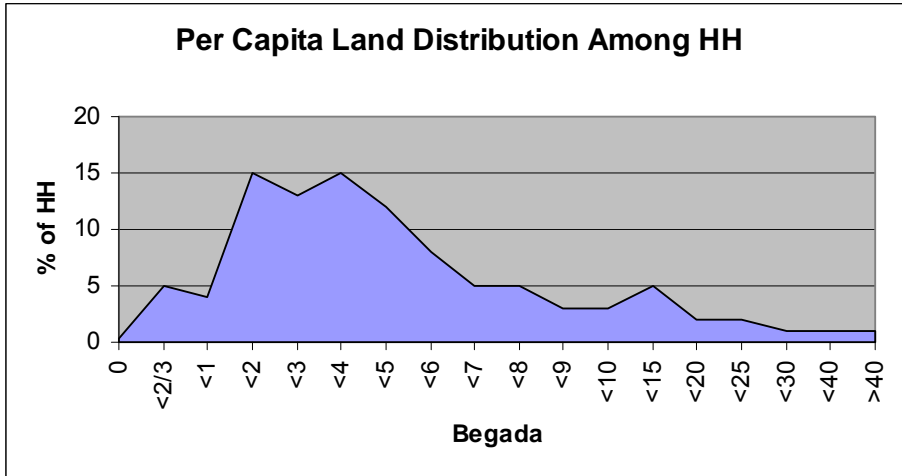
- But the skewed repartition of productive resources reflects the working of traditional social mechanisms for resolving social tensions: moving to another (non-kin) village, setting up an independent household in a non-natal village, both of which can mean abandoning the productive assets previously used;
- These social mechanisms along with village survey results on landholdings allow the pre-identification of households that are most probably at risk;
- The greatest impact on productive resources in the last 20 years has been a population explosion which predated any Project activities;
- Even before this sharp increase in inhabitants, the culture for many years has used social and geographical measures to deal with too much population using too few resources; these measures have remained active up to the present day;
- The resettlement options providing households with alternative methods of increasing income and production have been largely successful; the addition of Basic Business Skills and Reinforcement training have been contributory;
- Some households have failed at restoring their previous level of living through these new options; in these cases the alternative of resettlement/moving to utilize excess land is the only solution. The “Generate New Farmlands” project for developing rice fields is being pursued with this objective;
- The Land Use Mitigation Action Plan has succeeded in identifying affected households that had been missed earlier. They have been or will soon be included in exercising a resettlement option. By the end of 2009 the problem of non-viable households is clearly at a manageable level: 21 still to be consulted on choice of option for 2010.

Annex 1

Per Capita Land Holdings per HH

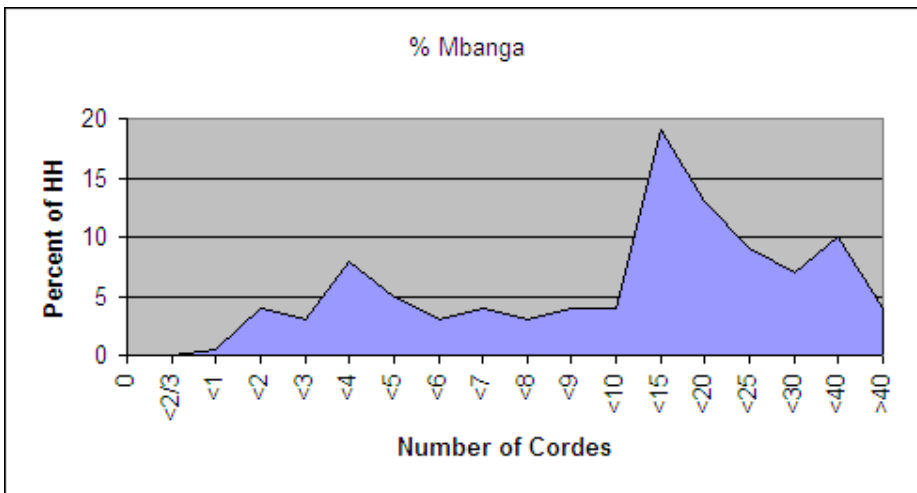
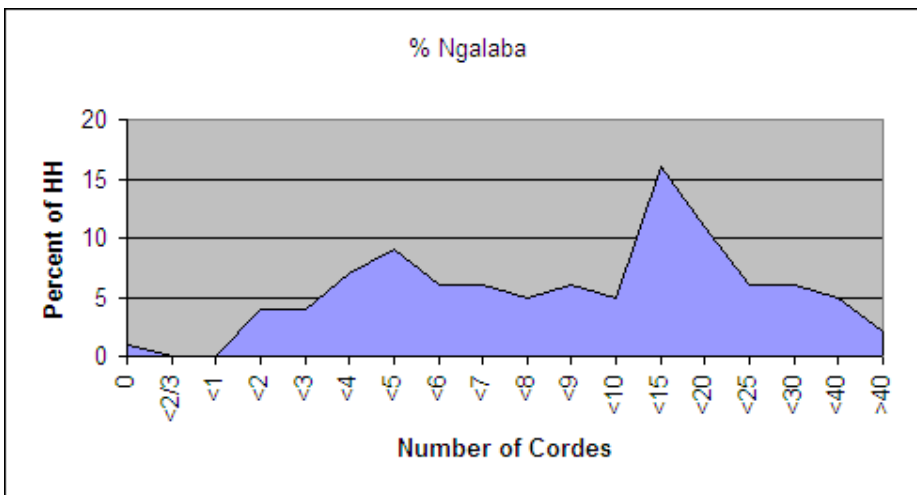
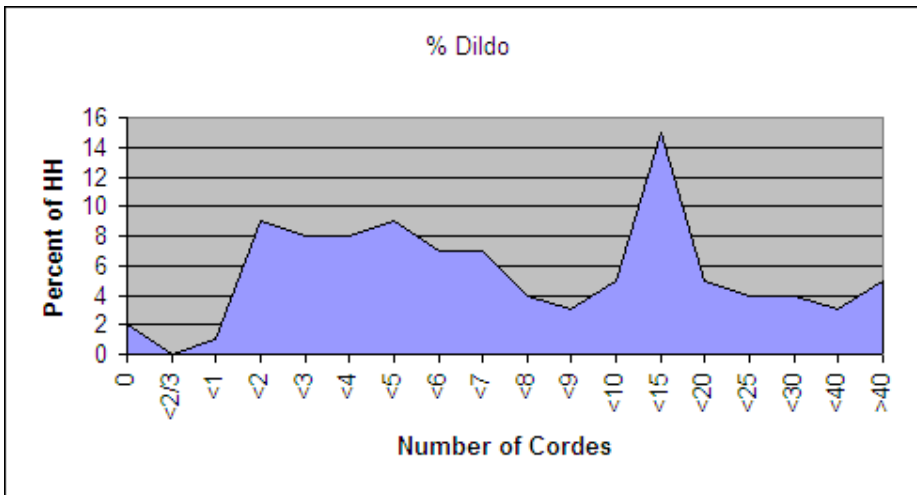




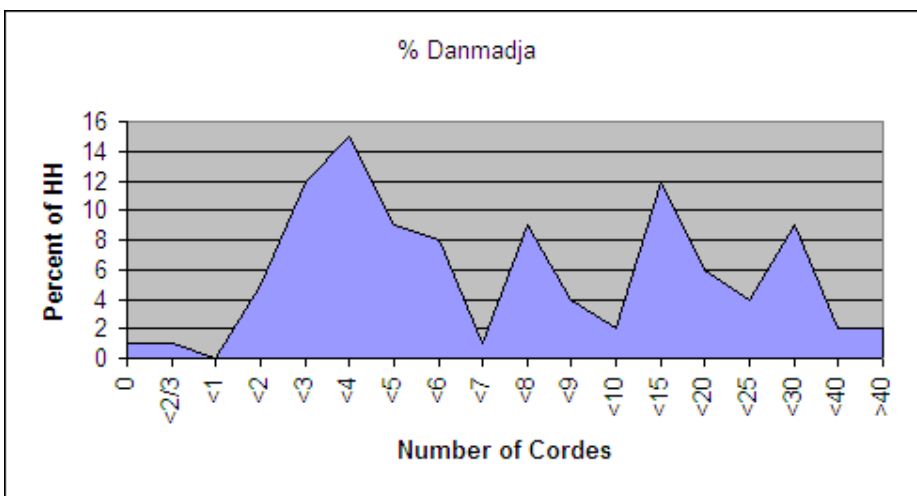
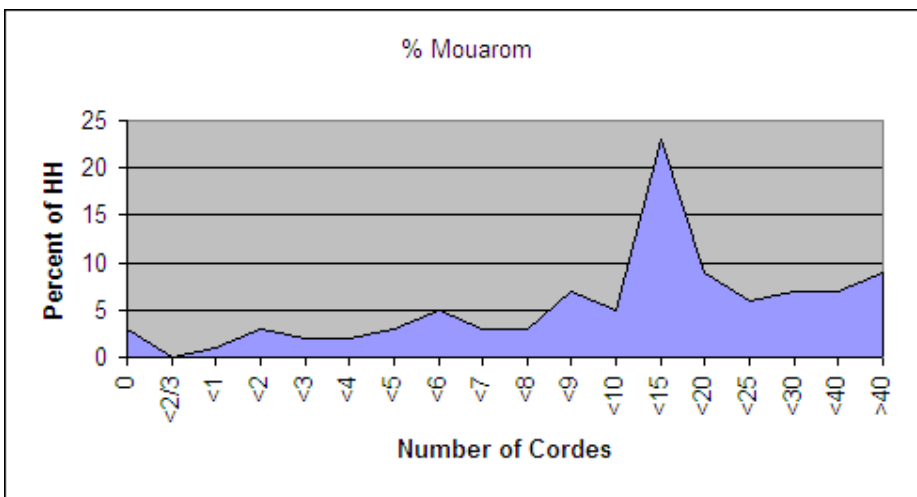
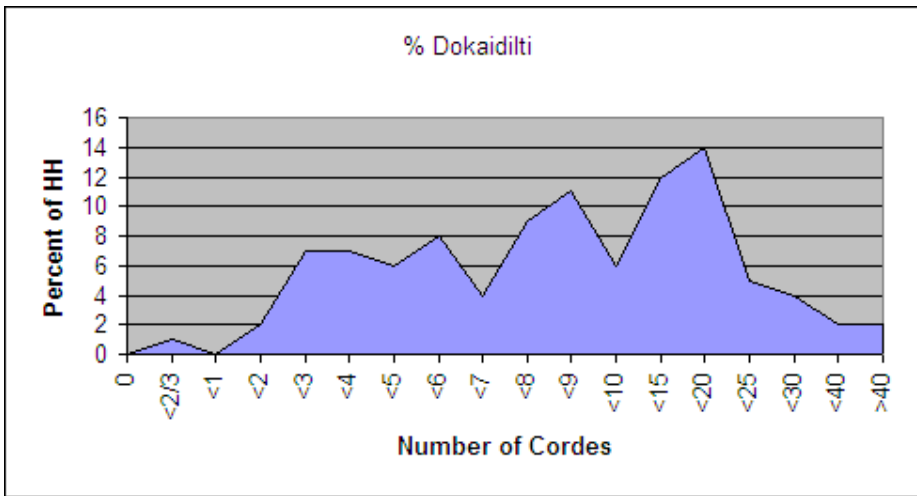


Annex 2

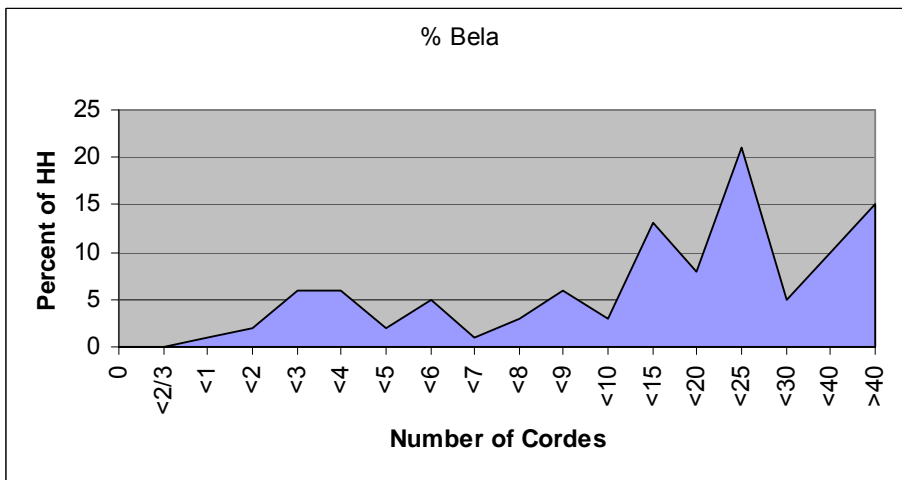
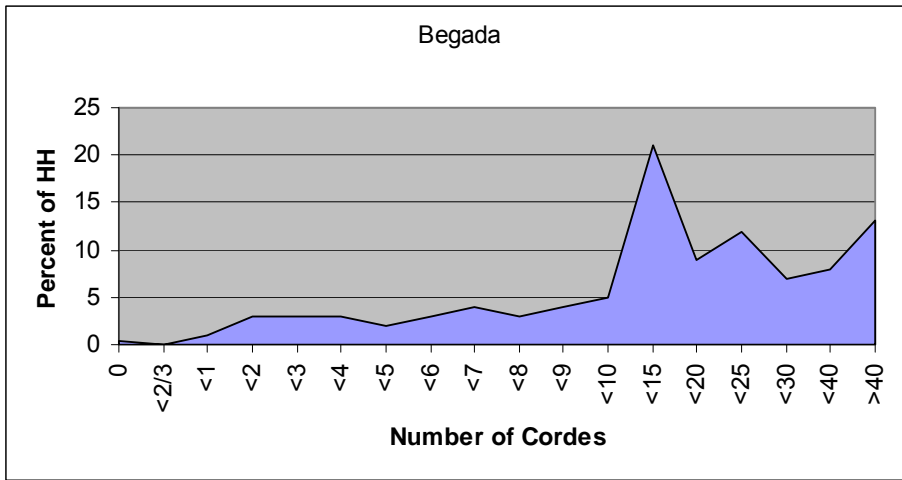
Land Holdings per HH



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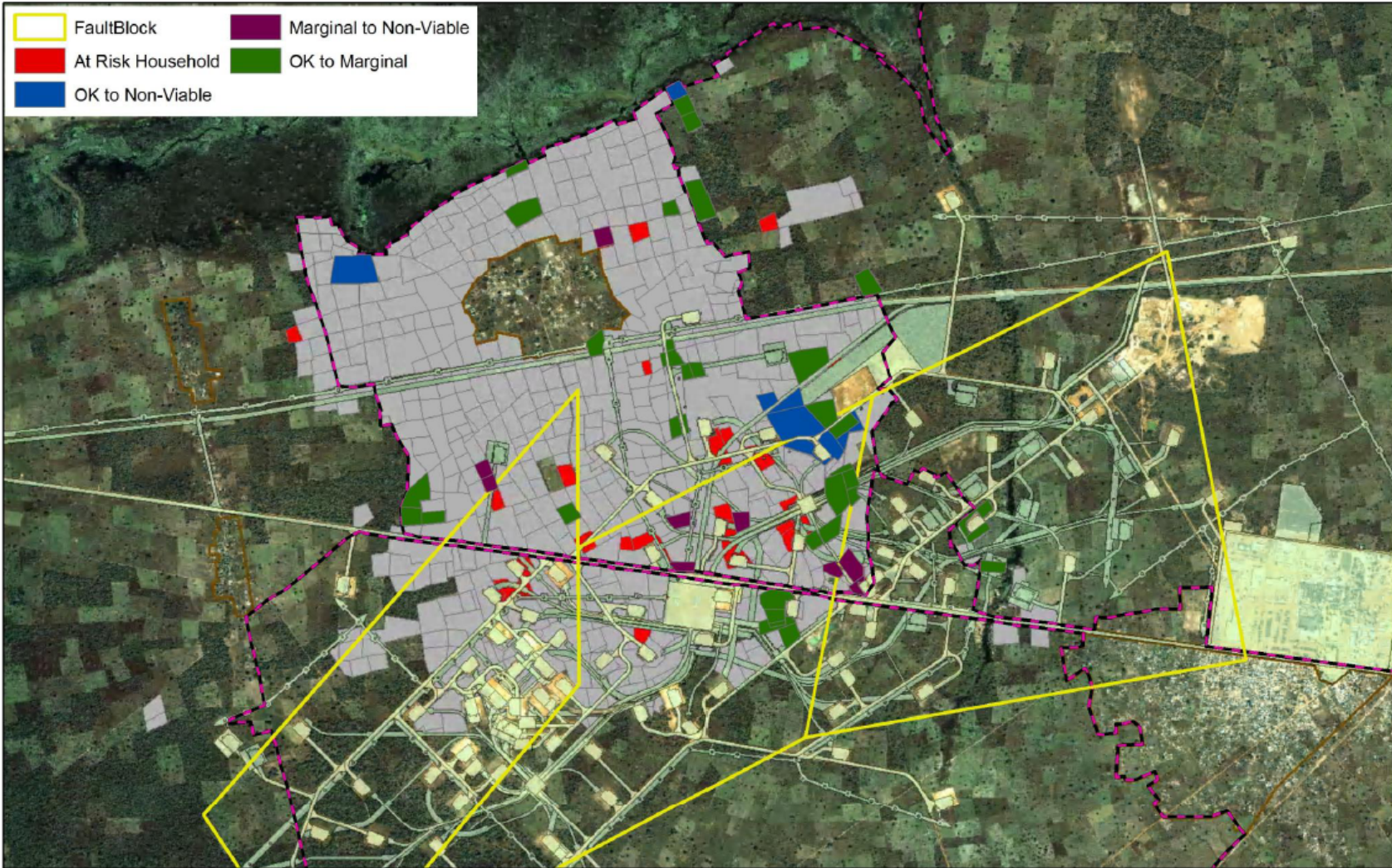
EMP 2008 Annual Individual Report on Vulnerability



ANNEX 3

Village Maps

Danmadjia



Resettlement Eligibility Factor

- ≤ 0.67 Corde/Dependant
- 0.68 - 1.00 Corde/Dependant
- 1.01 - 2.50 Corde/Dependant
- >2.50 Corde/Dependant
- Fallow Land
- Land Cultivated (Field) or Owned (Fallow) by Outsiders
- Protected Site
- Permanent/Not Returned Facilities

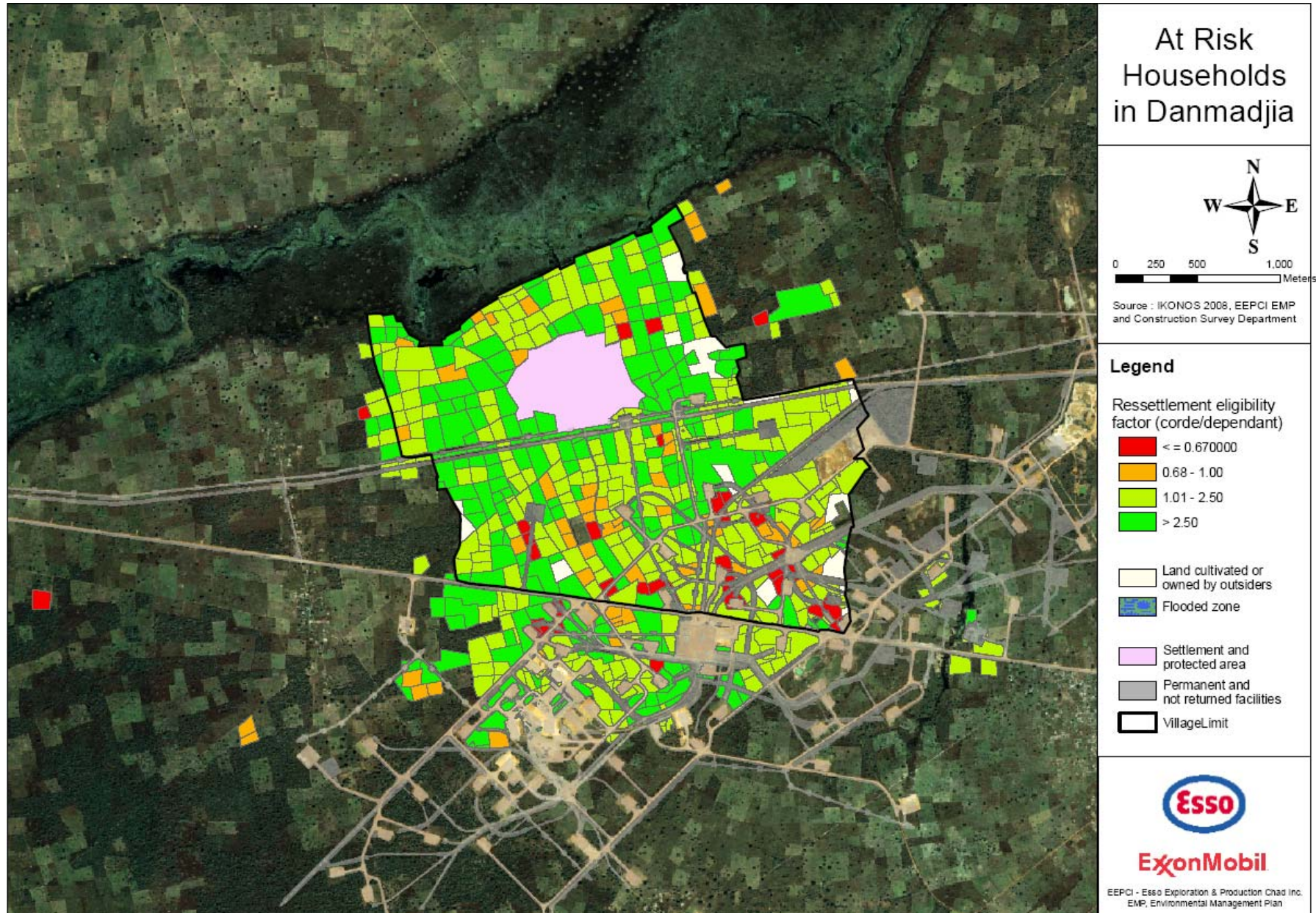
- House
- Settlement
- Village Boundaries
- Fault Blocks

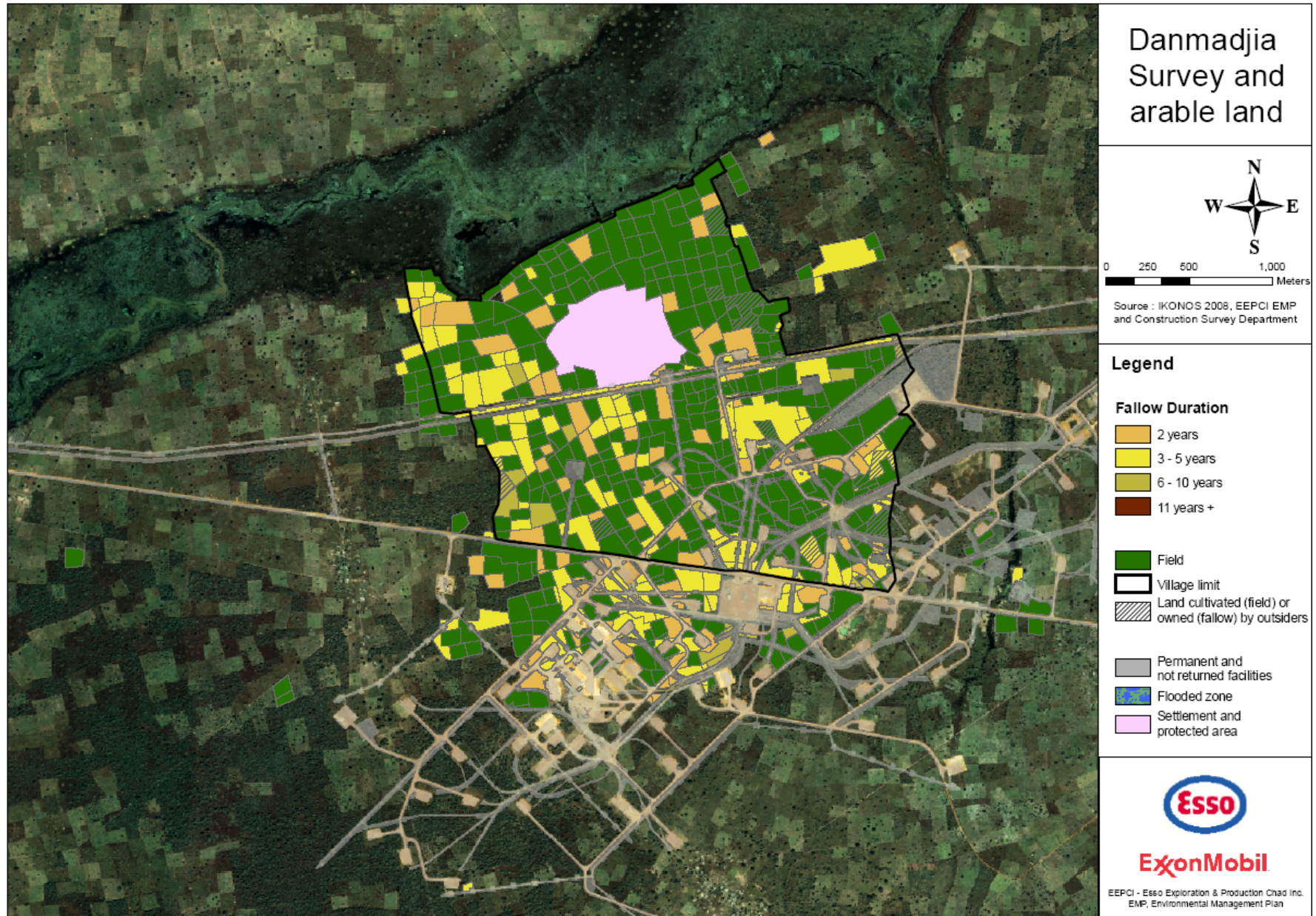
13 Red flagged households from which
11 are project's affected households



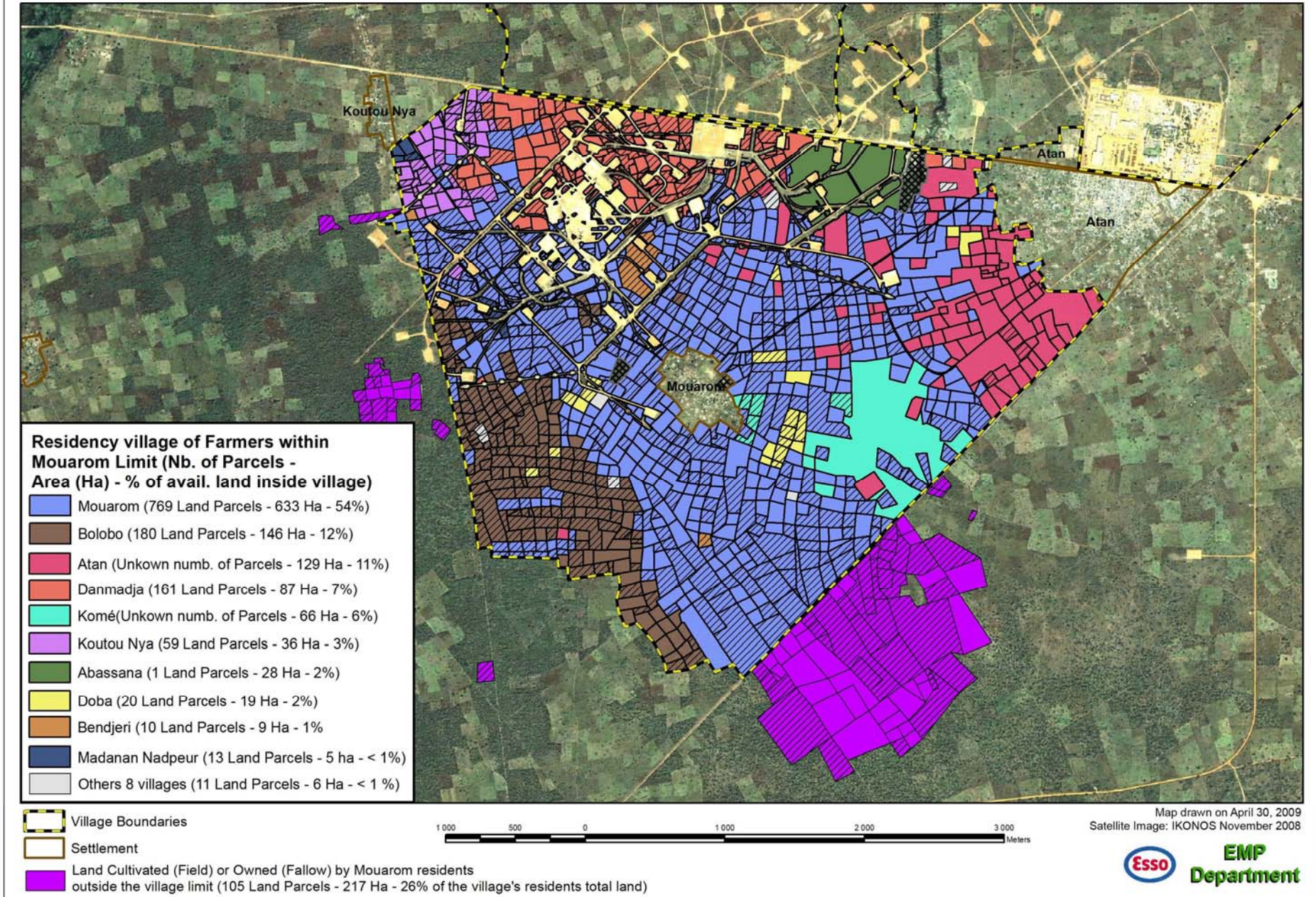
Map drawn on April 30, 2009
Satellite Image: IKONOS November 2008

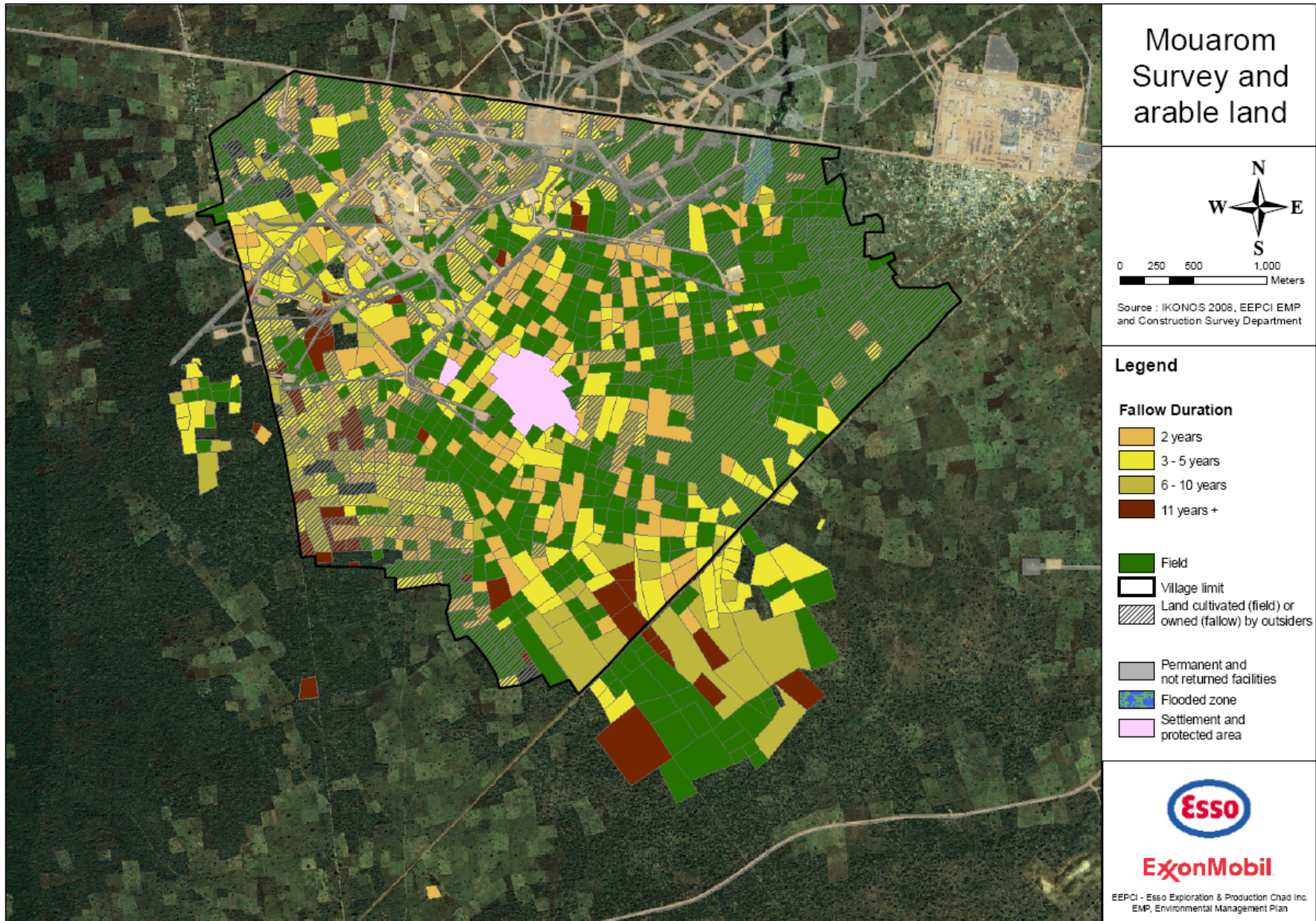




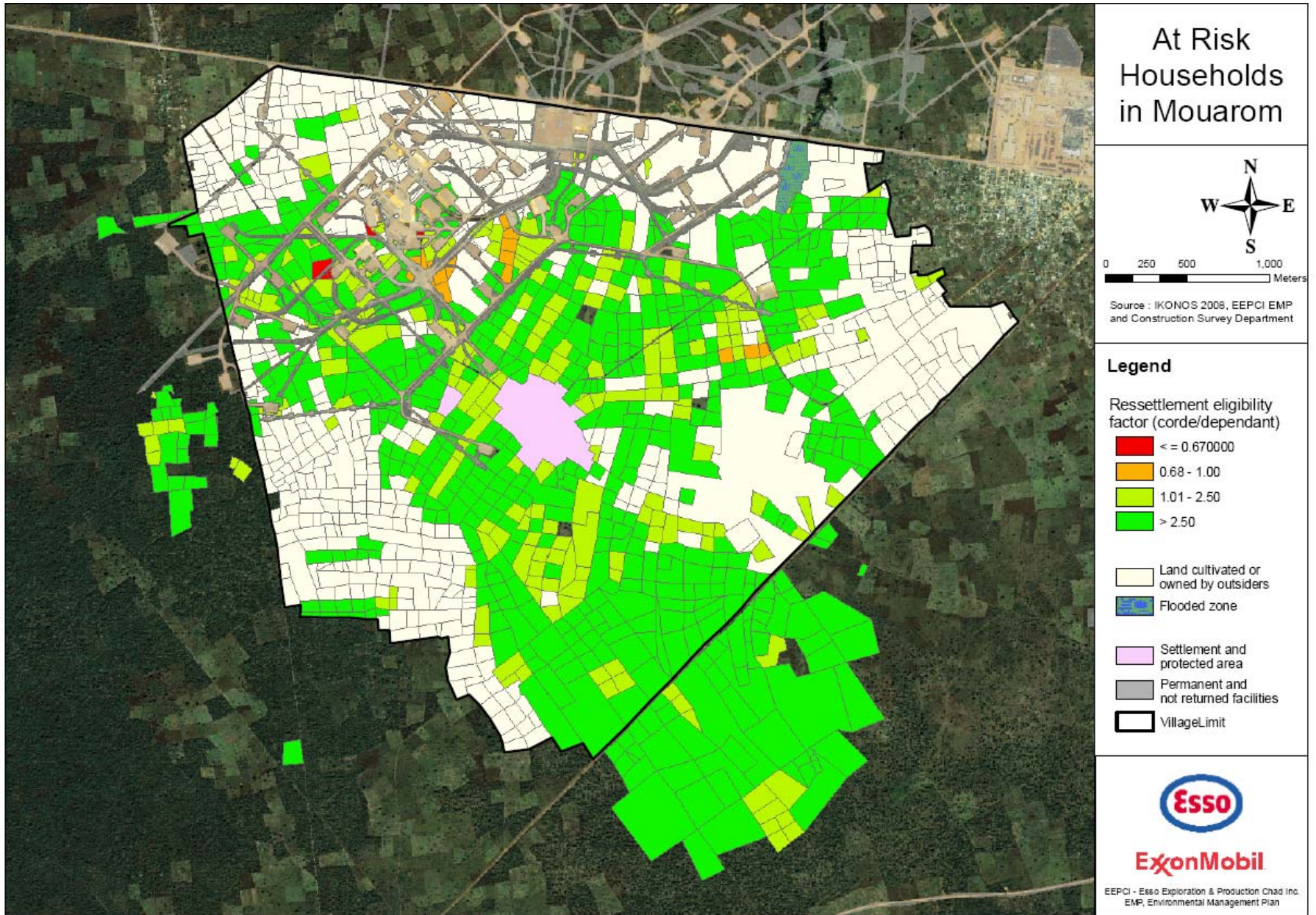


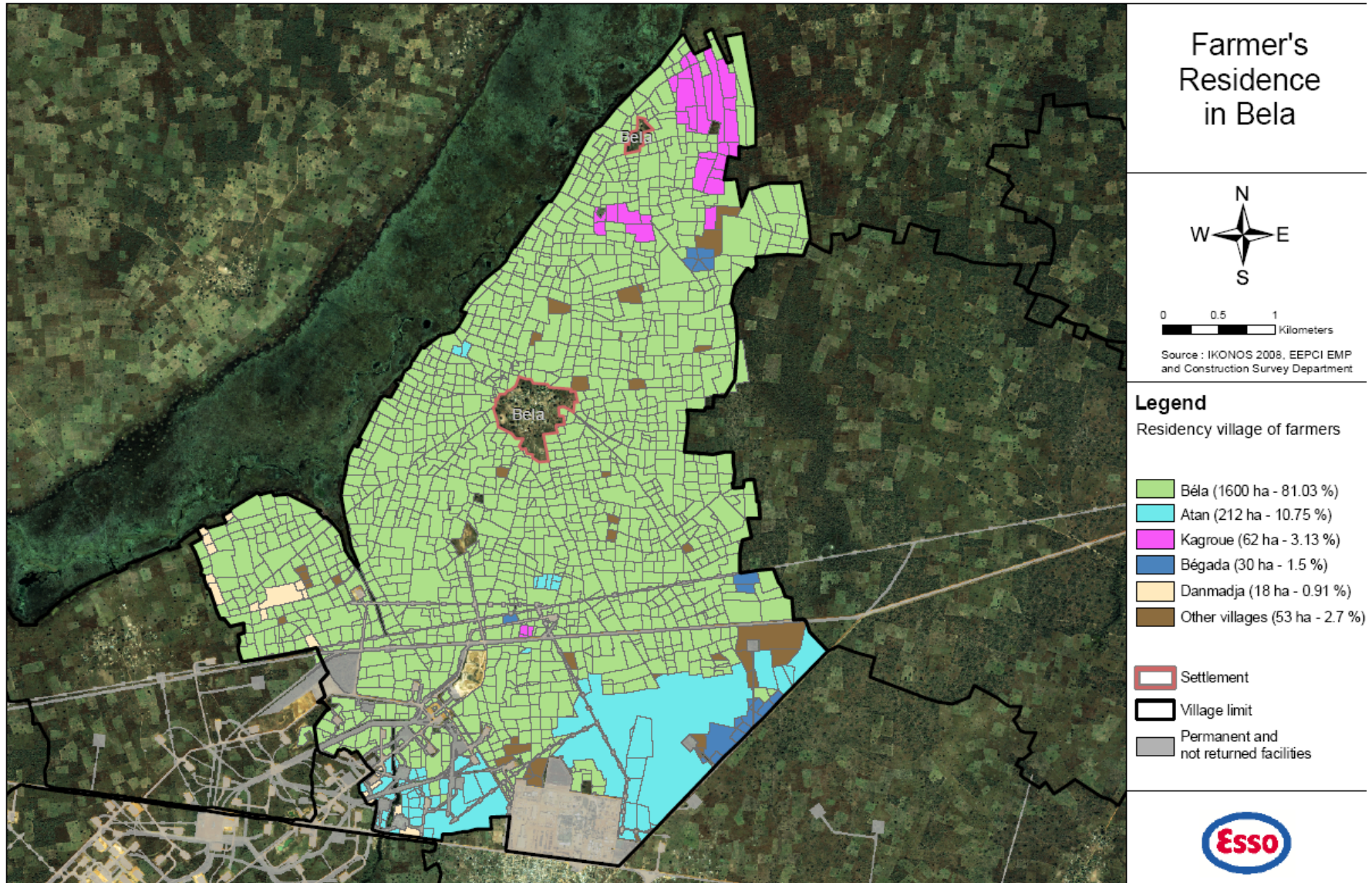
Farmer's Residence in Village of Mouarom





EMP 2008 Annual Individual Report on Vulnerability





Date : 2010-02-09

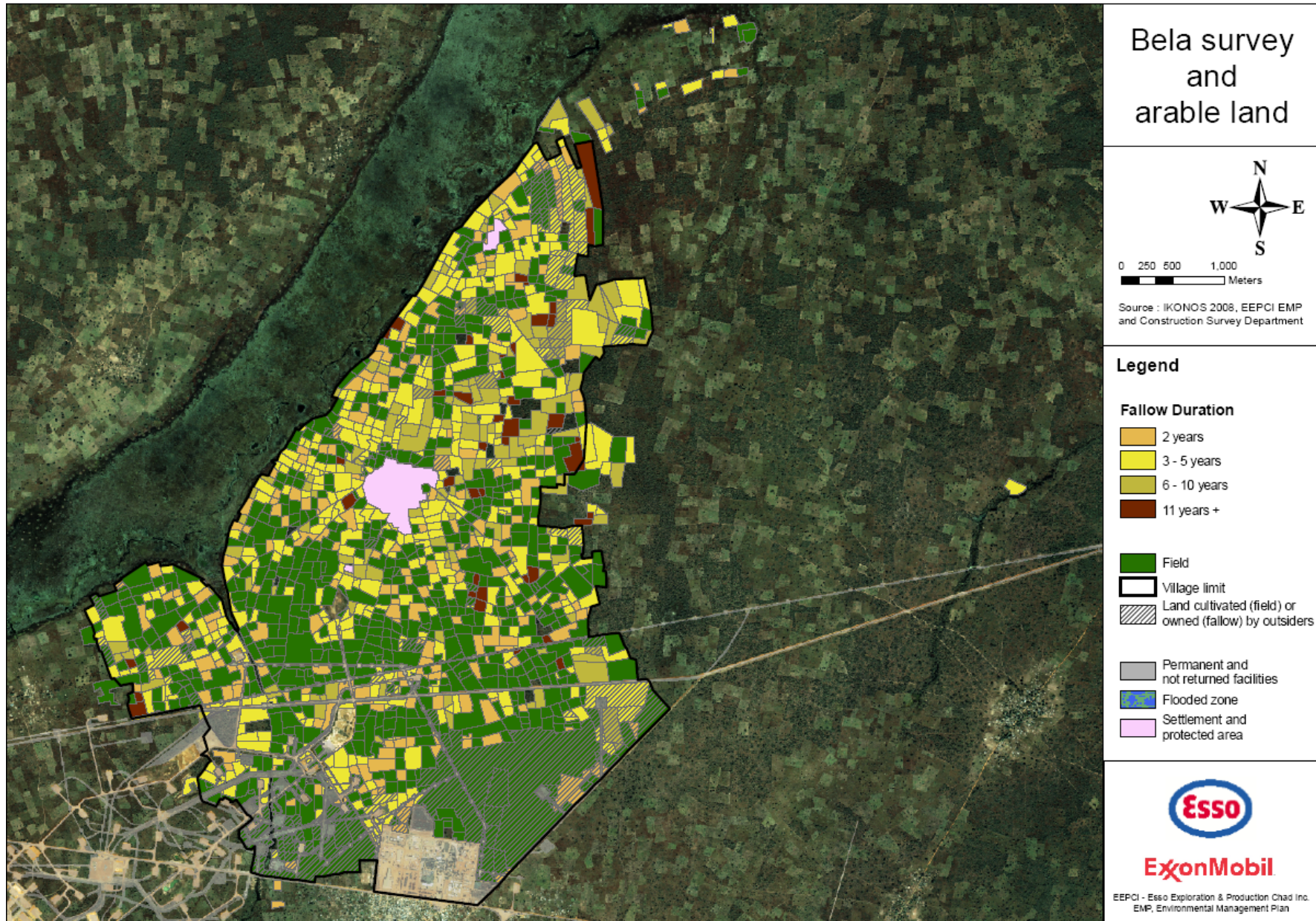
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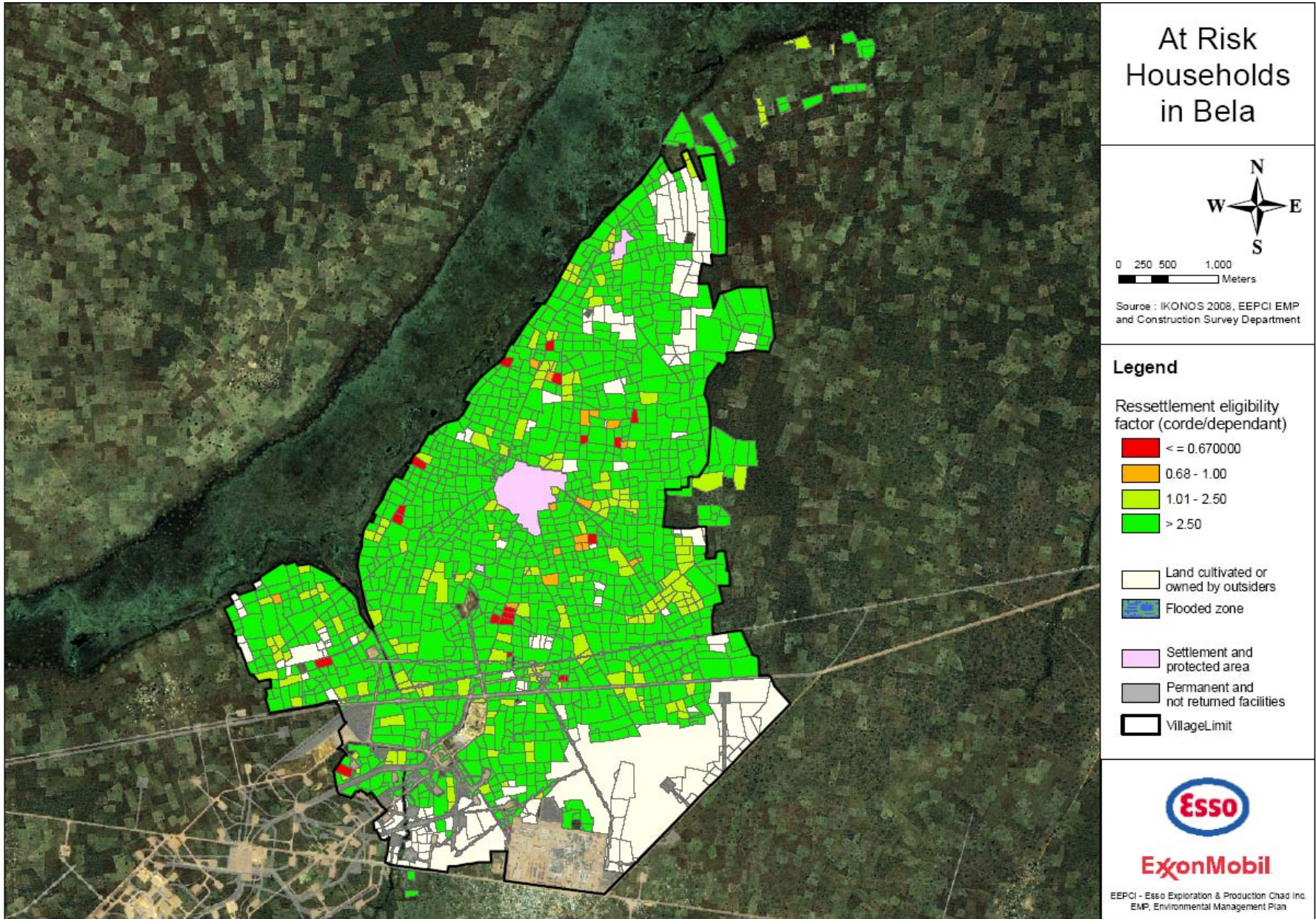
Map : Bela Farmer's Residence

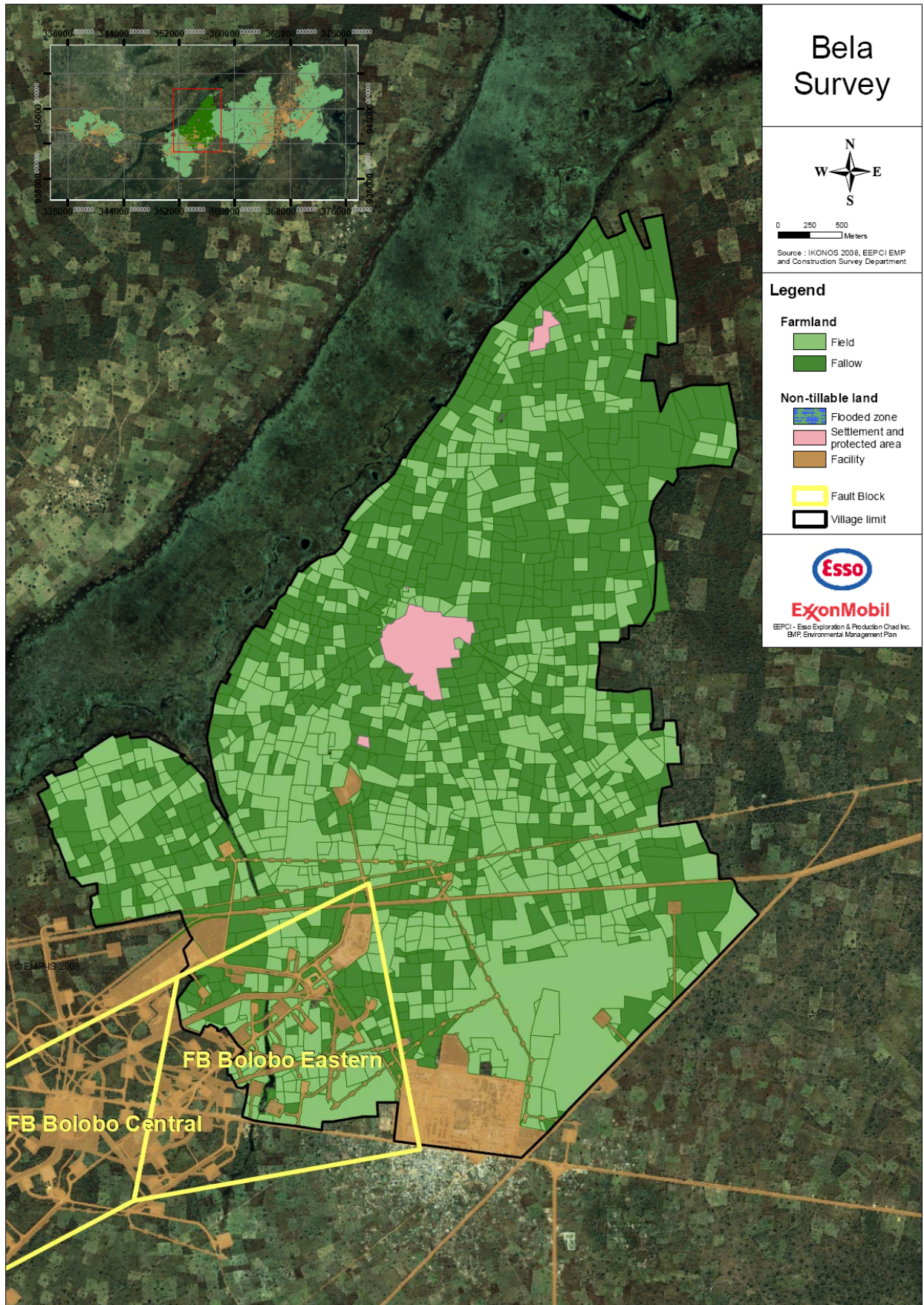


ExxonMobil

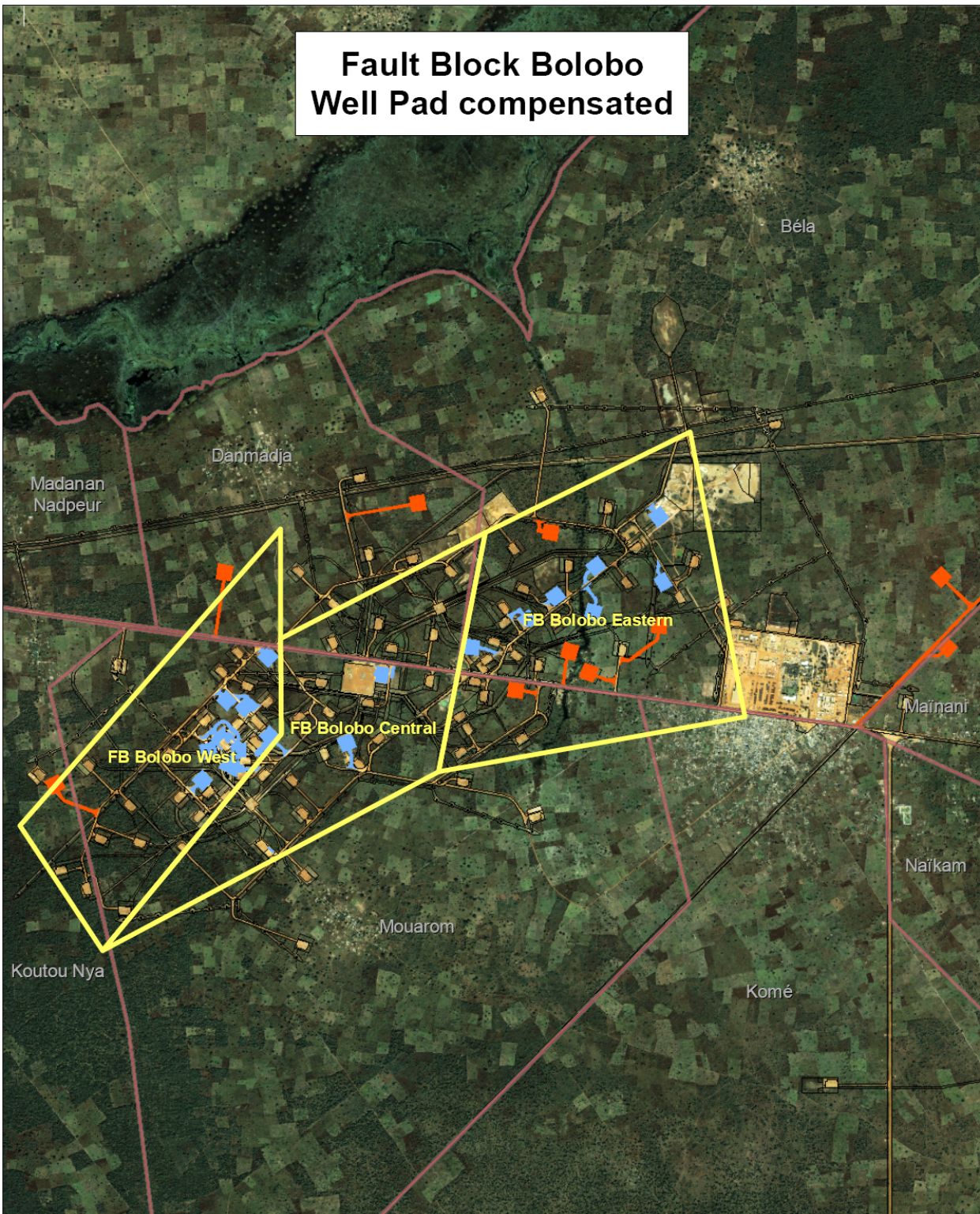
EEP/CI - Esso Exploration & Production Chad Inc.
EMP, Environmental Management Plan







Fault Block Bolobo Well Pad compensated

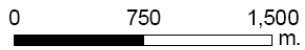


Legend

- Well Pad compensated since May 01, 2009
- Well Pad compensated between May 01, 2008 and April 30, 2009
- Facility
- Fault block
- Village limit



Source : EEP/CI EMP and Construction Survey Department, IKONOS 2008



ExxonMobil

EEPCI - Esso Exploration & Production Chad Inc.
EMP, Environmental Management Plan