Evaluating the impact of a targeted land distribution program: Evidence from Vietnam

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Abstract

Between 2003 and 2007, under the auspices of Programs 132 and 134, the government of Vietnam transferred approximately 21,000 Hectares of land to 43,000 minority households in the Central Highlands region. The programs specified relatively sharp eligibility criteria: Households with less than one hectare of land were eligible for a "top-up" to this threshold. The primary purpose of our project was to evaluate the implementation of these programs, and to assess the impact of this "treatment" on the welfare of ethnic minority households. To do so, we draw on a household-level survey that we carried out in the Central Highlands at the end of 2007. Our primary sample is a panel of households that were also surveyed in 2002 as part of the VHLSS. These data provide a useful baseline for our analysis. Altogether, our survey includes a panel of 1128 households, including 837 ethnic minority households. Our key findings are that 1) Programs 132 and 134 were not implemented as designed. One major constraint appears to be the availability of land for redistribution. In Kontum province, where land is more plentiful, we estimate relatively high treatment rates. Nowhere, however, do we estimate a link between predicted eligibility and *ex post* program participation; 2) A corollary of the weak link between eligibility and treatment is that benefits of the land program did not reach the poorest households, but went to middle and upper-income households; 3) In Kontum, we estimate that the land program provided benefits to households in line with what one would predict given the local productivity of land. Outside Kontum, we found no detectable benefits of land redistribution. Perhaps this is because it is too early to estimate the full impact, or alternatively, the program was too small relative to other changes occurring in the Central Highlands during this time period.

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1. Introduction

In 2001, and then again in 2004, Central Highlands' provinces were disrupted by protests by ethnic minority. There have been numerous assessments in the press, by NGOs as well as by academics of the complex economic, political and social forces underlying the unrest. Issues of religious freedom often come up, but at the core appear to be economic factors, especially those related to land, that have been playing out for several decades. Disruption of ethnic minorities' customary land rights and traditional forms of agriculture following the end of the Vietnam War in 1975; waves of migration into the region by Kinh and other ethnic minority households, accompanied by resettlement of ethnic minority within the region; and commodity boom-bust cycles beginning in the mid-1990s, have all contributed to perceptions of the growing economic marginalization of ethnic minority households in the region, and a widening gap with the Kinh in the region.[1]

To help address these concerns, in 2002 the Central Government of Vietnam implemented Program 132, which was designed to redistribute farmland to land-scarce ethnic minority households in the Central Highlands. This was complemented in 2004 by Program 134, which extended coverage to ethnic minorities outside the region, and added support for housing and access to water to the original farmland distribution. These highly targeted programs must be seen in the context of nationwide poverty alleviation efforts for all of Vietnam, including Program 135.

There have been a number of "official" assessments of Programs 132 and 134 that draw on a combination of commune, district and provincial-level reports. Of these, MARD (2006) is probably the most comprehensive. These reports paint a mixed picture. Overall, upwards of two-thirds of eligible households reportedly received land; however, eligibility is not explicitly defined. Moreover, there is significant heterogeneity across provinces in program implementation. In general, a lack of land for redistribution to ethnic minority households appears to be the main constraint. Potential sources include land under the management of state forest enterprises, land contracted out by state forests to individual households, unused land that can be reclaimed, and land purchased by the state from "land-rich" households.

This study is designed to complement these earlier studies. New household-level data collected as part of this project allow us to: 1) Independently estimate potential household

[1] On the economic welfare of the ethnic minority in Vietnam more generally, see van de Walle and Gunewadena (2000), and Baulch et. al. (2007).

eligibility for these programs; 2) Examine "treatment," i.e. receipt of program land, by both eligible and ineligible households; and 3) Assess the economic the impact of treatment on those households that actually receive land. Earlier studies have primarily focused on estimating the overall percentage of households that received land, and not on impact *per se*.

This report is organized as follows. In section 2, we draw on the 2002 VHLSS to provide context for the new policies. We first compare households in the Central Highlands to those outside, and then within the Central Highlands, examine the differences in endowments, expenditures and incomes between the Kinh and the ethnic minority. In section 3, we describe our planned evaluation strategy, and the sampling strategy for the survey. In section 4 we draw on the new household data to examine potential eligibility for 132 and 134 and household treatment. This is followed by an assessment of the impact of treatment in Section 5. As part of this assessment, we independently examine the economic "value" of land to households. In section 6, we contrast implementation of the farmland elements of Programs 132 and 134 with Program 134 support for housing and water. Section 7 concludes.

2. Background

We begin by drawing on the 2002 VHLSS to compare the endowments and welfare of Kinh and minority households in the rural Central Highlands with each other, and with rural households living outside the region. Results are shown in Table 1. Altogether, the 2002 VHLSS provides information for 3,000 households in the Central Highlands, and 54,000 outside. We report summary information on landholdings, household demographics and expenditure and incomes.

Several key observations emerge from this comparison. First, land is significantly more abundant in the Central Highlands than outside. However, per capita incomes and expenditure in the region still lag significantly levels in the rest of country. This largely reflects the wide gap in incomes between minority and non-minority households within the Central Highlands, and the fact that ethnic minority make up more than a third of the population. In other words, poverty in the Central Highlands is not so much a "regional" problem, as it is an ethnic minority problem.

On average, households in the Central Highlands possessed 1.22 hectares of agricultural land (annual plus perennial) compared to only 0.48 hectares for households outside. Much of the difference is reflected in perennial land, with slightly smaller differences in annual land. Since the mid-1990s, there has been a significant shift in the region out of cereals and into perennial

crops (Benjamin et. al. 2008). Differences in household holdings of forestry land between the Central Highlands and elsewhere are marginal. Within the Central Highlands, ethnic minority households report slightly more agricultural land per household than the Kinh, which is reinforced by larger forestry holdings. Note however that this is driven by minority holdings of annual land, which more than offset their small holdings of perennial land compared to the Kinh. The larger farms for the minorities overstate any land "advantage" once we allow for differences in land quality. Pure landlessness, however, is not a major concern in the Central Highlands. Whether household land is sufficient to support minority livelihoods is a separate matter. Furthermore, larger household size amongst the ethnic minority largely eliminates the differences in per capita household land.

Land abundance does not translate into higher household incomes or expenditure in the Central Highlands. The reason for this is primarily an ethnic minority phenomenon. In 2002 per capita annual incomes amongst the ethnic minority were only sixty percent of the Kinh, 2.92 million VND versus 5.056 VND.[2] With ethnic minorities making up 43 percent of the population, this pulled the regional average well below the national average. Per capita incomes among the Kinh living in the Central Highlands were only modestly lower than those households outside the region. Per capita expenditure differences mirror those for income, while estimated levels of inequality suggest that there is slightly less dispersion of income among the minorities than for the Kinh.

Human capital, as much as land, likely figures prominently in any explanation of income gaps between Kinh and minority households. Calculated over the working-age population (15 and older), average highest household educational attainment in the Central Highlands was slightly lower for both males and females compared to individuals outside. Similar to what we observed in incomes however, most of this is comes from the astonishingly low levels of educational attainment of the ethnic minority relative to the Kinh; Educational attainment for the Kinh in the region was actually slightly higher than the average outside the region. Among minorities, adult women average less than three years of formal education, compared to 6.5 years for Kinh women, while minority men have 3.8 years of schooling, compared to 7.6 years for male Kinh.

A complementary picture of the rural population and landholdings in the Central Highlands is gained by utilizing the 2001 Agricultural Census. Overall, the Agricultural Census for 2001 and the much smaller VHLSS for 2002 are highly consistent with each other, and add

[2] In 2002, $1US was equal to 17,500 VND.

credibility to our use of the VHLSS in the assessment that follows. In Table 2, we provide a breakdown of landholdings by provinces, and for Kinh versus ethnic minority households that parallels our discussion above (and to follow). The four provinces of Kontum, Gia Lai, Dak Lak, and Lam Dong differ significantly in size, with the population of Kontum the smallest, less than one-sixth the size of Dak Lak the largest. The concentration of ethnic minority households also differs, with nearly two-thirds of the population in Kontum made up of ethnic minority; in contrast, ethnic minorities only make up a quarter of the population in Lam Dong. [3]

In terms of average agricultural land per household, the differences between provinces, as well as between Kinh and ethnic minority within each province are relatively small in the Census data. Per household holdings of agricultural land in Gia Lai are the largest (1.17 hectares) followed by Kontum (1.10), Dak Lak (1.03) and Lam Dong (0.95).[4] Furthermore, the distributions of agricultural landholdings amongst households within each province are also fairly similar among the four provinces. For example, in each province, between 25 and 30 percent of all households have more than a hectare of agricultural land.

Much larger differences among provinces appear with respect to the percentage of land in perennials, and the amount of land ethnic minority households have in perennials compared to the Kinh. In Kontum, annual land makes up 71.1 percent of total agricultural land, compared to 34.4 and 23.2 percent in Dak Lak and Lam Dong, respectively. Moreover, the gap between ethnic minority and Kinh households are much larger in Kontum compared to Lam Dong, where ethnic minority hold nearly as much perennial land, and two and half times as much annual land as do the Kinh households.

3. Planned Evaluation Strategy

3.1 Relevant Issues of Program Evaluation

In the appendix, we reproduce Decision 132, which was announced in the fall of 2002. Article 2 of Decision 132 suggests a straightforward evaluation strategy for assessing the impact of the program: "The minimum distribution of agricultural land for each household is 1 hectare of terrace land or 0.5 hectare of paddy land (single crop)…" If implemented to the letter, the policy specified well-defined eligibility criteria, and slightly less well-defined but simple program

[3] It may be only coincidental, but later we show that implementation is positively correlated with the share of the ethnic minority in the total population.

[4] Over all four provinces, average per household holdings is 1.08 hectares, which is modestly lower than the 1.22 hectare average calculated using the 2002 VHLSS.

parameters: For households in the Central Highlands, where paddy is less common, households with less than a hectare of land in 2002 should receive a land transfer to bring them to this threshold.

To estimate the impact of the program, i.e., the benefit a household received from the extra land, we would like:

- An estimate of household activities and outcomes in the absence of "treatment";
- An estimate of household activities and outcomes with "treatment."

Of course, as is standard in evaluating any program, we do not observe the "treated" and "untreated" states for any particular household. Instead, we observe treated and untreated households. The question, as usual, is whether untreated households provide a good counterfactual for what would have happened to the treated households if they had not been treated.

Setting aside the program evaluation problem, as a purely descriptive exercise it is worth knowing how outcomes evolved for treated and untreated households. We can then assess whether various strategies comparing differences between treated and untreated households are informative as to the causal effect of the policy. The centerpiece of our empirical work thus requires:

- An estimate of household activities and outcomes *before* the policy was instituted;
- An estimate of household activities and outcomes *after* the policy was instituted, and the household had received its land (i.e., *treatment*).

Such data, at a minimum allows for "before and after" comparisons, and yields one estimate of the treatment effect. For example, we could estimate how much income or indicators of welfare changed before and after the program, and compare the changes for treated and untreated groups. As is well-known, however, "before and after" evaluations have important limitations. Especially in a fast changing and growing economy, we expect incomes and welfare to improve, even without the program. Thus, in order to estimate a pure "treatment effect," we need to know how minority households' incomes evolve in the absence of treatment. In other words, we need a control group – or several potential control groups – in order to estimate the

counter-factual of how treated households would look if they had not been treated. The policy suggests a number of potential comparison/control groups:

- Ineligible minority households within the same commune. Households with just over one hectare of land should be very similar to those with just under one hectare of land, yet only those below the threshold would receive the land transfer. In the spirit of "regression discontinuity" design strategies, we could compare outcomes of the "eligible" group to almost identical households in the "ineligible" group, both before and after the program was implemented. This was our ideal identification strategy, as eligibility for the transfer (near the threshold) should be unrelated to potential outcomes, and the benefits of potential treatment. On the downside, its implementation requires strict adherence to the program implementation around these boundaries. Even in the best of cases, however, this strategy would require a large sample of households around the one hectare limit.
- Non-minority households that were ineligible for the land transfer. To the extent that non-minority (Kinh) households are similar to minority households (e.g., Kinh households with small farms living as neighbors to the minority households), we might expect their income growth before and after the policy to provide a benchmark of changes in outcomes in the absence of the policy. On the other hand, if Kinh households are engaged in different kinds of farming (e.g., perennials), or have different sets of agricultural human capital, then they will be a poor control group.
- Treated and untreated households within the same commune could also be compared. In fact, this is the most obvious way to construct control groups: compare two identical households in the same commune, both with 0.5 hectares of land, but only one of which received treatment. Unfortunately, this strategy requires that treatment status is exogenous (independent of potential outcomes). If land was only distributed to the most promising (or least promising) candidates, then untreated would not be an informative control group. However, if treatment status was "random" in the sense that differences in potential income from treatment did not generate differences in treatment status, then this strategy has the benefit that households within the same commune are otherwise most similar.
- Treated and untreated households across communes. Some communes will have spare land to distribute, others will not. If the communes are otherwise identical to each other, we can compare the outcomes of near-landless minority households in those communes that

implemented 132, to those households in communes that did not implement 132. Of course, communes with "spare" land may be different than those without spare land. For example, land may be worth significantly less in communes with spare land, so that the impact of the land transfer is under-estimated. Land-rich and Land-poor communes may be sufficiently different that differences in *ex- post* treatment rates yield a poor experiment.

- Minority households outside the Central Highlands. Another candidate control group is minority households in surrounding provinces outside the Central Highlands, as they were not eligible for Program 132. One advantage of such a control group is that they would not be affected by "spillovers" from treated households. For example, high levels of land re-distribution may affect the control group in heavily-affected communes. On the downside, households in the other provinces were ultimately eligible for the smaller transfers from 134, which means that they would not be a perfect counterfactual. Furthermore, if there are big differences in outcomes across provinces, then adding more provinces does little to identify the effect of a program in the Central Highlands.

Because each control group had its pro's and con's, our strategy in implementing the "Central Highlands Vietnam Living Standards Survey" (CHVLSS) was to collect data on all possible control groups, in order to conduct robustness checks on our evaluation. Our starting point was the baseline survey: the 2002 VHLSS. We decided to survey as many potentially treated households as possible (within budget), and to collect data on the best possible set of controls (minority households, inside and outside the Central Highlands). The VHLSS survey instrument was easily tailored to allow us to track changes in land between the base year (2002), and the most recent post-treatment year (2007), as well as a long list of potential outcomes (income, consumption, etc.).

3.2 Sampling Strategy for the CHVLSS

The 2002 VHLSS provides data on 3000 rural households in the Central Highlands drawn from 120 communes, or 25 per household. Our objective was to pick a subset of these communes, 50 in total, and in turn 1250 households, for resurvey in 2007. Several criteria motivated our selection of communes: the percentage of households that were ethnic minority; the percentage of minority households that were potentially eligible for treatment by 132, and the number of households that were asked both the income and expenditure modules of the survey.

Our selection of communes was skewed towards maximizing the number of potentially "treated" ethnic minority households, as well as households for which both income and expenditure data were originally collected. The expenditure data provide an expanded set of outcomes to compare. There also appears to be a systematic bias in the income estimates of those households that were only asked the income modules (McCaig, 2008).

For administrative reasons, we also excluded all communes that in 2002 were in Dak Lak, but became part of Dak Nak province after 2003. The resulting districts that we sampled are shown in Figure 1. Relative to their share of the rural population in the Central Highlands, we over-sampled in Kon Tum and Gia Lai, and under-sampled in Dak Lak and Lam Dong. In addition, we also surveyed 400 households in 16 communes in two neighboring provinces, Ninh Thuan and Quang Ngai, but in this paper, we do not utilize these data.[5]

For households, we adapted the full VHLSS questionnaire, with additional modules on Program 132 and 134 program participation. Surveys were also conducted at both the commune and district level, with modules added relating to 132 and 134 implementation.

3.3 Comparisons across CHVLSS sampled and non-sampled households

In Table 3, we explore differences between households in our 50 Central Highlands communes to the broader 2002 VHLSS data. We focus on a comparison of those 1128 households that we were able to track perfectly (i.e., "panel" households), as opposed to the "replacement" households used to top the sample to 1250.[6] Reflecting our sampling strategy, among all households, our sample is tilted heavily towards minorities (74 percent of sampled households versus 24 percent of non-sampled households). Second, we compare the minority households in communes sampled in 2007 versus those in non-sampled communes. Among minorities, our sample has less total land, especially less annual land. As a result – and as intended -- our sample has a much higher predicted eligibility rate for 132 or 134. The remaining

[5] Following our strategy in the Central Highlands, we selected communes with high minority population concentrations. These tended to be communes located near the borders with the Central Highlands's provinces.

[6] In the course of our resurvey, we were not able to track down all of the households that were originally surveyed in 2002, and we were not able to construct a "perfect" panel. The attrition was 122 households, or 10 percent of the original sample. We compared the 2002 attributes of our panel households (1128) with those of the households that we lose to attrition (122). Not conditioning on commune, we lose slightly more non-minorities, households with less annual land, and smaller households with slightly higher incomes. Conditioning on commune, there are no significant differences between the panel households, and the attrited ones (within the sample communes). This suggests that our panel households should provide an unbiased picture of the changes between 2002 and 2007 (conditional on the commune being re-sampled).

differences between our surveyed households and those we did not survey are relatively marginal. Notably, the minorities in our sample have similar incomes to those we did not sample.

Our conclusions are therefore based on a specific sub-sample of ethnic minority households in the Central Highlands. They are designed to be representative of minority households with small land endowments (pre-program), not the Central Highlands more generally.

4. Program Participation

4.1 Land and Income Comparisons for the Panel

The objective of Program 132, and to a slightly less extent 134, was to redress differences in land endowments between ethnic minority and Kinh households in the Central Highlands through allocation of land to the former. Thus, it is useful to examine differences in landholdings between the two types of households before the policies were implemented, which we report in Table 4. The four Central Highland provinces we examine are not identical in this regard. Indeed, for reasons that will soon become clear, we separate results for the Central Highlands into (1) Kontum; and (2) CH Outside Kontum. Altogether, in the CHVLSS we have data on 231 households in Kontum, of which 208 are minority, and 896 outside Kontum, of which 629 are minority.

We report summary measures relating to both the mean and distribution of landholdings for annual, perennial, and annual *plus* perennial land for minority and non-minority households. The land indicators in the surveys do not perfectly line up with the categories in the policy (annual and perennial land in the survey; terrace versus paddy land in the policy document). The policy was directed primarily at annual land, though as land is clearly fungible, and perennials are important in the Central Highlands, it makes sense to explore the sensitivity of conclusions to various definitions of land holdings. It is also unlikely that households with significant holdings of perennial, but not annual land, were the intended beneficiaries of the program.

In the case of Kontum, ethnic minority landholdings were significantly smaller than those of their Kinh counterparts. Average total ethnic minority landholdings were 1.14 hectares per households compared to 1.97 for Kinh, or a difference of nearly 75 percent.[7] Minority households

[7] These differences, which are largely coming off of annual land, are larger than those observed in the Census Data. It is important to keep in mind here the relatively small number of Kinh households in Kontum in our sample (23 in total).

owned less of both types of land, with their holdings of perennial land only 0.07 hectares compared to 0.55 hectares of non-ethnic minority. We also observe 12 percent of ethnic minority households having annual landholdings less than 0.5 hectares, and an additional 40 percent with landholdings between 0.5 and 1.0 hectares. In total, 52.4 percent of all ethnic minority households have less than a hectare of annual land. Including perennial land only marginally lowers the percentage, reflecting the small amount of perennial land held. By comparison, only 13 percent of non-ethnic minority households have annual plus perennial land less than a hectare.

A slightly different picture emerges outside Kontum. Ethnic minority households on average have ***more*** land than non-minority, with all of this a product of larger holdings of annual land. Holdings of perennial land are nearly identical (0.47 hectare versus 0.49). There remains a significant percentage of ethnic minorities with annual or total agricultural land holdings less than either 0.5 or 1.0 hectare, but the percentage is typically no higher, and usually lower than we observe for the non-ethnic minority. Overall, 68.9 percent of all non-ethnic minority report landholdings less than a hectare compared to 43.7 percent for ethnic households.

In the bottom half of Table 4, we make similar comparisons with respect to household incomes. Here the differences between Kontum and the three remaining Central Highland provinces are much smaller, with non-ethnic (Kinh) minority households enjoying higher total incomes of roughly 45 percent in both cases.[8] Note however the differences in the sources of this difference. Outside Kontum, income from cropping is nearly identical between the two groups, with higher wage and business income for non-ethnic minority the source of much of the gap. In Kontum, on the other hand, differences in cropping income between the two groups are the source of slightly less than half of the difference, with income from wages and family businesses making up the rest. In all likelihood, differences in access to land underlie the differences in cropping income.

Comparing minorities across provinces, income levels are quite similar, so the distinction between Kontum and the other provinces (in 2002) is not income-based. Nonetheless, the composition of income is different, with minorities in Kontum earning less from cropping, and more from agricultural sidelines, which is likely connected to their greater access to forest land.

Finally, we report the three largest minority groups in each "region." Throughout this report we discuss minorities as a homogeneous group, when in fact there are many different ethnic groups. Of particular note, the ethnic groups in Kontum are different than those in the rest

[8] In per capita terms, the differences are even larger, reflecting differences in average household size.

of the Central Highlands, adding another reason why we separate our discussion for these sub-regions.

4.2 Eligibility and Treatment of 132 and 134

How well does estimated program eligibility line up with actual treatment? Does the program appear to have been implemented according to the letter of the law?

Programs132 and 134 were both designed to redistribute land towards ethnic minority. We have several alternative estimates of eligibility and treatment: Official provincial reports of program implementation, our district and commune level surveys, and our household data. Before turning to the household level data, which will allow us to link treatment to eligibility, we examine the provincial and commune level data, the results from which we report in Table 5.

4.2.1 Province and Commune Level

Each province reported for Program 132 the number of potentially eligible households, the number that were treated, as well as the amount of land that these households received. Provincial reports of treatment rates are presented in Panel A of Table 5 (Table 5A). We do not know the basis on which provinces calculated eligibility, but overall, 28.3 percent of all ethnic households were identified as eligible. There are significant differences across provinces, with the highest percentage of eligible in Kontum followed by Lam Dong. Concerning overall treatment rates (a more precisely defined statistic) Kontum reported the highest percentage of minorities (37.2%) and also a higher percentahe of "eligible" that were treated (81.9%). Neighboring Gia Lai province had the next highest rate of treatment (15.7% of all minority households). In contrast, less than half of eligible households in Dak Nak or Lam Dong received land. Irrespective of province, those households that were treated received (on average) slightly less than half a hectare of land.

In the second two panels of Table 5 we report comparable results from our commune level data, in addition to information on the thresholds that communes report they used for establishing eligiblity. At the outset, it important to keep in mind that our strategy for selecting communes into the sample implies that these estimates will not likely line up with the provincial estimates. Since we selected communes on the basis of potential eligibility, the sign and

magnitude of the bias will depend on how treatment rates are correlated with potential eligibility. In principle, the bias could be either positive or negative, but our hope was to select communes with the greatest extent of treatment.

Out of our 50 communes, 35 report implementing 132, and 39 report implementing either 132 or 134.[9] In Table 5C we see that household eligibility was typically defined in terms of one kind of land, e.g. annual, perennial or unused, but there are few communes that based it on a combination of two. We find significant differences in the thresholds that were used. Kontum appears to have followed the national directives most carefully, with mean eligibility just slightly less than a hectare of annual land. In both Gia Lai and Lam Dong, households typically with land less than 0.3 hectare were deemed eligible, while in Dak Lak, it was two times that. Moreover, in Dak Lak, eligibility was based sometimes on perennial land.

Overall, in Table 5B we see that the percentage of households the communes report receiving land through 132 is slightly smaller than the provincial totals, with the difference even smaller if we combine treatment through 132 or 134. These estimates are based on all of the communes that we surveyed, and not just those that report implementing 132 or 134. For Kontum, we see that communes report that 38.1% of minority households received land through 132 or 134, lining up remarkably well with the provincial reports. The communes in the other provinces also show similar magnitudes of program treatment, confirming the significant differences in treatment rates between Kontum and elsewhere.

In Table 6, we also draw on the commune level data to calculate the type and source of land redistributed to households. In Kontum, it is primarily annual land that has been transferred from state farms or plantation, or been reclaimed. The average amount of land redistributed per household is 0.45 hectares, which is identical to the provincial based estimate. Outside Kontum, annual and perennial land transferred from state farms and plantations are slightly less important, while land obtained by the state from other households (with compensation) makes up nearly a third. The commune level data also imply that on average 0.30 hectares per household were redistributed, which is slightly lower than the provincial level data suggests outside Kontum.

In summary, the province and commune level data reveal significant heterogeneity in treatment rates. This heterogeneity likely comes from a number of sources including: 1) Variation

[9] All communes in Kontum resurveyed report implementing 132. This was followed by 12 out of 15 in Gia Lai, 12 out of 17 in Dak Lak, and only 1 out of 8 in Lam Dong.

in the cut-offs used for determining eligibility; 2) Variation in the number of eligible households; and 3) Most importantly, variation in available land, and budget for project implementation.

4.2.2 Household Eligibility

We do not actually know whether a particular household was deemed eligible for the program. However, we do observe land holdings in 2002, which should be strongly correlated with eligibility. Strictly speaking, our estimates of "eligibility" are for "potential eligibility." For expositional ease, we will mostly dispense with the "potential" qualifier. In Table 4, we reported the proportion of households falling into three basic landholdings groups: 0 to 0.5 hectare, 0.5 to 1.0 hectare and more than 1.0 hectare. The VHLSS land data do not map perfectly into the eligibility criteria spelled out in the 132 and 134 documents (which were based on "Terrace Land.") To identify potentially eligible households, we used varying measures of land holdings: annual land alone, or (our preferred measure) the total agricultural land (annual plus perennial). In the case of Kontum, 12 percent of all minority households had landholdings less than half a hectare of annual land in 2002, with an additional 40 percent having land between 0.5 and 1.0 hectares. Slightly less than half had more than a hectare. Adding perennial land does not alter the basic picture, reflecting the fact that perennial landholdings were relatively small among ethnic minority in Kontum. Taken together, we would predict that about half of the households in Kontum were eligible for the program (by either land measure).

Outside Kontum, a significantly higher percentage of households, namely, 42 percent, had less than half a hectare of annual land, but this was offset by larger holdings of perennial land for those households at the bottom of the distribution for annual land. Outside Kontum, we would thus expect annual land to be a poor proxy for eligibility, as many households had perennial land instead. Using total agricultural land, 18 percent of all households had less than half a hectare of land, with an additional 26 percent having between 0.5 and 1.0 hectares. If annual land was the sole basis of eligibility, a significantly higher percentage of households outside Kontum would have been eligible, however if annual *plus* perennial land are used, the differences are much smaller. Only 44 percent of minority households had less than a hectare of total land, and given the relative importance of perennial land here, one can imagine that the target population was even a smaller share. Even if implemented identically, we would expect lower treatment rates than in Kontum, as eligibility rates are lower.

4.2.3 Household Treatment Status

In our household survey, we directly asked households whether they received land from Programs 132 or 134. In Table 7, we use these data to report household treatment rates and document the key relationship between potential household eligibility—defined here on the basis of annual plus perennial land—and treatment. This is important for two reasons. First, it has independent value as an input in assessing how well the program was executed: Did implementation follow the directives as originally specified in the policy document? Second, it allows us to evaluate the feasibility of using program eligibility as a way to cut the data in creating treatment and control groups for assessing program impact. For example, if we are concerned that treatment status was endogenous, we might be able to use program eligibility as a more "exogenous" indicator of treatment status. In this table, we only report results for minority households, as (consistent with the program parameters) we do not observe Kinh households reporting having received land through the programs.

While program eligibility status is fuzzy for reasons described above, unfortunately, even treatment status is potentially ambiguous, as households may not be fully aware of their own treatment status (given the number of programs, and strong links between the commune and land allocation). We therefore provide information on "treatment" by initial landholdings using several alternative definitions of treatment:

- "**Treat 1**" A pure estimate of land received from the main Program 132;
- "**Treat 2**" Allowing for some confusion between the two main land programs (132 or 134); and
- "**Treat 3**" A broader measure that also includes new land that households report they reclaimed since 2002.

"Treat 3" is the most liberal estimate of treatment, and allows for the possibility that households may not have known the channel by which they received the additional land. Recall from the commune-level data in Table 6 that reclaimed land represented the source of a quarter of all land redistributed to households.[10]

[10] The household level data on land received through 132 and 134 also reveals the important role of reclaimed land.

To begin, look at the overall treatment rates, irrespective of eligibility (the last column in Table 7). In the case of Kontum, 16.8 percent of all ethnic minority households received land through 132, and marginally higher, 17.8 percent, if 134 land is included. Under our broadest measure of potential treatment, nearly a third of ethnic minority households in Kontum received land, which is similar to treatment rates reported at the commune and provincial level.[11] Treatment rates outside of Kontum are ***significantly*** lower. Only 2.1 percent of all ethnic minority households received land from 132, with an additional 1.6 percent, or 3.7 percent in total, receiving land from 132 or 134. If we include newly reclaimed land since 2002 that may have also come from the state, 9.9 percent of all households received land since 2002, which does line up better with the commune and provincial reports. The household data thus confirm the much higher rates of program participation in Kontum, and the absolutely low rates of participation outside Kontum (with the narrowest definition of treatment).

Turning now to the linkages with eligibility, the easiest comparison is between those households with less than or greater than one hectare of land (i.e., potentially eligible to those who should not in principle receive any land). In Kontum, as well as in the remaining Central Highland provinces, there appears to be significant leakage in the treatment, with the ineligible almost equally likely to treated. Using "Treat 2" as the measure, 20 percent of households with land (in 2002) under one hectare received program land, while 15.5 percent of (in principle) ineligible households also received program land. While it is true that eligible households had a higher probability of treatment, the relationship between eligibility and treatment seems very weak. Outside Kontum, the leakage appears to have been just as severe. Using the broadest measure of treatment ("Treat 3"), slightly more ineligible households received land (11.0 percent versus 8.4 percent). Stated differently, between one-half to two-thirds of treated households were ineligible, depending on the treatment measure used.

Table 7 also reports the average treatment received by the two groups of households, as well as the average treatment (land received) conditional on receiving treatment. Differences in the unconditional amounts between eligible and ineligible households in both Kontum and outside Kontum are negligible. In Kontum, the average for both groups is 0.07 hectares, and only 0.01 hectares outside. Conditional on receiving treatment however ("Treat 2"), eligible

[11] Below, we discuss an alternative explanation for the difference relating to the fact that our panel does not pick up treatment of "newly-formed" households.

households actually received less land in Kontum (0.34 versus 0.49), while outside Kontum we observe the reverse (0.29 versus 0.23).

Reflecting the low treatment rates through 132 or 134, the average amount of land redistributed through the programs represents a small percent of total land: 6.8 percent in Kontum, and 1.1 percent outside. Using our broadest measure of treatment, this rises to 11.4 and 4.9 percent. Conditional on being treated however, the additional land represents in upwards of a third of average household landholdings in 2002.

4.2.4 Treatment regressions

To more formally evaluate the linkages between potential eligibility and treatment status, in Table 8 we report regressions (i.e., linear probability models) of treatment status on a set of covariates that includes land eligibility indicators (indicators of land holdings of annual, perennial, or total land in various size categories), controls for household size, education and forestry land, and commune dummies. We can then test whether these variables have any predictive content for program participation: Do land holdings in 2002, specifically, help predict treatment status. We can also determine whether there are departures from "random assignment" of treatment in other dimensions (e.g., income or education levels in 2002, household size in 2002). We estimate these relationships over minority households only, but do so separately for Kontum and the other Central Highland provinces.

The regressions confirm the patterns seen in Table 7: With rare exceptions, none of these variables, individually or jointly, is ever significant in predicting treatment. Adding commune dummies does not change the results. The commune dummies are themselves significant, suggesting important differences between communes in the likelihood of being treated. Within communes, however, household attributes are poor predictors. In short, reported treatment status is almost impossible to predict. The only exceptions are that outside Kontum, lower levels of perennial holdings are positively related to treatment (though the effect is small). This confirms the value of using (in principle) total land holdings, as opposed to annual land alone in trying to predict treatment status.

In Appendix Table 1, we show more attempts at predicting treatment status, using an expanded set of covariates, including the commune-reported level of treatment (without commune effects). The results in that table are the same: household treatment status is correlated with residence in a particular commune, and little else.

There are three main implications of this result:

- First, the program was not implemented as designed. There are many good reasons for this as we discussed earlier in the report (e.g., a shortage of land to redistribute).
- Eligibility is essentially unrelated to treatment. This removes our most elegant identification strategy for program evaluation. Instead, we will have to base the evaluation on *ex-post* treatment status.
- The program was implemented differently in Kontum to elsewhere in the Central Highlands. While levels of treatment were significantly higher in Kontum, however, the links between eligibility and treatment were also weak.

4.3 Correlations between 2002 Incomes and Treatments

How progressive were the land transfers? Did the poor benefit disproportionately?

An underlying premise of 132 and 134 and the allocation of land to ethnic minority is the view that landholdings are positively correlated with household incomes. Thus, targeting land for land-poor households will help improve the welfare of the neediest rural ethnic minority households. Land transferred through 132/134 may not have been directed to the land poor, but it may still have been directed to poor households.

In Table 9, we provide a breakdown of landholdings and treatment by income quartiles (in 2002) for Kontum, and then do the same thing for the Central Highlands excluding Kontum. In Kontum, there is only a very weak relationship between average landholdings and quartile. Average landholdings fall marginally between the first and second quartiles, and then rise slightly through the fourth. Outside Kontum, the link is stronger, especially with respect to perennial land, which rises from 0.25 hectares in the first quartile to 0.71 in the fourth. In total, households in the richest quartile have 75 percent more annual plus perennial land than households in the poorest quartile.

Annual land is only weakly related to household wealth, and is a poor marker of low income. Perennial holdings, on the other hand, are more concentrated among richer households.

In Table 9, we also report potential eligibility rates by income quartile. Eligibility typically falls through the quartiles, but the drop is much less than might be expected. In Kontum, the first quartile (Q1) has 44% of households with agricultural land over one hectare, implying an eligibility rate of 56%. This is actually lower the the next richest quartile (Q2), where only 27% of households have more than a hectare, and thus 73% are potentially eligible. Eligibility rates then fall through the next two quartiles. Outside Kontum, the link between potential eligibility and income quartile is stronger. This reflects the greater importance of more lucrative perennial land where there is a stronger link between acreage and income (as opposed to some of the larger more marginal farms of annual land in Kontum).

Of most interest from an equity perspective, household-reported treatment rates are fairly similar across quartiles, though higher in the middle. The same is generally true of treatment measured as a percentage of potentially eligible. Note, however, that potentially eligible households in the third quartile were typically the most likely to be treated. In Kontum, they were twice as likely as households in the other three income quartiles.

Land transfers were not disproportionately directed to low-land households. Nor were transfers directed towards poorer households. If anything, transfers went to the middle and upper income households (among minorities).

5. Assessing the Impact of Programs 132 and 134

We are interested in assessing the impact that the distribution of land through 132 and 134 had on rural household incomes in the Central Highlands between 2002 and 2007. Given that our identification strategy will be driven by before-and-after comparisons between treated and untreated households, it is useful to look at the broader changes that occurred in both land and incomes over this five-year period. Indeed, our survey allows a closer look at these dynamics for this sub-population than permitted by other surveys. Given the underlying premise of the program is that land is key to income generation, it is also helpful to have a ballpark estimate of the expected returns to an additional hectare of annual or perennial land.

5.1 Changes in Land

Households were specifically asked in 2007 whether they received land from the programs. Independent of these reports, we have detailed information in the 2002 and 2007

surveys to compare household land holdings. In particular, we wish to know whether minority households experienced improvements in their land holdings. We can compare the evolution of the land distribution between minorities and Kinh (who would not have been treated), and ultimately between minority households who report they were treated or untreated. First, in Table 10 we report land outcomes for ethnic minority and Kinh households in the Central Highlands. For our panel ethnic minority households, the data suggest an increase in agricultural land of slightly more than 20 percent from 1.21 hectares to 1.47. This was offset by the loss of almost all of the forest land households reported having in 2002.[12] Still, the data suggest that there was a relative increase in land holdings for minorities, consistent with the existence of the programs. Separate breakdowns for Kontum and non-Kontum are once again helpful. Ethnic minority households in both parts of the Central Highlands experience an increase in landholdings of agricultural land, but households outside Kontum report an increase of 23.6 percent compared to 15.8 percent in Kontum. Moreover, all of the reduction in forestry land occurs in Kontum.

The CDFs (cumulative distribution functions) reveal that the increase in mean landholdings was accompanied by similar reductions in Kontum and non-Kontum in the percentage of households with less than half of a hectare of agricultural land. In Kontum, the percentage of households with land under one hectare declines from 50.5 percent to 43.3 percent. Outside Kontum, there is similar sized drop in the percentage of households with less than a hectare of farmland, from 43.7 percent to 37.4 percent.

These simple summaries, however, do hide important subtleties. First, in moving from annual to perennial land, farm sizes generally shrink (so overall land is a poor summary of "farm capacity."). Second, there is a great deal of shuffling between annual and perennial land that may have an even greater impact on income changes than the simple total acreage. And finally, the averages hide the significant amount of churning that is occurring with land holdings. In Figure 2 we plot histograms of changes in land holdings for the Kinh and minority households. The change in land holdings is simply the difference between 2007 and 2002 household operated land. To allow for some round-off error, we allow small changes to count as "zero change." We then calculate the fraction of households with increases or decreases of land of varying amounts. In addition to showing the underlying heterogeneity of changes, and movements into annual or perennial land, we may also be able to detect program participation indirectly: Do we observe significant numbers of minority households receiving land between zero and one hectare?

[12] The reasons for the loss of forestry land among these households remains to be determined.

Overall, we can see that many minority households (compared to Kinh) experienced increases of their land holdings in the 0.25 to 0.75 range, consistent with the policy. We also see a significant number of Kinh with decreases in their operated land. For some households, this may reflect movement into perennials, and for others it may reflect movement out of farming altogether. Figures 3 and 4 provide more detailed breakdowns for annual and perennial land. Here we can see (in Figure 3) a general movement to larger holdings of annual land for minorities, but smaller holdings of annual land for Kinh. This is especially pronounced in Kontum. In Figure 4, we see more Kinh increasing their perennial land than minorities, especially in Kontum.

Table 11 provides another angle on the complexity of land dynamics, and also helps us better see the sources of new land among the panel households. Overall, more than a quarter of all ethnic households report "new" land that they had acquired since 2002, with the percentage in Kontum 44.2 percent. The three primary sources of this land are that identified as coming through 132 or 134, newly reclaimed land, and land that they were allocated long-term use rights to (presumably by the state). Outside Kontum, 24.0 percent of all households report acquiring new land, but land which might be linked to the state is significantly less than in Kontum. More important is land that is either inherited, or bought. Clearly, while important, program land is not the only way for minorities (let alone the ineligible Kinh) to have increased their land holdings between 2002 and 2007. This complicates the estimation of treatment effects, as the "control" households can obtain extra land through other means than the program.

To corroborate our VHLSS-based results, in Table 12 we use the Agricultural Censuses from 2001 and 2006 to provide a complementary perspective for the entire population in the region. The census data point to a slightly smaller increase in average landholdings of ethnic minority than in our panel, but also smaller differences in the size of these increases among ethnic minority in Kontum and those outside. The basic patterns are similar however, showing a relative improvement of the land distribution for minorities, and a general movement into perennials, especially outside Kontum.

More importantly, and of direct bearing to our earlier discussion of the household-reported treatment rates, the census data point to a significant increase in the total number of ethnic minority households from 253,821 in 2001 to 309,591 in 2006, exceeding population growth. Average household size drops for minorities more than for the Kinh. This underlies the smaller increase in land endowments in the Census compared to that observed among our panel: extra land is being absorbed by an increasing number of households (while our panel follows a

fixed number of households). The census data raise the possibility that some of the discrepancy between our household-based panel estimates of "treatment" through 132 and 134 and the province and commune-level estimates may be in the treatment of newly-formed households (or possibly migrant households), which would not be picked up in the panel. The census data imply an increase of twenty percent in the number of ethnic minority households between the two Agriculture Censuses. It is entirely possible that many of the "treated" households that we do not observe are newly formed households that may actually have been established to take advantage of the program: assignment of land was on the basis of households, not individuals. The programs may have facilitated household formation, especially in combination with the Program 134 residential subsidies.

Finally, note that in both data sources we observe an increase of agricultural landholdings by the Kinh. On average however the increase is smaller, and they continue to have less agricultural land than the ethnic minority. Of the land they do have however, more is perennial land. Moreover, amongst the Kinh, there are also a significant of households whose endowments are declining, likely reflective of a shift out of farming and into more lucrative non-agricultural activity.

5.2 Changes in Income

In Table 13, we report for minority households a breakdown of real incomes and expenditures for 2002 and 2007 (all expressed in constant 2007 VND). Once again, we do this separately for Kontum and then outside Kontum in the Central Highlands. In 2002, real household incomes in Kontum were 17.177 million VND. Per capita incomes were 3.145 million, while per capita expenditures were slightly lower at 2.533. (These estimates imply that these households were saving in upwards of twenty percent of their incomes.) Nearly three-quarters of income came from cropping and agriculture-related sidelines, e.g. forestry and animal husbandry, with income from wages making up most of the rest. Incomes outside Kontum were modestly lower, with income from wages (sidelines) playing a more (less) important role.

We observe a *sharp divergence* in the behavior of incomes between provinces. In Kontum, total household as well as household per capita real incomes *fell* between 2002 and 2007 (adjusting for inflation). Similar behavior is seen in our estimates of per capita expenditure, confirming that this is not an artifact of problems in measuring income. Cropping income rises by nearly 30 percent, and wages by 43 percent, but these increases are more than offset by the sharp

fall in sidelines (primarily forestry and livestock) of 79 percent. This decline is consistent with the reduction in forestry land reported earlier in Table 10, and the ability of ethnic minority households to derive income from the forest. More generally, this may reflect national efforts to move ethnic minority into more sedentary agriculture, and the loss of informal land rights associated with the redistribution of state land through 132.[13] Indeed, the decline in sideline activities may be attributed to the broad program and land policy: whether households were "treated" or not, they may have lost access to forest land and sideline activities.

Contrast this behavior with the growth in the Central Highlands outside Kontum, where per capita incomes almost doubled from 2.808 million to 5.559 million. Largely driving this growth is the sky-rocketing growth of income from the cropping sector, which can be linked to land in perennials in 2002. This increase is complemented by growth in wage income, which is slightly larger in percentage terms than we observe in Kontum. The Central Highland provinces outside Kontum also experience a reduction in incomes from sidelines, but of much smaller magnitude.

The differing experiences of Kontum and the other CH provinces further undermine our original evaluation strategy. Most obviously, minority households outside Kontum are a poor control group for treated households inside Kontum. Compounding this problem, the treated households are concentrated in Kontum. Ignoring this problem would lead to negative "treatment effects": The treated households in Kontum fell far behind the untreated minority households outside Kontum. But this had nothing to do with their treatment status, and instead reflected differences in outcomes between provinces. In particular, minority households outside Kontum had greater holdings of perennial land, which saw extraordinary returns over this period. We can also see in this table that the Kinh would be an inappropriate control group, as their incomes grew even faster than the minorities; however well the minorities fared outside Kontum, they fell even further behind the Kinh.

5.3. The Value of Land

What is the "best case scenario," back-of-the envelope estimate of how much richer a household could get with an extra bit of land?

[13] Only twenty percent of all ethnic minority households in Kontum reported forestry land in 2002. The reduction in incomes from sidelines extends much further, suggesting either under-reporting of forestry land, or more likely, changing rules regarding access and use.

The potential impact of 132 and 134 depends not only on who receives land, and how much they receive, but also the potential income that can be derived from a small tract of land. In order to get a handle on this, in Table 14 we report the results of "value of land" regressions. These regressions enable us to look at three important questions:

1. Are returns to land different for minorities and Kinh?
2. Are the returns the same in Kontum and elsewhere?
3. How much more lucrative is land under cultivation with perennials?

We do this several different ways. First, we estimate cross-section regressions separately for 2002 and 2007, relating crop income from a given year to the land used that year. In columns 1 and 2 therefore, the dependent variable is the total net income earned by the household from cropping, regressed on household holdings of annual and perennial land. Other controls include household size, male and female education, and commune fixed effects. We also include a minority status dummy to allow returns to the two kinds of land to differ between the ethnic minority and Kinh, and a Kontum dummy to allow the returns to differ inside and outside of Kontum. In general, we expect the returns to perennial land to exceed that to annual, but recall that land types may only imperfectly capture land use. Moreover, at any given point in time, households may be in the process of shifting some of their annual land into perennial crops. If reclassification occurs only with a lag, this could bias the comparison of returns. In addition, it typically takes three to four years before newly planted land in perennials begins to generate income.

In 2002, the returns to perennial land are only marginally higher than those to annual land. For the base group (Kinh outside Kontum) the average return is 6.076 million VND compared to 5.549 for annual land. To help put these numbers in perspective, average per capita incomes in 2002 were in the vicinity of 3 million VND. The return to annual land in Kontum is slightly higher than that outside Kontum, but the returns to perennial land are significantly lower. The gap in returns between ethnic minority and Kinh only shows up in the returns to annual land. Moreover, amongst the ethnic minority, returns to perennial land are two and half times that to annual land (6078 versus 2385). In the bottom of each column, we report the combined (sum) for other groups (i.e., minorities, and Kontum).

For 2007, the returns to both annual and perennial land are significantly larger, but the increase is much more pronounced in the case of perennials. This is especially so outside Kontum, though even in Kontum the returns to perennial land exploded. Amongst the ethnic minority, the returns to both types of land are higher in 2007, but the increase lags that we observe amongst the Kinh. Note again that the returns to perennial land could increase for a variety of reasons: the trees (e.g., cashews or coffee) may be more mature and yielding more output, or the prices of these crops may have increased (in fact, it was likely both factors).

These regressions are complemented by two specifications based on changes in crop income between 2002 and 2007. The first (in column 3) is somewhat unconventional as a production function: we estimate the change in income as a function of the levels of variables in 2002. This however mimics our main program evaluation regressions, where we estimate the effect of program participation conditional on a full vector of 2002 characteristics. In column 3 we can see that those households that had perennial holdings in 2002 had the greatest increases in crop income. Indeed, holding one hectare of annual land (all else equal) did not yield any increase in crop income (though it of course yielded the same level of income per hectare). In this specification, it is clear that access to perennial land in 2002 was critical to increased crop income over this period (being in the annual business yielded no income growth).

In the last column (4), we estimate a more conventional "first difference" specification: Were changes in land associated with changes in crop income? If a household received 0.5 hectares of land (from Program 132 or 134, or some other means), were they able to turn this into more crop income? This gives us the best possible estimate for the potential impact of program land. In the bottom panel we see that an extra hectare of annual land for a minority yielded an average of 2.097 million VND, while an extra hectare of perennial land yielded 8.339 million VND (for minority households). The return to annual land was actually higher in Kontum (than outside Kontum), and also higher for non-minorities. As we move to our more formal estimates of the effect of treatment, it is clear, however, that land is a valuable asset for all households in the Central Highlands. Receiving "free" annual land (i.e. Treatment) should increase crop income.

5.4. The Effect of Treatment

Did access to land through 132 and 134 make a difference to minority households? Before moving to our main regression results, in Table 15, we compare changes among treated

and untreated minority households. Such means provide the basis of the "difference-in-differences" regressions. We examine changes in land, as well as changes in households' income, and its selected components. We would like to see whether treated households had greater improvements in their land access, and furthermore, whether they converted this to more income. In these comparisons, we use two alternative definitions of treatment: land from 132 or 134 (Treat 2), and then our broader measure that includes reclaimed land that may have also come from the state (Treat 3).

For example, consider the first two columns comparing treated and untreated minority households in Kontum. Here we can see that treated households had annual land increase by 0.28 Hectares, compared to only 0.04 for the untreated. This suggests a potential treatment effect of 0.24 Hectares (treatment minus control). Treated households apparently did get more land (about a quarter Hectare). There was no difference between treated and untreated households as far as perennial holdings were concerned. Outside Kontum, remarkably, treated households (using treat 2 as the measure), experienced relative declines in their annual land, but relative increases in their perennial land. This is the opposite pattern of Kontum. If we use "Treat 3" (including reclaimed land), we get the same picture in Kontum, but a reversal outside Kontum: clearly, most reclaimed land is classified for annual crops (at least initially).

Moving to changes in crop income (for Kontum), we see that untreated households experienced growth of 1.475 million VND, but treated households had crop income rise by 5.079 million VND. If treatment status is only related to crop income by the increase in land, then this suggests that treated households received more land, and turned it into about 3.5 million VND of income (treatment minus control). But they did not come out ahead in all dimensions, as program participants experienced slightly larger declines in sideline income (-5.270 versus -4.717 million VND). Outside Kontum, crop income grew more slowly for treated households (continuing with Treat 2), and sideline income dropped by more as well. Outside Kontum, program participants had incomes grow by 4.955 million VND, considerably less than non-participants whose income grew by 12.945 million VND. While it is possible that these households were "losers," the land data suggest that part of the explanation is due the relative shift of treated households into perennials that may not have yet borne fruit.

Table 16 provides the more rigorous regression counterparts to these comparisons. The basic specification is:

$$y_{h,07} - y_{h,02} = \alpha + \beta Treat_{h,07} + \gamma' X_{h,02} + u_h$$

where $y_{h,07} - y_{h,02}$ represents the change between 2002 and 2007 for a particular outcome; $Treat_{h,07}$ is household reported treatment status from the 2007 survey; and $X_{h,02}$ is a vector of household controls, all dated 2002. Our covariates include detailed land categories for 2002 (i.e., all possible determinants of household eligibility that may otherwise have been correlated with income growth), household size and education in 2002, and commune fixed-effects. We measure treatment in four ways: indicators of treatment status ("Treat 2" and "Treat 3", as in Table 15), as well as the intensity of treatment (how much land was received through Treat 2 or Treat 3). In these regressions, we use two sets of control groups:

1) All "untreated" minorities that live within the same commune. This arises from the commune-fixed effects estimator. We do not believe that households in other communes represent a very good control group, so all specifications have commune fixed effects;
2) In case we are comparing "apples and oranges" even within a commune, and in case the regression does not fully control for observable differences between households, we use a very simple matching estimator. This simple refinement of the control group is based on Crump, Imbens, Hotz and Mitnik (2009). Essentially, we estimate a treatment equation with a rich set of covariates (as in Table 8 and Appendix Table 1), and discard the 25% of households with the lowest predicted probability of treatment. This restricts the "control group" to those households who look most like those who were treated.

Regression results are presented in Table 16, with the shaded columns showing estimates from the "matched" control group. Results are generally robust to the trimming of the control group, so we restrict our discussion to the full sample. Looking first at Kontum, we see that the intensity-based measure of treatment is strongly correlated with changes in annual land (the indicators of treatment are positive as in Table 15, but not significant). Changes in perennial land are negatively related to treatment, suggesting that in Kontum, households were tilted towards the cultivation of annual crops. And this appears to have had an impact on their 2007 incomes, at least if we use the treatment status measures. As seen in Table 15, treated households had increases in crop income, but declines in sideline income. The magnitude of the increase also lines up with the value of land (Table 14).

Outside Kontum, the results also echo Table 15 in sign, though very few of the coefficients are statistically significant. Treated households experienced reductions of annual land, increases of perennial land, and reductions of total income (and especially sideline income). The tilt towards perennials may account for the "negative treatment effect." Since much of the land through 132 and 134 was only allocated at the earliest by 2004, by the end of 2007 the impact of expanded acreage in perennials on cropping (and total) income would have been marginal. Net incomes might have been biased down because households continued to incur production costs on this land in the interim. Consistent with this is the fact that the percentage of total sown area of ethnic minorities outside Kontum in perennials increased significantly from 22.0 percent to 36.2 percent between 2002 and 2007, while in Kontum it only increased from 0.6 to 3. 6 percent.[14]

5.5 Summary of our findings with respect to Land Redistribution

Half of all ethnic minority households in the Central Highlands were eligible for treatment through 132 using a hectare of annual or annual plus perennial holdings in 2002 as the threshold. A relatively low percentage of ethnic minority households were treated, with the percentage significantly higher in Kontum than elsewhere in the Central Highlands. In Kontum, 17.8 percent were treated through 132/134, but only 3.7 percent were outside. These estimates of treatment are lower than commune and province level estimates. This likely reflects a combination of measurement error and our sampling strategy.

Not only were treatment rates low, but there appears to have been significant leakage in the treatment. In Kontum, treatment rates of non-eligible households were only modestly lower than treatment of eligible. The same is true outside. Eligibility and treatment are also only loosely correlated with income quartiles. In this respect, the neediest households would not necessarily have been identified (or treated) on the basis of land. Households in the third income quartile (50-75th percentile) seem to have done particularly well in terms of capturing the benefits of the program.

"Value of land" regressions we estimate suggest that additional land was valuable to households. In principle, beneficiaries of Program 132/134 should have realized higher incomes. On average, those treated received around a third of a hectare, and slightly more in Kontum than

[14] In Appendix Table 2 we report estimated treatment effects for other functions/indicators of income (e.g., per capita income and log per capita income).

outside Kontum. In Kontum, we find a positive effect of the treatment on both cropping and total household income. Outside Kontum, we do not see any effect, with the incomes of the non-treated, including cropping income, increasing much more rapidly for the non-treated than the non-treated. In fact, there may have been a negative treatment effect, with the land directed towards those households least able to take advantage of the growth opportunities.

6. Program 134 Support for Housing and Water

6.1 By Housing Values in 2002

Program 134 also targeted minority households for housing support. Eligibility criteria were often locally determined, thus making it difficult for us to assess how successful communes were in helping those they identified as most in need. As an alternative, in Table 17 we organize minority households into quartiles on the basis of the self-reported value of their housing in 2002. Average housing values rise from 2.275 million VND for households in the lowest quartile to 32.095 for those in the highest. Living area, measured in terms of square meters, nearly doubles between the first and fourth quartile. Other amenities such as having a toilet are also positively correlated with housing values.

For each quartile, we report the percentage of households that constructed a new house since 2002, and the percentage that received government support. Conditional on receiving support, we also report the average value of the subsidy. In total, slightly less than thirty percent of all minority households constructed new homes since 2002. The likelihood of building a new house is also highly correlated with need, as measured by the value of the house in 2002. Half of all households in the lowest housing quartile constructed a new house, followed by 31.8 percent in the second quartile. By comparison, only 13.7 percent in the upper quartile did so. The percentage of households receiving government support also falls through the distribution as does the percentage of those building a house that receive support. In the lowest quartile, for example, 86.1 percent of all households building new homes received support. By comparison, half of those in the third and fourth quartiles do so. On average, the value of support from 134 was fairly similar across the quartiles, with households typically receiving in the vicinity of 6 million VND.

Much smaller in scale was support for investment in new sources of water, typically wells, tanks or connections to a village water system. Overall, 10 percent of all households

received support, with much of this concentrated in the lower quartile of housing values in 2002. Those households in the upper quartiles that received support however received larger subsidies.

In general, the housing program appears to have done much better in identifying and targeting the most needy as measured by initial housing values. Altogether, 51.9% of all subsidies extended for housing and water went to households in the first quartile, with an additional 26.9% going to households in the second quartile. In so far as housing values are correlated with welfare, leakage to better off households appears to have been minimal.

6.2 By Incomes in 2002

An alternative way to examine the distribution of benefits is on the basis of the same per capita income quartiles used earlier to examine benefits associated with land from 132 and 134. This also allows an explicit comparison of the progressivity of the treatment. The cutoffs between the first and second, second and third, and third and fourth quartiles are 1.90, 2.58 and 3.44 million VND. In Table 18, we do exactly this, with the percentage of households in each quartile receiving land from 132 or 134 reproduced in the first row. Across income quartiles, differences in the average size of homes in 2002 are negligible. There are more significant differences with respect to the value of homes, but these differences are compressed compared to the estimates provided in Table 17.

A slightly higher percentage of households in the two first two income quartiles constructed new homes, and also were more likely to receive government support conditional on building. For example, 29.2 percent of households in the first income quartile built new homes, of which 80.1 percent received government support, compared to 24.9 and 65.2 percent, respectively, for households in the third income quartile. Nonetheless, the benefits of 134 were more evenly distributed throughout the income distribution than we observed on the basis of housing values. For example, the bottom quartile of the income distribution received only 30.3 percent of the combined benefits for housing and water compared to the 51.9 percent received by the bottom quartile of the distribution based solely on housing values. This was offset by the upper three quartiles receiving significantly more, with the households in the 50-75th percentile receiving 22.2 percent of the benefits.

In Figure 5, we evaluate the relative "progressivity" of the land and housing programs, by comparing the percentage of households by income quartiles that received land from either 132 or 134 with the percentage that received housing benefits from 134. The bottom of the income

distribution fared strikingly better with respect to housing than land. Overall, it appears that the two middle quartiles did especially well (for both programs), with the third income quartile offsetting slightly less support for new housing with the receipt of more land.

7. Conclusion

We use the conclusion to raise a number of issues that seem worthy to examine moving forward. First, our results identified that a much higher percentage of households are treated, and more land is reallocated in Kontum, than outside Kontum. A simple explanation for this is that land is not as scarce, and thus implementing 132 was easier and less expensive in Kontum. An alternative explanation focuses on the differences in the political economy of policy implementation and possibly local opposition to reallocating valuable land from state forests and farms. Such opposition might come from the state forests themselves, or possibly households that are using this land under long-term contracts. We also observed that in Kontum ethnic households make up the majority of the population, which may matter for the priority given to the policy by local leaders.

Second, the effectiveness of the policy in treating the poor was undermined by significant leakage of land to households who were neither the "most needy" with respect to land or incomes. We need to know more about the processes through which villages and communes identified those households eligible for land, and treatment.

Third, programs 132 and 134 focused on reallocating land. But as important as how much land households have in the Central Highlands is how that land is used. Annual and perennial land categories should not be viewed as fixed, and land can be converted. Based on our calculations, there is as much, if not more, to gain from converting annual land to perennial as there is to providing more annual land. Policy may want to focus on land use, and to providing the complementary inputs that are required. These need to be identified however, and structures developed to help deliver them through public or private channels.

Fourth, in the case of Kontum, we noted a sharp drop in income from farm and forestry sidelines between 2002 and 2007 that appears correlated with a loss of forestry land by a significant number of ethnic households. We need to know more about the factors underlying the loss of access to this land.

Finally, results at the household level suggest a much lower percentage of "treated" households than estimates provided at the commune or province level. We have suggested a

number of alternative reasons for this, including the possibility that land went to new-formed households. It will be beneficial to confirm that this was indeed the case.

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Appendix: Decisions 132 and 134 Documents

Decision 132/2002/QG-TTg dated 08 October 2002 of the Prime Minister on redistributing production and residential land for ethnic minority people in Central Highlands

Article 1. Resolving land for ethnic minority people in Central Highlands, to ensure that the ethnic minority households can have basic land for production activities as well as residential land. This is to improve their lives, enhance the development and ensure the security in Central Highland regions. Land should be basically redistributed to ethnic minority households who have not or lack of residential and production land at the end of 2003.

Article 2. The minimum distribution of agriculture land and residential land for each household is 1 hectare of terrace land or 0.5 hectare of paddy land (single crop) or 0.3 hectare of paddy land (double crop) and 400 m2 for residential land. As for perennial land, basing on production capability and the lack of land situation, there will be a suitable amount of land to be redistributed. The households who have not agriculture land will be provided forestry land, the distributed land amount will be followed the direction of the decree no 163/1999/NDD-CP dated 16 November 1999 of the Government on land redistribution, land lending to organization, households and individuals to use permanently for forestry purpose.

Article 3. Resolving principles

1. Ensure the equality and transparency of the redistribution to households, villages based on Government regulation and land policy. No consideration on resolving the issue of requesting old land.

2. To be suitable with custom of each ethnic group in close connection with the local socio-economic development plan towards the target of building a civilized and modern rural area, conserving traditional culture of each ethnic group.

3. Land redistributed households should directly managed and utilized their residential and production land. Within 10 years, they are not allowed to sell, mortgage in any form. If they are discovered to do that, they will be withdrawn and be not able to be redistributed again.

Article 4. Land fund for redistributing to ethnic minority households includes:

1. Land from state owned agriculture and forestry farm consists of: a. Excessive land after re-planning, land has not been used or ineffective production land; b. Land is near river wharf or villages where ethnic minority people are living in; c. Land from the households who have contract with state owned agriculture and forestry farm. If the average land holding of these households exceed local general average land holding, it will be adjusted to give the excessive land to the land fund. The land includes annual land, perennial land and forestry land.
2. Withdrawn land from state owned agriculture and forestry farm if necessary
3. Withdrawn land from ineffective production land, wrong purpose use of enterprises or from the enterprises which are closed down.
4. Land from farmers who have large land and would like to transfer a part of their land with compensation following the Government regulation.

5. Land for public use which has been managed by local authority
6. Reclaimed land, unexploited land
7. Forestry land with water source, poor or low economic effectiveness forestry land are allowed to change the using purpose into production land (the implementation of converting from forestry land to production land following government regulations on land and forestry development and protection is a must.)

Article 5. Implementation budget

1. Central budget:

Budget for reclaiming is on average of 4 million VND per hectare. As for households who reclaim themselves following local plan, they are allocated the same amount of money. The compensation for withdrawn land from households' reclaimed land is no more than 4 million VND/ha.

2. For withdrawn garden value

a. State owned enterprises' garden

If the enterprise's garden is invested by state budget, then the budget allocated to the enterprise will be noted as reduction correlatively to the practical value of the garden after reassessment and be debited against to household who is allocated the garden.
If the enterprise borrows from bank to invest in the garden, they are leaved the debt in a certain time with no interest rate, the state will support the bank in term of interest rate.

b. As for withdrawn garden which are from and invested by private enterprises and individuals, then local authority will resolve by their own budget.

3. Households are allocated perennial garden will be debited (with no interest rate) the garden value at the allocated time. Time for repaying debt will be appropriate to the economic cycle and production time left of the garden, but the maximum time is 10 years. Households repay debt before the regulated time will be reduced price. Specific reduction level will be regulated by the Ministry of Finance.
The President of People Committees in Central Highlands will preside the withdrawing of garden debts of households who are allocated land relating to garden.
Obtained debt, will be firstly paid for the owners of the gardens, and then the rest will be invested to local infrastructure, irrigation, electricity, clean water.

4. Ministry of Finance, Ministry of Planning and Investment will base on specific proposal of each province to approve and arrange enough budgets during two years (2002-2003) to implement. In 2002, state budget will be advanced for the implementation; the rest will be taken from proposed budget in 2003.

Article 6. Form of land redistribution and land use management

1. Production land: Ethnic minority households who depend on agriculture and forestry production have no land or are lack of production land will be distributed land directly from the

local people committee with the standard amount following Article 2 in this Decision. In order to help ethnic minority households to have enough land for production ensuring their lives, within 10 years, land distributed households of this program will be not allowed to transfer and mortgage in any form. Any organization or individual come to purchase ethnic minority households' land will be seized without compensation.
After redistributing land to ethnic minority households, local people committees have the responsibility to monitor carefully the use and management of redistributed land following this Decision in order to avoid the situation of selling or mortgaging land.

2. Residential land: The households who have no residential land will be provided land to construct their houses, the standard amount is indicated in Article 2 of this Decision and will be given land use certificate permanently following government regulations.

Article 7. Implementation organization

1. The President of the Provincial People Committees in Central Highlands will have the responsibility to review land demanding household list of their own provinces and coordinate with Ministry of Agriculture and Rural Development, Ministry of Military, State owned rubber corporation, State owned coffee corporation, Army Corps 15, Army Corps 16 to rearrange state owned agriculture and forestry farms, state owned agriculture enterprises in local area as in following direction: transfer all unexploited land, ineffective land and a part of currently used land (including land is near river wharf and village) of the state owned agriculture and forestry farms to local authority in order to distribute to ethnic minority households).
In 2002, the pilot should be completely implemented in some district, villages in order to get experiences and adjust the implementation plan so that in 2003, production and residential land redistribution is basically finished following this decision.
In parallel with land redistribution, the extension activities for agriculture, forestry, money lending, product sale, house construction, etc should be well organized to help ethnic minority people to improve their lives.
Inspection on the management, utilization of land in implemented provinces should be taken place in order to prevent and punish any activities on purchasing land, mortgaging land illegally.

2. Ministry of Agriculture and Rural Development will preside and coordinate with two other Ministries including Ministry of Finance, Ministry of Natural Resources and Environment to assess the land support proposals of Central Highlands provinces following this decision prior to the time President of People Committees in Central these provinces approve their own land support proposals.

3. Ministry of Natural Resources and Environment will preside and coordinate with Ministry of Agriculture and Rural Development to monitor the implementation in Central Highland provinces; Ministry of Finance will take the responsibility to guide and check the budget utilization during the implementation of this decision.

Article 8. This decision is in effect since its signed date.

Article 9. Ministers of the following Ministries: Ministry of Agriculture and Rural Development, Ministry of Finance, Ministry of Planning and Investment, Ministry of Natural Resources and Environment, Ministry of Labour, Invalids and Social Affairs and Minister of Central Ethnic

Minority Committee, President of State Bank, President of People Committee in following provinces: Lam Dong, Dak Lak, Gia Lai and Kon Tum have the responsibility to implement this decision./.

Prime Minister
Phan Van Khai

Decision No 134 of the Prime Minister on supporting production land, residential land, houses and daily use water for poor ethnic minority households.

Article1. Implement policies on supporting production land, residential land, housing and daily use water for poor ethnic minority households in associated with other socio-economic program of Government to support ethnic minority households to afford production activities, improve their lives and escape from poverty.

1. Target group

Local ethnic minority households who are permanent residents, poor ethnic minority households who are living based on agriculture and forestry activities. These target groups should be eligible for the program if they have not or are lack of production land or residential land and meet difficulties in terms of houses, daily use water.

2. Principles

a. Support production land, residential land and houses, daily use water directly to poor ethnic minority households

b. Ensure the transparency, equality in supporting to each household in every village following Government regulations and policies.

c. To be suitable with custom of each ethnic group, region, and conserve the culture character of all ethnic groups, be suitable with practical conditions and be in associated with local plan on socio-economic development.

d. Households who are distributed production land, residential land, houses and daily use water should manage and use the supported items directly. This is to ensure production development, living condition improvement and contribute in poverty reduction. In particular case, if supported households (production and residential land) want to move to another province, they should transfer their land use right to the local authority to redistribute to other poor ethnic minority households.

If they do not follow this regulation, Government will withdraw with no compensation to redistribute to ethnic minority households who have not land or are lack of land.

Article 2. About policies

1. Production land

The minimum amount of redistributed land for one household includes 0.5 ha of terrace land or 0.25 ha of single paddy crop or 0.15 ha of double paddy crop. Based on local land fund, labour capacity, and number of members in each household and local budget, the provincial people

committees may consider and decide to redistribute land to the ethnic minority households with higher amount.

2. Residential land

The minimum amount of redistributed land is 200m2 for each ethnic minority household in rural area. Based on local land fund and budget, the provincial people committee will consider to redistribute residential land to ethnic minority households with higher amount.

The State will have particular policies to support on production and residential land for poor Kho me ethnic group due to the characteristics of Mekong river delta.

3. Housing

Regarding poor ethnic minority households (including Kho me) have no houses or houses are damaged partly, the support will follow the direction "People should construct themselves, the State will support and the community will help".

a. Central budget will be delivered to support the amount of 5 million VND/household to construct houses. Based on situation and budget, the local authority will put an additional support and encourage the help of the community
b. As for the provinces that possess forest planned and annual wood exploiting plan approved, the provincial people committees are allowed to exploit wood under common regulation to support ethnic minority households to construct their houses. The amount of wood to be distributed will be decided by the provincial people committee. It is not allowed to take this advantage to destroy the forest.

4. Support on daily use water

a. The ethnic minority households are scattered living in upland, mountain, etc where are difficult to get daily use water, the State will provide an amount of 0.5 ton cement/household from central budget to construct water tank or support the amount of 300. 000 VND/household to sink well or find a daily use water source.

b. As for common daily use water building, the State will support 100% from central budget to villages which have above 50% of total households are ethnic minority households, support 50% to the village which have from 20% to below 50% of total households are ethnic minority households. The local daily use water construction must be ensured of the effectiveness and the sustainability.

Article 3. Land fund for redistributing land to ethnic minority households includes:

1. Public land which have been withdrawn by the State following the general planning. Land is allocated with contract to households from State owned agriculture and forestry farms.

2. Land is withdrawn from State owned agriculture and forestry farms due to ineffective use.
3. Land is reclaimed from bared and hilly land or abandoned land
4. Land is withdrawn from state enterprises that use land ineffectively and for wrong purposes or enterprises are closed down; land is withdrawn from individuals who appropriate illegally.
5. Land is being managed and used by State owned agriculture and forestry farms but is used by ethnic minority households long time ago should be adjusted to be reallocated with contract to ethnic households as production land (including the area of perennial crops or forest) to use following general regulation. The specific amount will be decided by provincial people committee.
6. Land is given or transferred from other households voluntarily
7. As for the case of having no land for agriculture production, forestry land will be used to redistribute. The redistributed amount will be followed the Decree no 163/1999/ND-CP dated 16 November 1999 of the Government in redistributing, lending forestry land over organizations, households and individuals for long term use; and regulations of Land Law.

Article 4. Support in creating production and residential land fund

1. Central budget will support to create production and residential land fund, consisting of reclaiming, compensation for withdrawn land, transferred land from other households who have large land with amount of 5 million VND per hectare. Based on local practical situation, the provinces will decide specific regulations.

2. If the state owned agriculture and forestry farms are assigned to organize production activities for ethnic minority households, they are also supported by central budget for reclaiming with amount of 5 million VN per hectare. Moreover, they are also supported capital for constructing roads, electricity network and small irrigation building.

Article 5. Implementing budget

1. Central budget should ensure the expense amounts following regulations of this decision

2. Local budget should contribute the amount of over 20% of total Central budget as well as encourage other legal budget sources in order to implement this policy.

3. The local take the initiative in providing budget for measuring land, issuing land use certificate for ethnic minority households

Article 6. Implementing organization

1. Provincial people committees have the responsibility to directly and comprehensively preside and organize the implementation of this policy

a. Announce publicly the criteria, target group and conduct a survey to obtain the list of poor ethnic households who have not or are lack of production and/or residential land and meet difficulties in terms of housing, or daily use water.

b. Design and approve proposals on redistributing production land, residential land, housing, daily use water for poor ethnic minority households in local area (including the promulgation of Decisions on adjusting contracted land and withdrawn land from state owned agriculture and forestry farms which are under the management of ministries and other local situated institutions) in order to send to Ministry of Planning and Investment, Ministry of Finance for reviewing and submitting to the Prime Minister so that annual plans can be approved.

The above mentioned activities should be completed during the third quarter of 2004. If there are any constraints, it is needed to report to the Prime Minister and Ministries as well as related institutions to resolve.

c. Direct the related institutions, local authorities and other socio-political organizations to implement effectively support policies to poor ethnic minority households, contribute in poverty reduction and improve the lives of ethnic minority households.

d. Monitor regularly the implementation process, ensure that the policy go to all ethnic minority households, the corruption is not allowed.

e. By the end of 2006, the implementation of policies in this Decision should be basically finished.

2. Ministry of Agriculture and Rural Development has the responsibility in leading, guiding and helping the provinces in constructing and upgrading small irrigation building, supporting on seeds, animals, resolving daily use water and rural environment hygiene towards the direction of production development and poverty reduction.

3. Ministry of Construction will guild and monitor the provinces in implementing the policies of supporting houses for ethnic minority households.

4. Based on the proposal on resolving production land, residential land, housing, daily use water approved by the provincial people committee, Ministry of Planning and Investment will preside and coordinate with Ministry of Finance to review the plan, allocate additional targeted budget to the provinces within proposed plan and central budget in 2005, 2006 and then submit to the Prime Minister for final decision.

5. Ministry of Finance will submit to the Prime Minister for approval specific policies in terms of withdrawing production land from state owned agriculture and forestry farms (including perennial crops and planted forest) in order to allocate with contract to poor ethnic minority households.

6. Central ethnic minority committee will preside and coordinate with other Ministries, related institutions to guide and monitor the implementation of this Decision, and report to the Prime Minister periodically.

7. Ministries, related institutions based on their own mandates will have the responsibility to monitor and support the provinces to implement effectively the policies regulated in this Decision.

Article 7. This Decision will be in effect after 15 days from the first day to be public in Government legal document. To declare off the Decision no 154/2002/QD-TTg dated 12 November 2002 of the Prime Minister on policies for ethnic minority households and other households in Central Highlands selected for the policies on purchasing houses with deferred payment.

Article 8. Ministers, Heads of the institutions are at the same level with the Ministries, Heads of Governmental institutions and the Presidents of City/Provincial people committees under central management will have the responsibility to implement this Decision./.

Prime Minister

Phan Van Khai. Signed.

TABLE 1
Minorities in the Central Highlands: Simple Comparisons to Others in Vietnam
VHLSS 2002

	Compare CH to Outside CH		Within CH	
	Outside CH	**All CH**	**Kinh**	**Minority**
Proportion Minority	0.15	0.43	0.00	1.00
Land Endowment:				
Annual Land (Ha.)	0.38	0.63	0.40	0.93
Percentage with Annual Land	75%	72%	59%	90%
Perennial Land (Ha.)	0.10	0.59	0.75	0.39
Percentage with Perennial Land	37%	66%	73%	57%
Agricultural Land (Ha.)	0.48	1.22	1.14	1.32
Percentage with Agrigultural Land	81%	95%	92%	99%
Forestry Land (Ha.)	0.16	0.19	0.05	0.37
Percentage with Forestry Land	11%	5%	3%	9%
Total Land (Ha.)	0.64	1.41	1.19	1.69
Percentage with Any Land	82%	95%	92%	99%
Demographics				
Household Size	4.51	5.19	4.77	5.74
Education (Years of Schooling)				
Male	7.01	5.87	7.55	3.79
Female	5.91	4.68	6.48	2.56
Expenditure/Income				
Per Capita Expenditure	4,053	3,275	4,218	2,282
Gini (per capita expenditure)	0.29	0.30	0.28	0.25
Per Capita Income	5,304	4,136	5,056	2,925
Gini (per capita income)	0.36	0.33	0.35	0.31
Sample Size	54,120	3,000	1,705	1,295

Source: VHLSS 2002

1) All nominal values (for income and expenditure) expressed in '000 of VND (2007 Prices)

2) Average years of schooling calculated over the sample aged 15 years and older

TABLE 2

Profile of Land Distribution: Agricultural Census, 2001 (By Province)

	All CH		Kontum		Gia Lai		Dak Lak		Lam Dong	
	Kinh	**Minority**	**Kinh**	**Minority**	**Kinh**	**Minority**	**Kinh**	**Minority**	**Kinh**	**Minority**
Population	2,257,721	1,397,797	91,630	176,930	408,407	444,547	1,143,271	559,989	614,413	216,331
Number of Households	493,026	253,821	20,642	34,488	91,407	80,280	244,854	100,353	136,123	38,700
Household Size	4.58	5.51	4.44	5.13	4.47	5.54	4.67	5.58	4.51	5.59
Agricultural Land/HH (Ha.)	1.00	1.14	1.18	1.05	1.13	1.21	1.00	1.11	0.90	1.12
Annual Land/HH (Ha.)	0.30	0.70	0.55	0.92	0.52	0.93	0.28	0.54	0.17	0.41
Perennial Land/HH (Ha.)	0.69	0.42	0.62	0.12	0.61	0.27	0.71	0.54	0.72	0.69
Forestry Land/HH (Ha.)	0.04	0.60	0.06	1.28	0.00	0.01	0.05	0.59	0.04	1.24
Land Distribution										
Proportion of Households with:										
Agricutural Land = 0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Agricultural Land > 0 & < 0.5	0.21	0.11	0.18	0.21	0.20	0.14	0.20	0.07	0.26	0.08
Agricultural Land >0 & < 1.0	0.53	0.54	0.47	0.56	0.49	0.53	0.53	0.54	0.58	0.54
Agricultural Land > 1.0	0.25	0.35	0.35	0.23	0.32	0.33	0.27	0.39	0.15	0.38

Source: Authors' calculations based on GSO tabulations from the 2001 Agricultural Census

1) All land variables expressed in Hectares per household

TABLE 3

Comparing Sampled (Panel) Households to Others from VHLSS 2002

	All CH		Minoritiy Households		Kinh Households	
	Sampled	**Not Sampled**	**Sampled**	**Not Sampled**	**Sampled**	**Not Sampled**
Percentage Minority	74%	24%	100%	100%	0%	0%
Annual Land (Ha.)	0.73	0.57	0.84	1.11	0.40	0.40
Perennial Land (Ha.)	0.40	0.71	0.37	0.43	0.49	0.80
Agricultural Land (Ha.)	1.13	1.28	1.21	1.54	0.89	1.19
Forestry Land (Ha.)	0.16	0.20	0.21	0.65	0.02	0.06
Land Distribution						
Proportion of Households with:						
Agricutural Land = 0	0.03	0.06	0.01	0.01	0.09	0.07
Agricultural Land > 0 & < 0.5	0.19	0.18	0.15	0.10	0.29	0.21
Agricultural Land >0 & < 1.0	0.29	0.24	0.29	0.20	0.26	0.25
Agricultural Land > 1.0	0.50	0.52	0.55	0.69	0.36	0.46
Per Capita Income	3,507	4,516	2,891	2,988	5,277	5,010
Household Size	5.54	4.98	5.83	5.59	4.70	4.78
Sample Size	1128	1872	837	458	291	1414

Source: VHLSS 2002

1) All land variables expressed as hectares per household

2) Household income expressed as '000 VND (2007 Prices)

3) "Sampled Households" are those that were surveyed in the CHVLSS 2007 ("panel")

TABLE 4

Comparisons of Households in 2002 (Panel Sample, Various Dimensions)

	Kontum		CH (Non-Kontum)	
	Non-Minority	**Minority**	**Non-Minority**	**Minority**
Average Household Land				
Annual Land (Ha.)	1.43	1.07	0.31	0.77
Perennial Land (Ha.)	0.55	0.07	0.49	0.47
Agricultural Land (Ha.)	1.97	1.14	0.80	1.23
Forestry Land (Ha.)	0.03	0.75	0.02	0.03
Total Land (Ha.)	2.01	1.89	0.82	1.26
Land Distribution				
Proportion of Households with:				
Annual Land = 0	0.00	0.00	0.44	0.15
Annual Land > 0 & < 0.5	0.04	0.12	0.35	0.27
Annual Land >0 & < 1.0	0.30	0.40	0.10	0.25
Annual Land > 1.0	0.65	0.48	0.11	0.33
Agricutural Land = 0	0.00	0.00	0.10	0.01
Agricultural Land > 0 & < 0.5	0.04	0.11	0.31	0.17
Agricultural Land >0 & < 1.0	0.09	0.39	0.28	0.26
Agricultural Land > 1.0	0.87	0.50	0.31	0.56
Per Capita Measures				
Per Capita Income	5,166	3,145	5,239	2,808
Per Capita Expenditure	4,184	2,533	4,389	2,165
Log PCY	8.48	7.99	8.39	7.81
Log PCX	8.29	7.79	8.27	7.59
Household Income and Composition				
Household Income	24,571	17,177	23,088	15,604
Crop Income	10,655	7,635	8,618	8,684
Sidelines	6,536	6,100	2,285	2,512
Wages	4,720	2,210	5,907	3,178
Family Business	2,488	206	4,534	328
Other Income	-531	590	472	471
Remittances	703	435	1,272	431
Simple Demographics				
Household Size	5.13	5.73	4.67	5.86
Maximum Male Education (>= 15)	6.70	3.68	8.24	4.47
Maximum Female Education (>= 15)	5.09	2.52	7.82	3.37
Main Ethnic Groups (%)				
Xơ Đăng (Sedang)		50%		
Ba Na (Bahnar)		25%		
Giẻ Triêng		23%		
Ngái				32%
Ê Đê (Rhade)				22%
Cờ Ho				16%
N	23	208	267	629

Source: VHLSS 2002

1) Household education is summarized by "maximum male/female education" and measures the years of education of the highest educated (male or female) adult in the household. This is calculated for household members 15 and older. If there is no male or female older than 15, the maximum is calculated as "zero."

2) Income variables are expressed in '000 VND (2007 Prices)

3) Land Distribution based on households with land by size (in Hectares)

TABLE 5A

Provincial Reports of Treatment Rates (Program 132)

Province	Minority HH	"Eligible" HH	HH Received Land	% of Minority Eligible	% of Minority "Treated"	% of "Eligible" Treated	Land Received (Ha.)	Land Received per HH
Kon Tum	34,488	15,678	12,836	45.5	37.2%	81.9%	5,793	0.45
Gia Lai	80,208	16,170	12,596	20.2	15.7%	77.9%	4,083	0.32
Dak Lak	100,353	20,981	8,202	26.3	10.3%	39.1%	4,556	0.56
Dak Nong		2,120	2,120			100.0%	1,283	0.61
Lam Dong	38,700	16,856	7,519	43.6	19.4%	44.6%	5,026	0.67
Total	253,749	71,805	43,273	28.3	17.1%	60.3%	20,741	0.48

Source: Authors' tabulations based on official Provincial Reports of Program 132

1) "Eligibility" is taken as defined in the official reports.

TABLE 5B

Commune Reports of Treatment Rates (Programs 132 and 134)

Province	Number of Communes	Number of households	Number of Ethnic Minority	Number Received 132 Land	Percentage Received 132 Land	Number Received 134 Land	Percentage Received 134 Land	Percentage Received 132 or 134 Land
Kon Tum	10	9,724	6,492	2,400	37.0%	73	1.1%	38.1%
Gia Lai	15	16,488	9,880	1,032	10.4%	201	2.0%	12.5%
Dak Lak	17	42,374	14,412	1,097	7.6%	533	3.7%	11.3%
Lam Dong	8	11,760	6,194	55	0.9%	296	4.8%	5.7%
Total	50	80,346	36,978	4,584	12.4%	1103	3.0%	15.4%

Source: CHVLSS 2007 (Commune Surveys)

1) "Eligibility" is taken as defined by commune officials

TABLE 5C

Commune Reports of Eligibility Thresholds (Amount and Type of Land Used for Determining Household Eligibility)

For Those Communes Implementing Program 132

Province:	Total Number of Communes Implementing 132	Number of communes using Annual Land	Annual Land Threshold (Ha.)	Number of communes using Perennial Land	Perennial Land Threshold (Ha.)	Number of communes using Unused Land	Unused Land Threshold (Ha.)	Average over all types of land (Ha.)
Kon Tum	10	10	0.86	0		0		0.86
Gia Lai	12	7	0.24	1	0.13	4	0.39	0.28
Dak Lak	12	6	0.59	5	0.64	5	0.10	0.61
Lam Dong	1	0		0		1	0.30	0.30
All CH Provinces	35	23	0.60	6	0.56	10	0.24	0.56

Source: CHVLSS 2007 (Commune Surveys)

1) For each type of land, mean thresholds are calculated only over those communes using the land type as the basis for determining eligibility.

TABLE 6

Land Redistributed by Communes Through 132: By Type and Source

		Land Source: 1	2	3	4	Total	
	Type of Land:	**Amount (ha.)**	**Amount (ha.)**	**Amount (ha.)**	**Amount (ha.)**	**Amount (ha.)**	**% of Total**
Kontum:	Annual	644.0	141.5	191.7	0.0	977.3	90.2%
	Perennial	0.0	0.0	0.0	0.0	0.0	0.0%
	Forest	0.0	0.0	0.0	0.0	0.0	0.0%
	Unused	0.0	0.0	106.1	0.0	106.1	9.8%
	Other	0.0	0.0	0.0	0.0	0.0	0.0%
	ALL	644.0	141.5	297.8	0.0	1083.4	100.0%
	% of Total	59.4%	13.1%	27.5%	0.0%	100.0%	
Non-Kontum	Annual	64.3	196.5	74.6	13.1	348.6	53.1%
	Perennial	193.7	5.5	0.0	45.3	244.4	37.2%
	Forest	0.0	0.0	0.0	0.0	0.0	0.0%
	Unused	0.0	6.6	38.7	16.5	61.8	9.4%
	Other	1.9	0.0	0.0	0.0	1.9	0.3%
	ALL	259.9	208.6	113.3	74.9	656.8	100.0%
	% of Total	39.6%	31.8%	17.3%	11.4%	100.0%	

Source: CHVLSS 2007 (Commune Survey)

1) Land Sources:

1 Land transferred from state owned farms and forestry plantations

2 Land from other households with compensation

3 Reclaimed land

4 Other

TABLE 7
"Treatment" Rates by 2002 Land Holdings ("Potential Eligibility")
Household-Level Reports of Program Participation

	Potentially Eligible				"Ineligible"	
Kontum	0	0 to 0.5	0.5 to 1.0	< 1.0	>= 1.0	All
Treat 1: 132 Indicator	0.0%	8.7%	23.2%	20.0%	13.6%	16.8%
Treat 2: 132 or 134 Indicator	0.0%	8.7%	23.2%	20.0%	15.5%	17.8%
Treat 3: 132, 134, or Reclaimed	0.0%	21.7%	40.2%	36.2%	28.2%	32.2%
Land from Treat 1 (Ha.) if Treat 1=1		0.64	0.31	0.34	0.53	0.42
Land from Treat 2 (Ha.) if Treat 2=1		0.64	0.31	0.34	0.49	0.41
Land from Treat 3 (Ha.) if Treat 3=1		0.52	0.36	0.38	0.44	0.41
Land from Treat 1 (Ha.)	0.00	0.06	0.07	0.07	0.07	0.07
Land from Treat 2 (Ha.)	0.00	0.06	0.07	0.07	0.08	0.07
Land from Treat 3 (Ha.)	0.00	0.11	0.15	0.14	0.12	0.13
Sample Size	0	23	82	105	103	208
Proportion of Households	0.0%	11.1%	39.4%	50.5%	49.5%	100.0%

	Potentially Eligible				"Ineligible"	
Non-Kontum Central Highlands	0	0 to 0.5	0.5 to 1.0	< 1.0	>= 1.0	All
Treat 1: 132 Indicator	0.0%	0.0%	1.2%	0.7%	3.1%	2.1%
Treat 2: 132 or 134 Indicator	0.0%	3.8%	4.3%	4.0%	3.4%	3.7%
Treat 3: 132, 134, or Reclaimed	16.7%	7.6%	8.5%	8.4%	11.0%	9.9%
Land from Treat 1 (Ha.) if Treat 1=1			0.30	0.30	0.22	0.24
Land from Treat 2 (Ha.) if Treat 2=1		0.38	0.24	0.29	0.23	0.26
Land from Treat 3 (Ha.) if Treat 3=1	0.30	0.50	0.45	0.46	0.74	0.64
Land from Treat 1 (Ha.)	0.00	0.00	0.00	0.00	0.01	0.00
Land from Treat 2 (Ha.)	0.00	0.01	0.01	0.01	0.01	0.01
Land from Treat 3 (Ha.)	0.05	0.04	0.04	0.04	0.08	0.06
Sample Size	6	105	164	275	354	629
Proportion of Households	1.0%	16.7%	26.1%	43.7%	56.3%	100.0%

Source: VHLSS 2002 and CHVLSS 2007

1) Treatment status is based on household reports from the CHVLSS 2007

2) Land from the program is first reported conditional on positive, then unconditional (including zeroes)

3) Potential Eligibility is based on reported land holdings in 2002 (combined annual plus perennial land)

4) All calculations based on sample of minority households only.

TABLE 8

Exploring Linkages between Potential Eligibility and Reported Treatment Status

	Kontum				Non-Kontum				
	Mean	**Treat 2**	**Treat 2**	**Treat 3**	**Treat 3**	**Mean**	**Treat 2**	**Treat 2**	**Treat 3**	**Treat 3**
Combined Annual and Perennial:										
Total = 0	0.0%					1.0%	0.006		0.169	
							(0.072)		(0.123)	
Total > 0 & < 0.50	11.1%	-0.065		-0.032		16.7%	0.034		0.044	
		(0.095)		(0.116)			(0.022)		(0.038)	
Total >= 0.5 & < 1.0	39.6%	0.053		0.120		26.1%	0.002		-0.011	
		(0.060)		(0.073)			(0.017)		(0.029)	
Annual Land in 2002:										
Annual = 0	0.0%					14.9%		0.014		0.053
								(0.033)		(0.057)
Annual > 0 & < 0.50	12.1%		-0.071		0.000	27.3%		-0.010		-0.018
			(0.093)		(0.113)			(0.023)		(0.040)
Annual >= 0.5 & < 1.0	40.6%		0.061		0.131	25.1%		-0.006		-0.037
			(0.061)		(0.074)			(0.019)		(0.032)
Perennial Land in 2002:										
Perennial = 0	47.8%		0.239		0.237	40.1%		0.040		***0.110***
			(0.250)		(0.304)			(0.027)		(0.046)
Perennial > 0 & < 0.50	48.8%		0.195		0.188	26.7%		0.028		0.055
			(0.257)		(0.312)			(0.025)		(0.043)
Perennial >= 0.5 & < 1.0	1.9%		0.210		0.112	16.2%		-0.024		-0.003
			(0.319)		(0.387)			(0.025)		(0.043)
F-Annual-Categories			1.326		1.889			0.270		1.271
			(0.2681)		(0.1541)			(0.8473)		(0.2834)
F-Perennial-Categories			0.321		0.336			***2.697***		***2.951***
			(0.8101)		(0.7990)			(0.0451)		(0.0322)
F-Total-Categories		1.025		1.872			0.858		1.238	
		(0.3608)		(0.1567)			(0.4627)		(0.2950)	
F Commune Effects		***2.992***	***2.818***	***3.329***	***3.148***		***6.656***	***6.794***	***3.240***	***3.144***
		(0.0030)	(0.0060)	(0.0010)	(0.0020)		(0.0000)	(0.0000)	(0.0000)	(0.0000)

Source: VLSS 2002 and CHVLSS 2007

1) Linear Probability models of for treatment as a function of land holdings in 2002

2) All specifications include household demographics (household size and education in 2002), forest land holdings in 2002, and commune fixed effects

3) Omitted Category (for a given type of land) is households with greater than 1.0 Hectares of Land

4) "Mean" is the proportion of households with land in a given size (potential eligibility) category

5) Standard errors in parentheses for regression coefficients; p-vales in parentheses for F-tests

6) Statistically Significant coefficients highlighted in bold italic (5% level)

7) Sample includes only minority households

TABLE 9

2002 Land Status and 2007 Reported Treatment Rates by 2002 PCY Quartile

	Kontum				Non-Kontum CH			
	Q1	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Per Capita Household Income	1,712	2,148	3,112	4,304	1,400	2,278	2,938	5,178
Annual Land (Ha.)	1.01	0.89	1.07	1.19	0.70	0.77	0.66	0.97
Perennial Land (Ha.)	0.05	0.09	0.06	0.07	0.25	0.32	0.67	0.71
Total Agricultural Land (Ha.)	1.06	0.99	1.14	1.26	0.95	1.09	1.33	1.68
Land Distribution Measures								
Agricutural Land = 0	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	1.4%	0.7%
Agricultural Land > 0 & < 0.5	18.5%	4.5%	10.9%	12.3%	21.4%	17.0%	14.5%	12.4%
Agricultural Land >0 & < 1.0	37.0%	68.2%	34.4%	27.4%	33.0%	27.9%	24.1%	16.8%
Agricultural Land > 1.0	44.4%	27.3%	54.7%	60.3%	45.6%	53.3%	60.0%	70.1%
Treat 1: 132 Indicator	11.1%	20.5%	25.0%	9.6%	2.2%	0.0%	4.8%	1.5%
Treat 2: 132 or 134 Indicator	11.1%	20.5%	26.6%	11.0%	3.8%	3.0%	6.2%	1.5%
Treat 3: 132, 134, or Reclaimed	18.5%	34.1%	46.9%	23.3%	10.4%	10.9%	11.0%	6.6%
Land from Treat 1 (Ha.)	0.03	0.07	0.10	0.06	0.00	0.00	0.01	0.01
Land from Treat 2 (Ha.)	0.03	0.07	0.10	0.06	0.01	0.01	0.02	0.01
Land from Treat 3 (Ha.)	0.05	0.15	0.19	0.10	0.07	0.06	0.09	0.02
Sample Size	27	44	64	73	182	165	145	137
Proportion of Households	13.0%	21.2%	30.8%	35.1%	28.9%	26.2%	23.1%	21.8%

Source: VHLSS 2002 and CHVLSS 2007

1) This table reports means for 2002 and 2007 outcomes by per capita income quartiles (calculated on the basis of 2002 PCY)

2) The PCY Quartiles are calculated over the entire CH (Minority households only)

3) All statistics calculated over minority households only

TABLE 10

Land Outcomes: 2002 versus 2007 (VHLSS and CHVLSS)

	All Central Highlands				Minority Only			
	Kinh		Minority		Kontum		Non-Kontum	
	2002	2007	2002	2007	2002	2007	2002	2007
Average Annual Land	0.40	0.30	0.84	1.02	1.07	1.15	0.77	0.98
Average Perennial Land	0.49	0.67	0.37	0.45	0.07	0.17	0.47	0.54
Average Agricultural Land	0.89	0.97	1.21	1.47	1.14	1.32	1.23	1.52
Average Forestry Land	0.02	0.01	0.21	0.03	0.75	0.00	0.03	0.03
CDF of households:								
Total = 0	9.0%	18.6%	0.7%	2.3%	0.0%	0.5%	1.0%	2.9%
Total < 0.5 Ha.	38.3%	37.2%	16.0%	15.5%	11.1%	14.9%	17.6%	15.7%
Total < 1.0 Ha.	64.5%	60.3%	45.4%	38.8%	50.5%	43.3%	43.7%	37.4%

Source: VHLSS 2002 and CHVLSS 2007

1) Land variables are expressed as average hectares per household

2) The CDF is the "Cumulative Distribution Function", i.e., the cumulative percentage of households with land below the stated cutoff

TABLE 11

Increases in Land 2003-2007: Major Sources by Household

	All CH		Kontum		Non-Kontum	
	Kinh	**Minority**	**Kinh**	**Minority**	**Kinh**	**Minority**
Percentage of Households with Increases since 2003	25.2	28.9	37.0	44.2	24.1	24.0
Percentage with new land:						
From the State	3.4	4.8	11.1	14.3	2.7	1.7
From 132	0.0	4.8	0.0	16.5	0.0	2.3
From 134	0.0	5.7	0.0	0.9	0.0	1.7
Inherit	1.2	1.5	3.7	2.7	1.0	5.3
Buy	12.6	4.5	14.8	0.4	12.4	5.9
Reclaim	1.8	9.4	0.0	17.0	2.0	7.0
Other	8.9	4.0	14.8	3.1	8.4	4.3

Source: CHVLSS 2007

1) All values are precentages of households

2) Based on questions in the 2007 survey pertaining to sources of household increases in land holdings

TABLE 12

Land Outcomes: 2001 versus 2006 (Agricultural Census)

	All Central Highlands				Minority Only			
	Kinh		Minority		Kontum		Non-Kontum	
	2001	**2006**	**2001**	**2006**	**2001**	**2006**	**2001**	**2006**
Total Population	2,257,721	2,303,126	1,397,797	1,602,755	176,930	202,053	1,220,867	1,400,702
Number of Households	493,026	529,790	253,821	309,591	34,488	41,027	219,333	268,564
Average Household Size	4.58	4.35	5.51	5.18	5.13	4.92	5.57	5.22
Average Annual Land	0.30	0.35	0.70	0.86	0.92	1.13	0.66	0.82
Average Perennial Land	0.69	0.78	0.42	0.48	0.12	0.11	0.47	0.53
Average Agricultural Land	1.00	1.14	1.14	1.34	1.05	1.24	1.15	1.35
Average Forestry Land	0.04	0.03	0.60	0.63	1.28	1.37	0.49	0.52
CDF of households:								
Agricultural Land = 0	0.0%	9.3%	0.0%	1.7%	0.0%	2.0%	0.0%	1.6%
Agricultural Land < 0.5 Ha.	21.5%	32.3%	11.3%	20.6%	20.9%	21.7%	9.8%	20.4%
Agricultural Land < 1.0 Ha.	74.9%	78.1%	65.1%	65.2%	76.5%	67.3%	63.4%	64.9%

Source: Authors calculations based on GSO tabulations of the 2001 and 2006 Agricultural Censuses

1) All land measures are reported as average hectares per household

2) The CDF is the cumulative percentage of households with land below the relevant "cutoff" (e.g., land below 0.5 Ha).

TABLE 13

Income Changes, 2002-2007 (Panel Households)

	All Central Highlands				Minority Only			
	Kinh		Minority		Kontum		Non-Kontum	
	2002	2007	2002	2007	2002	2007	2002	2007
Per Capita Income	5,233	11,666	2,891	4,913	3,145	2,959	2,808	5,559
Per Capita Expenditure	4,370	7,574	2,230	3,252	2,533	2,315	2,165	3,562
Log PCY	8.40	9.13	7.85	8.24	7.99	7.87	7.81	8.36
Log PCX	8.27	8.81	7.62	7.96	7.79	7.67	7.59	8.05
Household Income	23,206	48,805	15,995	26,195	17,177	15,968	15,604	29,577
Crop Income	8,780	27,791	8,424	17,301	7,635	9,845	8,684	19,766
Sidelines	2,623	2,072	3,403	2,106	6,100	1,282	2,512	2,378
Wages	5,812	8,640	2,937	4,543	2,210	3,154	3,178	5,002
Family Business	4,371	7,225	298	313	206	184	328	356
Other Income	392	1,283	501	1,028	590	1,138	471	992
Remittances	1,227	1,794	432	904	435	365	431	1,083

Source: VHLSS 2002 and CHVLSS 2007 (Panel Households)

1) All values are expressed in constant '000 VND (2007 prices)

TABLE 14

How much crop income can be derived from a hectare of land?

OLS Regressions: Various Specifications

	(1)	(2)	(3)	(4)
Output Measure:	**2002 Level**	**2007 Level**	**Change**	**Change**
Land Measure:	**2002 Level**	**2007 Level**	**2002 Level**	**Change**
Minority Indicator	-996	1,137	-1,511	***-7,669***
	(1017)	(2857)	(3593)	(2905)
Base Land:				
Annual Land (Ha.)	***5,549***	***9,243***	829	***8,825***
	(822)	(1304)	(2905)	(1534)
Perennial Land (Ha.)	***6,076***	***31,059***	***18,877***	***15,779***
	(662)	(1886)	(2340)	(2412)
Interactions:				
Minority X Annual Land	***-3,121***	***-5,041***	376	***-6,728***
	(843)	(1555)	(2981)	(1768)
Minority X Perennial Land	48	***-16,758***	***-17,266***	***-7,439***
	(779)	(2172)	(2755)	(2648)
Kontum X Annual Land	1,270	-465	-4,687	3,012
	(828)	(2104)	(2927)	(2303)
Kontum X Perennial Land	***-3,996***	***-11,293***	2,304	-4,553
	(1979)	(2985)	(6994)	(3135)
Combined Effects:				
Minority Annual	***2,428***	***4,202***	1,205	***2,097***
	(379)	(1000)	(1340)	(944)
Minority Perennial	***6,124***	***14,301***	1,611	***8,339***
	(482)	(1411)	(1704)	(1415)
Kontum Annual	***6,819***	***8,778***	-3,858	***11,837***
	(1022)	(2350)	(3611)	(2662)
Kontum Perennial	2,080	***19,767***	***21,181***	***11,225***
	(1977)	(2999)	(6988)	(3265)

Source: VHLSS 2002 and CHVLSS 2007 (Panel)

1) Each column represents a regression of crop income on land holdings (annual and perennial).

2) For crop income: specifications include the 2002 level, 2007 level, and the change between 2007 amd 2002

3) Land holdings are measured as either: the 2002 level, the 2007 level, or the change between 2002 and 2007

4) All specifications include controls for commune fixed effects, household size, and education

5) Standard errors in parentheses, and statistically significant coefficients (5%) in bold italics.

6) The Combined effects are the sum of the base land coefficient, plus the relevant interaction term.

TABLE 15

Cross-Tabulation of Treatment Status and Selected Outcomes

	Treatment measure: Treat 2				Treatment measure: Treat 3			
	Kontum		Non-Kontum		Kontum		Non-Kontum	
	Treat 2 = 0	Treat 2 = 1	Treat 2 = 0	Treat 2 = 1	Treat 3 = 0	Treat 3 = 1	Treat 3 = 0	Treat 3 = 1
Changes (2007 minus 2002) in:								
Annual Land	0.04	0.28	0.23	-0.12	0.04	0.17	0.19	0.42
Perennial Land	0.11	0.10	0.06	0.28	0.11	0.09	0.06	0.16
Total Agric Land	0.14	0.38	0.29	0.17	0.15	0.26	0.26	0.58
Household Income	-1,841	1,250	12,945	4,955	-2,123	449	13,161	8,013
Crop Income	1,475	5,079	10,323	7,299	936	4,592	10,620	6,488
Sideline Income	-4,717	-5,270	-62	-2,235	-4,448	-5,592	-183	238
PCY	-288.5	112.0	2,556.1	730.9	-278.5	-91.4	2,604.7	1,436.2
PCX	0.5	-55.4	1,493.6	666.8	11.6	-78.4	1,485.3	1,233.4
Ln PCY	-0.14	-0.08	0.56	0.19	-0.14	-0.11	0.56	0.36
Ln PCX	-0.03	-0.07	0.50	0.35	-0.03	-0.08	0.50	0.48

Source: VHLSS 2002 and CHVLSS 2007

1) "Treat 2" is the treatment measure corresponding to specific reports of participation in Program 132 or 134

2) "Treat 3" is treatment status corresponding to "Treat 2" plus households reporting "Reclaimed Land"

3) Outcome measures are calculated for panel households, and correspond to changes in variables between 2007 and 2002

4) All income-based variables reported in '000 VND (Constant 2007 Prices)

5) Land variables reported in Hectares

6) All statistics calculated over minority households only

TABLE 16

Estimated Treatment Effects: Various Outcomes and Different Treatment Measures

Kontum:	**Annual Land**		**Perennial Land**		**Total Land**		**Household Income**		**Crop Income**		**Sideline Income**	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Treat 2: 132 or 134 Indicator	0.27	0.29	-0.04	0.05	0.23	0.34	***2729.86***	***2955.26***	***2810.15***	***3353.85***	-686.54	-696.38
	(0.17)	(0.20)	(0.13)	(0.12)	(0.17)	(0.22)	(1,163)	(1,205)	(1,184)	(1,624)	(761)	(852)
Land from Treat 2	***0.40***	***0.38***	***-0.28***	-0.14	0.12	0.24	146.97	-534.58	1322.49	1459.67	-523.69	-494.11
	(0.16)	(0.15)	(0.12)	(0.08)	(0.16)	(0.16)	(2,017)	(2,143)	(1,691)	(1,544)	(867)	(849)
Treat 3: 132, 134, or Reclaimed	0.23	0.19	-0.05	-0.02	0.18	0.17	***2714.68***	1963.27	***3194.96***	***2649.63***	-810.54	-894.74
	(0.13)	(0.16)	(0.13)	(0.13)	(0.17)	(0.18)	(1,261)	(1,155)	(1,178)	(1,126)	(442)	(473)
Land from Treat 3	***0.52***	***0.54***	-0.05	-0.01	0.47	0.54	2080.49	1158.08	3093.07	2533.58	-458.89	-408.33
	(0.19)	(0.21)	(0.22)	(0.22)	(0.36)	(0.37)	(2,679)	(3,049)	(2,436)	(2,639)	(560)	(505)
CH Outside Kontum:	**Annual Land**		**Perennial Land**		**Total Land**		**Household Income**		**Crop Income**		**Sideline Income**	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Treat 2: 132 or 134 Indicator	-0.21	-0.29	0.09	0.12	-0.12	-0.18	-4232.59	-910.24	-983.94	1403.87	***-1578.27***	-436.64
	(0.17)	(0.19)	(0.19)	(0.21)	(0.25)	(0.26)	(2,577)	(3,637)	(3,296)	(4,968)	(539)	(726)
Land from Treat 2	-0.70	-0.89	0.79	0.78	0.08	-0.12	-5881.24	-2076.64	5440.86	7430.72	-2468.99	-484.86
	(0.50)	(0.46)	(0.57)	(0.59)	(0.64)	(0.63)	(6,029)	(5,645)	(6,169)	(7,373)	(2,001)	(1,673)
Treat 3: 132, 134, or Reclaimed	0.12	0.14	0.01	-0.02	0.13	0.12	-594.76	278.23	-458.63	-373.33	600.95	1273.47
	(0.12)	(0.14)	(0.08)	(0.10)	(0.17)	(0.20)	(1,776)	(2,048)	(1,718)	(2,221)	(734)	(809)
Land from Treat 3	***0.40***	***0.41***	0.04	0.02	***0.44***	***0.43***	628.42	915.53	320.34	351.10	***1099.98***	***1287.05***
	(0.15)	(0.16)	(0.05)	(0.06)	(0.18)	(0.19)	(895)	(1,033)	(1,023)	(1,131)	(502)	(474)

Source: VHLSS 2002 and CHVLSS 2007 (Panel), Minority Households Only

1) Each reported coefficient is the regression coefficient on a measure of treatment status from a regression of a change in household outcomes on treatment status, and covariates.

2) All specifications include commune fixed effects, flexible controls for household land endowments in 2002, household size and education in 2002, and log pcy in 2002

3) Column (1) is estimated treatment effect using all minority observations; Column (2) (shaded) uses the 75% closest "matches" in the control group.

4) Standard Errors in parentheses, and statistically significant coefficients (5%) in bold italic.

TABLE 17
Program 134 Housing Treatment Status, and other Outcomes
By Quartile of Value of Housing in 2002

	Quartile: Value of Minority Housing in 2002			
	1	2	3	4
Average Size of Home in 2002 (square metres)	30.0	37.3	46.7	58.5
Average Value of Home in 2002 ('000 VND)	2,275	6,064	12,499	32,095
Percentage that Constructed New Home	50.5%	31.8%	19.2%	13.7%
Percentage that Received Support	43.5%	21.5%	10.1%	7.1%
Percentage of those that Built that Received Support	86.1%	67.6%	52.6%	51.8%
Average Value of 134 Housing Support ('000 VND)	6,985	5,793	5,979	5,866
Percentage without water from tap or well	69.6%	70.0%	61.6%	46.7%
Percentage that Received Support for Water	25.0%	4.7%	7.2%	4.7%
Percentage without a well or tap water that Received Support	33.6%	5.5%	7.0%	2.0%
Average Value of 134 Support for Water ('000 VND)	113	227	440	1,020
Percentage of Total Support Going to the Quartile	51.88%	26.91%	12.15%	9.05%

Source: VHLSS 2002 and CHVLSS 2007

TABLE 18
Program 134 Housing Treatment Status, and other Outcomes
By Quartile of Per Capita Income (2002)

	Quartile: Minority Income in 2002			
	1	2	3	4
Percentage that Received Land from 132 or 134	4.8%	6.7%	12.4%	4.8%
Average Size of Home in 2002 (M2)	32.0	30.3	31.9	34.8
Average Value of Home in 2002 ('000 VND)	5371	6291	7441	9589
Percentage that Constructed New Home	29.2%	35.4%	24.9%	23.3%
Percentage that Received Support	23.4%	26.8%	16.3%	12.6%
Percentage of those that Built that Received Support	80.1%	75.7%	65.2%	55.1%
Average Value of 134 Support ('000 VND)	6519	6220	6970	5812
Percentage that Received Support for Water	9.6%	13.4%	7.7%	8.6%
Average Value of Support for Water ('000 VND)	495	225	219	267
Percentage of Total Support Going to the Quartile	30%	33%	22%	15%

Source: VHLSS 2002 and CHVLSS 2007

APPENDIX TABLE 1A

Predicting Treatment at the Household Level: OLS Estimates (with and without commune dummies)

KONTUM	Treat 1		Treat 2		Treat 3		Land Treat 1		Land Treat 2		Land Treat 3	
Commune Survey Rate (132/4)	-0.018		-0.017		0.150		-0.036		-0.042		-0.138	
	(0.240)		(0.238)		(0.421)		(0.166)		(0.164)		(0.218)	
Log Per Capita Income (2002)	-0.072	-0.208	-0.051	-0.203	-0.056	-0.184	-0.008	-0.089	0.003	-0.083	0.009	-0.082
	(0.089)	(0.106)	(0.097)	(0.108)	(0.087)	(0.132)	(0.043)	(0.061)	(0.044)	(0.061)	(0.063)	(0.084)
F-Annual-Categories	2.73	1.41	2.58	1.23	2.72	1.37	0.26	0.08	0.32	0.19	0.68	0.12
	(0.125)	(0.247)	(0.136)	(0.294)	(0.126)	(0.256)	(0.778)	(0.922)	(0.734)	(0.831)	(0.532)	(0.889)
F-Perennial-Categories	***5.81***	0.43	***5.71***	0.49	***8.09***	0.37	2.28	1.11	2.94	1.02	***4.85***	0.54
	(0.021)	(0.732)	(0.022)	(0.692)	(0.008)	(0.774)	(0.156)	(0.344)	(0.099)	(0.385)	(0.033)	(0.653)
F-Forestry-Land	0.10	0.75	0.07	0.69	0.23	0.19	0.66	0.28	1.07	0.26	0.33	0.14
	(0.909)	(0.474)	(0.934)	(0.502)	(0.803)	(0.828)	(0.545)	(0.757)	(0.388)	(0.770)	(0.725)	(0.868)
F-All-Land	***7.29***	0.83	***8.32***	0.78	***74.62***	0.67	***15.22***	0.52	***10.80***	0.50	***61.01***	0.28
	(0.006)	(0.561)	(0.004)	(0.606)	(0.000)	(0.701)	(0.000)	(0.817)	(0.002)	(0.830)	(0.000)	(0.962)
F-All Household-Vars	0.28	1.95	0.23	1.89	0.72	0.66	1.33	1.53	1.41	1.44	0.52	0.75
	(0.886)	(0.104)	(0.915)	(0.115)	(0.600)	(0.619)	(0.339)	(0.195)	(0.314)	(0.221)	(0.721)	(0.557)
F-Commune Effects		***2.93***		***3.25***		***3.40***		***3.97***		***3.98***		***2.98***
		(0.004)		(0.002)		(0.001)		(0.000)		(0.000)		(0.004)

Source: VHLSS 2002 and CHVLSS 2007

1) This table reports coefficients and/or F-statistics from a regression of treatment status on household characteristics, and commune variables.

2) Commune survey rate is the commune reported treatment rate for 132/134

3) The shaded column reports results from a specification with commune dummies.

4) Household variables include land indicators for land size (annual and perennial land in 2002), as well as log PCY in 2002, and household size and education levels.

5) For coefficients, standard errors in parentheses. For F-statistics, p-values in parentheses. Statistically significant results (5%) in bold italic

APPENDIX TABLE 1B

Predicting Treatment at the Household Level: OLS Estimates (with and without commune dummies)

CH OUTSIDE KONTUM	Treat 1		Treat 2		Treat 3		Land Treat 1		Land Treat 2		Land Treat 3	
Commune Survey Rate (132/4)	-0.077		-0.001		-0.064		-0.007		0.033		-0.040	
	(0.084)		(0.103)		(0.115)		(0.012)		(0.020)		(0.073)	
Log Per Capita Income (2002)	-0.005	0.006	0.001	0.021	-0.007	0.061	0.007	***0.011***	0.013	***0.021***	-0.006	0.037
	(0.021)	(0.014)	(0.021)	(0.019)	(0.023)	(0.032)	(0.008)	(0.005)	(0.009)	(0.007)	(0.030)	(0.033)
F-Annual-Categories	0.79	2.08	0.18	0.26	1.68	1.13	0.88	1.19	0.30	0.51	***3.04***	0.59
	(0.510)	(0.102)	(0.910)	(0.854)	(0.191)	(0.338)	(0.460)	(0.312)	(0.822)	(0.674)	(0.043)	(0.621)
F-Perennial-Categories	0.46	1.50	0.93	***3.05***	1.62	***3.85***	0.16	1.45	0.91	2.44	2.42	2.24
	(0.713)	(0.214)	(0.439)	(0.028)	(0.205)	(0.010)	(0.924)	(0.229)	(0.448)	(0.063)	(0.084)	(0.082)
F-Forestry-Land	1.14	0.01	***8.05***	***9.84***	***112.92***	***5.70***	1.40	0.05	***5.83***	2.73	***8.91***	0.73
	(0.332)	(0.989)	(0.001)	(0.000)	(0.000)	(0.004)	(0.262)	(0.950)	(0.007)	(0.066)	(0.001)	(0.481)
F-All-Land	0.47	1.37	***3.49***	***3.63***	***39.83***	***3.23***	0.50	1.04	2.23	1.76	***18.43***	1.25
	(0.870)	(0.205)	(0.005)	(0.000)	(0.000)	(0.001)	(0.845)	(0.407)	(0.052)	(0.082)	(0.000)	(0.270)
F-All Household-Vars	0.79	1.97	1.69	1.51	0.88	***2.42***	0.52	2.11	1.01	***2.96***	1.57	1.94
	(0.541)	(0.098)	(0.177)	(0.196)	(0.485)	(0.048)	(0.719)	(0.078)	(0.418)	(0.019)	(0.207)	(0.103)
F-Commune Effects		***7.49***		***6.83***		***3.27***		***3.36***		***3.18***		1.24
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.169)

Source: VHLSS 2002 and CHVLSS 2007

1) This table reports coefficients and/or F-statistics from a regression of treatment status on household characteristics, and commune variables.

2) Commune survey rate is the commune reported treatment rate for 132/134

3) The shaded column reports results from a specification with commune dummies.

4) Household variables include land indicators for land size (annual and perennial land in 2002), as well as log PCY in 2002, and household size and education levels.

5) For coefficients, standard errors in parentheses. For F-statistics, p-values in parentheses. Statistically significant results (5%) in bold italic

APPENDIX TABLE 2

Estimated Treatment Effects: Various Outcomes and Different Treatment Measures

Kontum:	**PCY**		**PCX**		**Ln PCY**		**Ln PCX**	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Treat 2: 132 or 134 Indicator	387.83	***507.94***	9.47	100.88	0.06	0.09	0.00	0.03
	(201)	(191)	(282)	(239)	(0.04)	(0.06)	(0.08)	(0.06)
Land from Treat 2	179.62	210.51	211.35	93.48	0.08	0.11	0.09	0.02
	(587)	(682)	(224)	(225)	(0.18)	(0.20)	(0.10)	(0.08)
Treat 3: 132, 134, or Reclaimed	325.46	206.05	141.15	***398.23***	0.09	0.07	0.06	***0.15***
	(296)	(230)	(206)	(197)	(0.08)	(0.06)	(0.05)	(0.07)
Land from Treat 3	451.83	292.70	704.97	783.29	0.13	0.10	0.20	0.25
	(535)	(540)	(582)	(650)	(0.13)	(0.13)	(0.17)	(0.19)
CH Outside Kontum:	**PCY**		**PCX**		**Ln PCY**		**Ln PCX**	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Treat 2: 132 or 134 Indicator	-766.98	-251.18	***-553.11***	***-614.14***	-0.20	-0.12	-0.13	-0.19
	(411)	(516)	(255)	(252)	(0.11)	(0.15)	(0.10)	(0.10)
Land from Treat 2	-1611.86	-1182.53	-2017.78	-1762.08	-0.21	-0.10	-0.38	-0.45
	(1,621)	(1,728)	(1,204)	(1,358)	(0.35)	(0.34)	(0.42)	(0.49)
Treat 3: 132, 134, or Reclaimed	-171.81	38.35	-28.70	193.27	-0.06	-0.01	0.00	0.04
	(367)	(413)	(301)	(328)	(0.08)	(0.09)	(0.07)	(0.08)
Land from Treat 3	168.13	206.96	***375.51***	***442.11***	0.05	0.06	***0.15***	***0.17***
	(207)	(203)	(172)	(123)	(0.04)	(0.04)	(0.05)	(0.04)

Source: VHLSS 2002 and CHVLSS 2007 (Panel), Minority Households Only

1) Each reported coefficient is the regression coefficient on a measure of treatment status from a regression of a change in household outcomes on treatment status, and covariates.

2) All specifications include commune fixed effects, flexible controls for household land endowments in 2002, household size and education in 2002, and log pcy in 2002

3) Column (1) is estimated treatment effect using all minority observations; Column (2) (shaded) uses the 75% closest "matches" in the control group.

4) Standard Errors in parentheses, and statistically significant coefficients (5%) in bold italic.

FIGURE 1
Sampled Districts, CHVLSS 2007

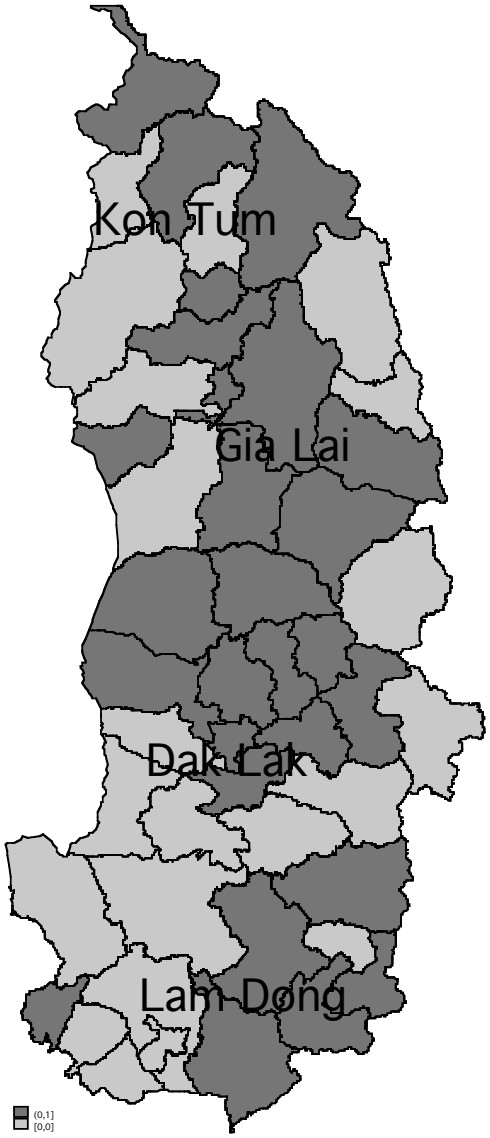
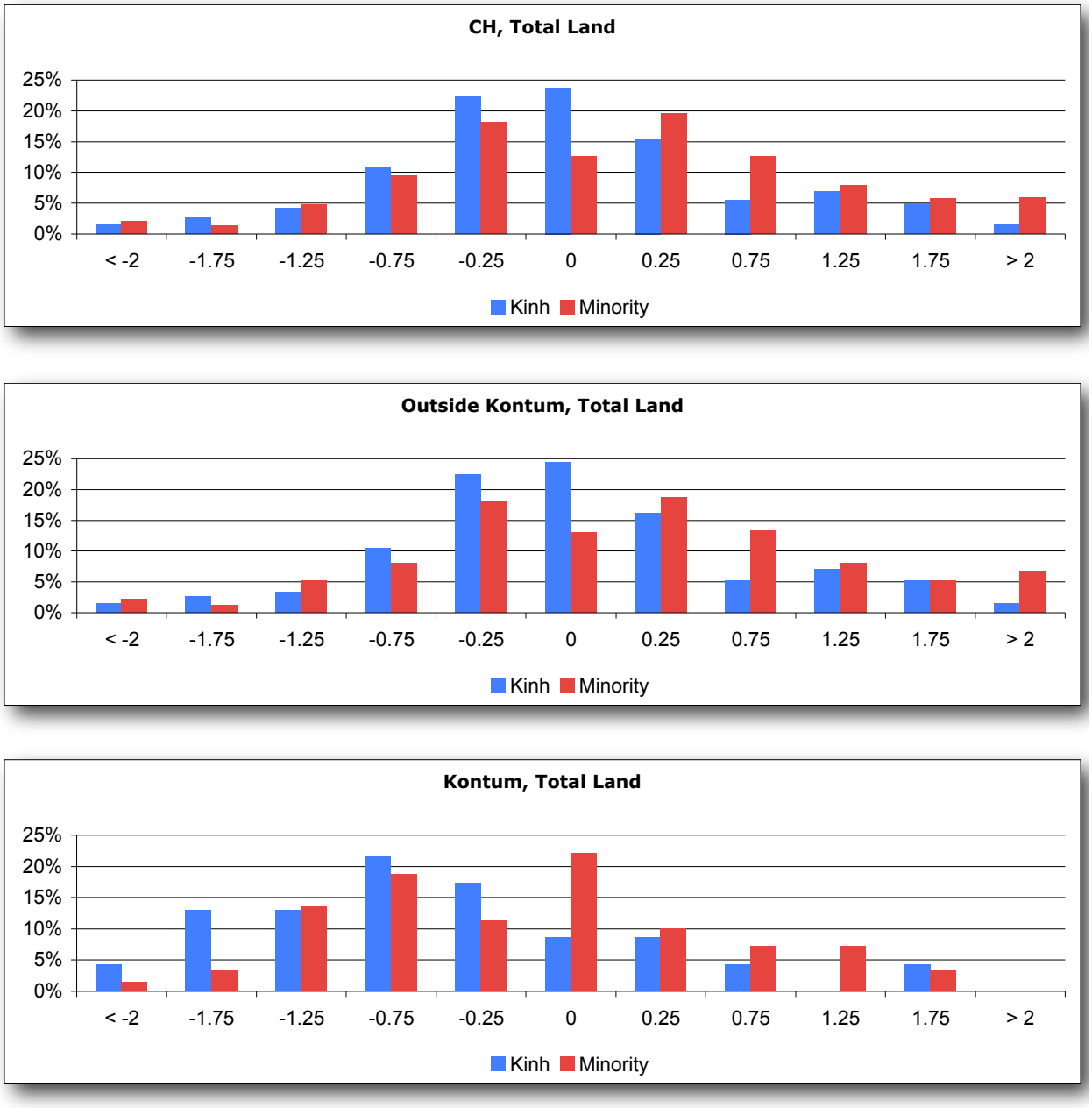
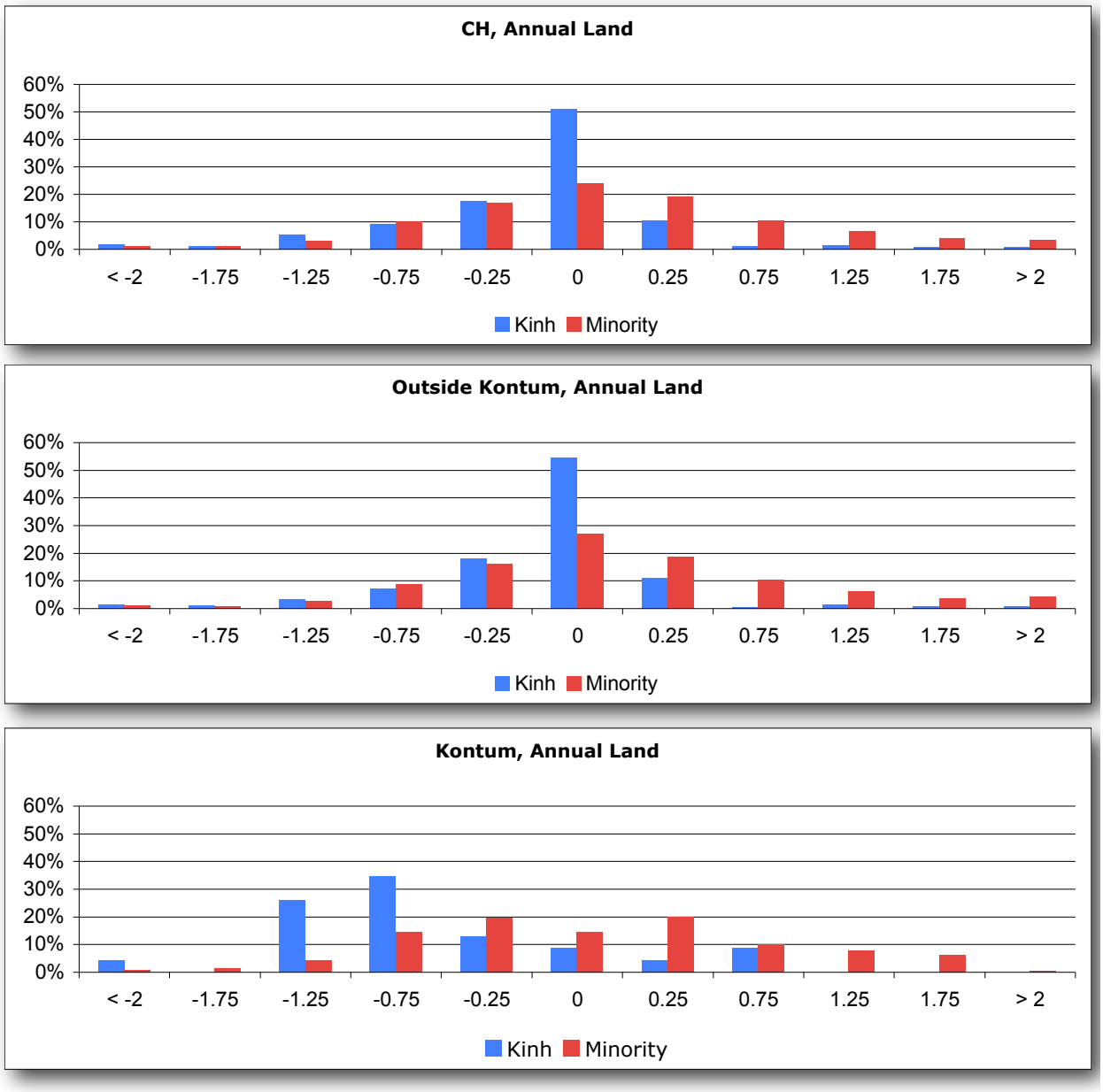


Figure 2
Changes in Household Land Holdings, 2002 to 2007



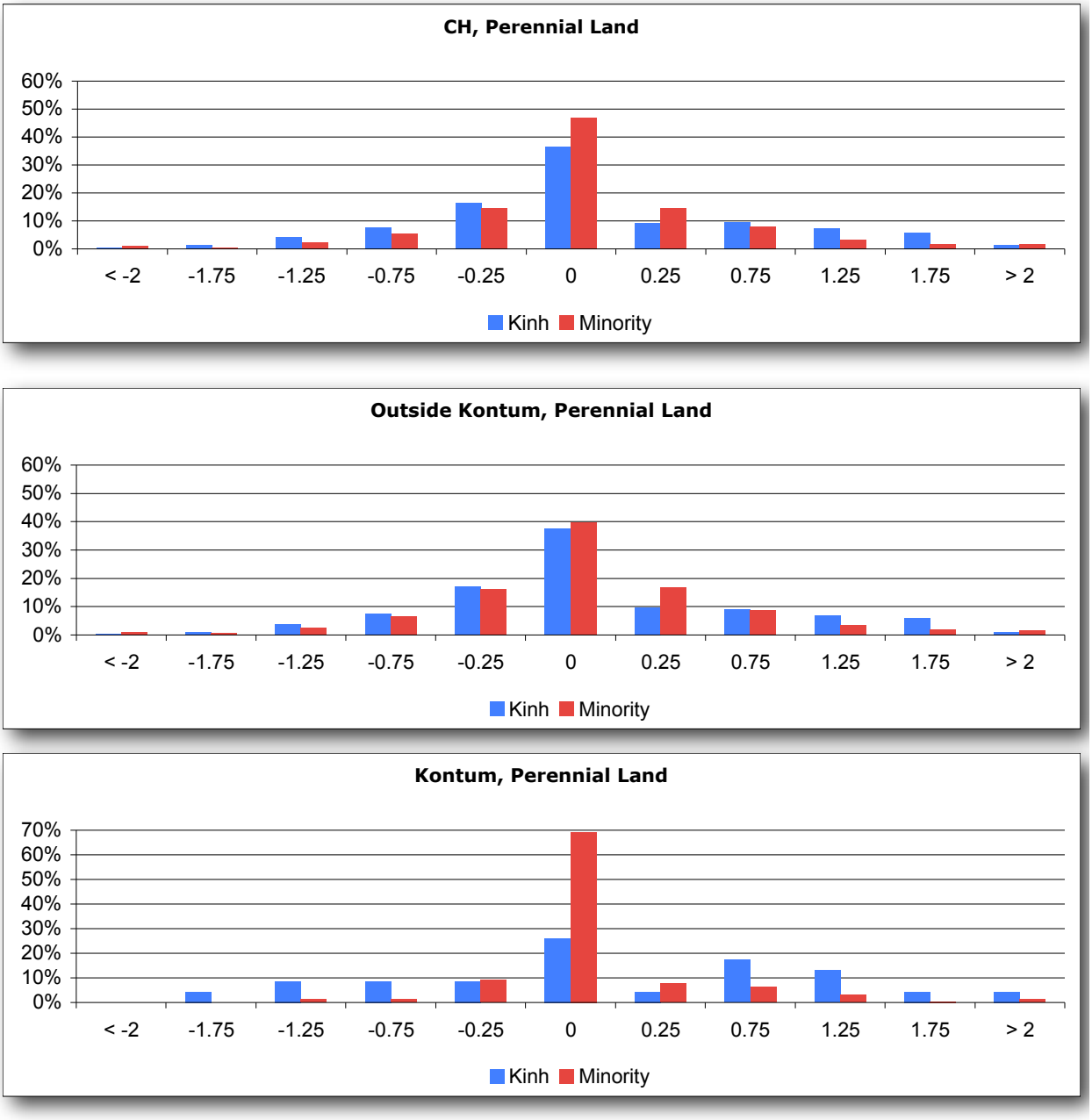
Source: VHLSS 2002 and CHVLSS 2007 (Panel)
1) This figure shows the percentage of households with changes of total land holdings (annual + perennial) between 2002 and 2007 of different magnitudes.

Figure 3
Changes in Household Annual Land Holdings, 2002 to 2007



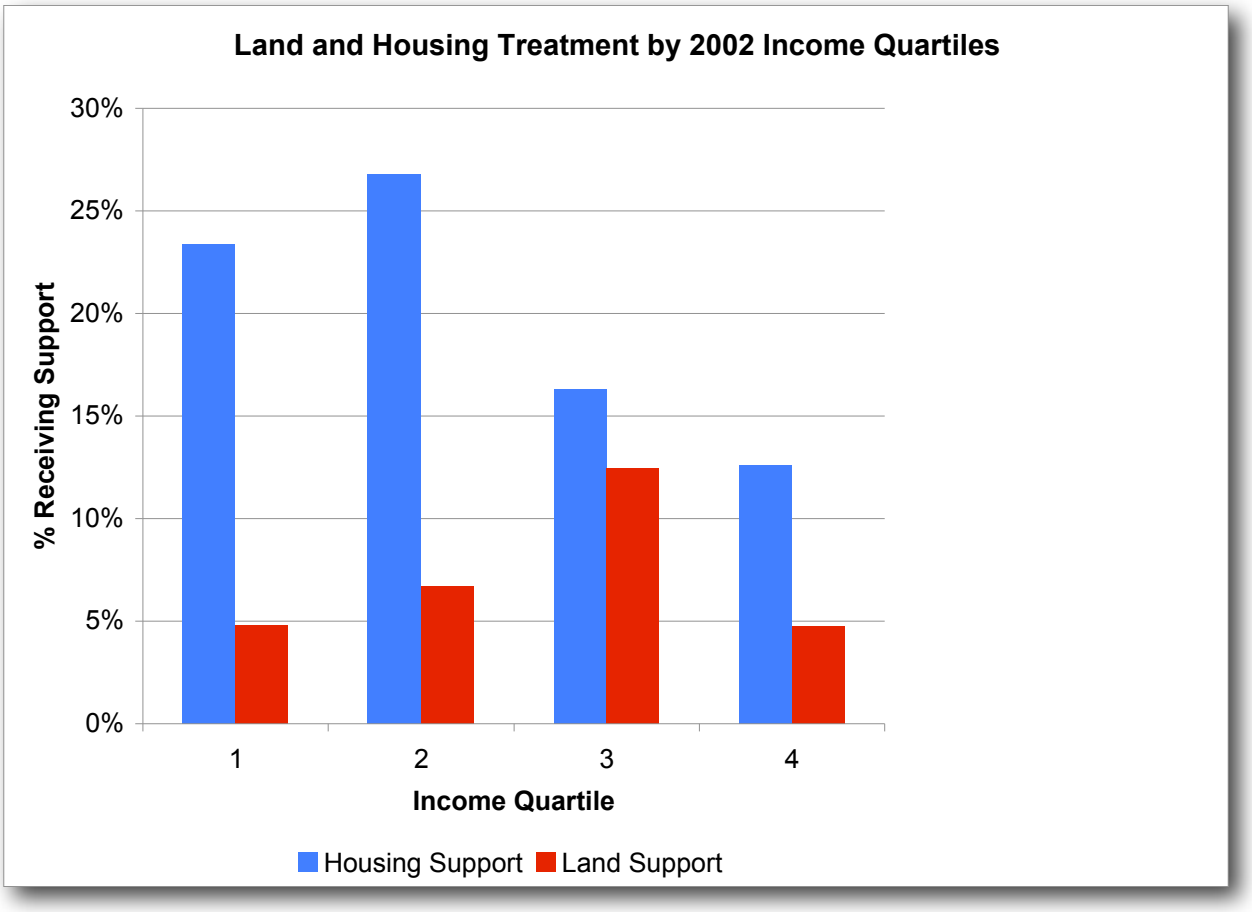
Source: VHLSS 2002 and CHVLSS 2007 (Panel)
1) This figure shows the percentage of households with changes of annual land holdings between 2002 and 2007 of different magnitudes.

Figure 4
Changes in Household Perennial Land Holdings, 2002 to 2007



Source: VHLSS 2002 and CHVLSS 2007 (Panel)
1) This figure shows the percentage of households with changes of perennial land holdings between 2002 and 2007 of different magnitudes.

Figure 5
Evaluating the "Progressivity" of Programs 132 and 134



Source: VHLSS 2002 and CHVLSS 2007 (Panel)
1) This figure shows the treatment rates for the land (132/134) and housing (134) programs by 2002 per capita income decile.
2) Based on results reported in Tables 9 and 18