Utilization of Soil Conservation Practices in Central Haiti

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SANREM Study Area

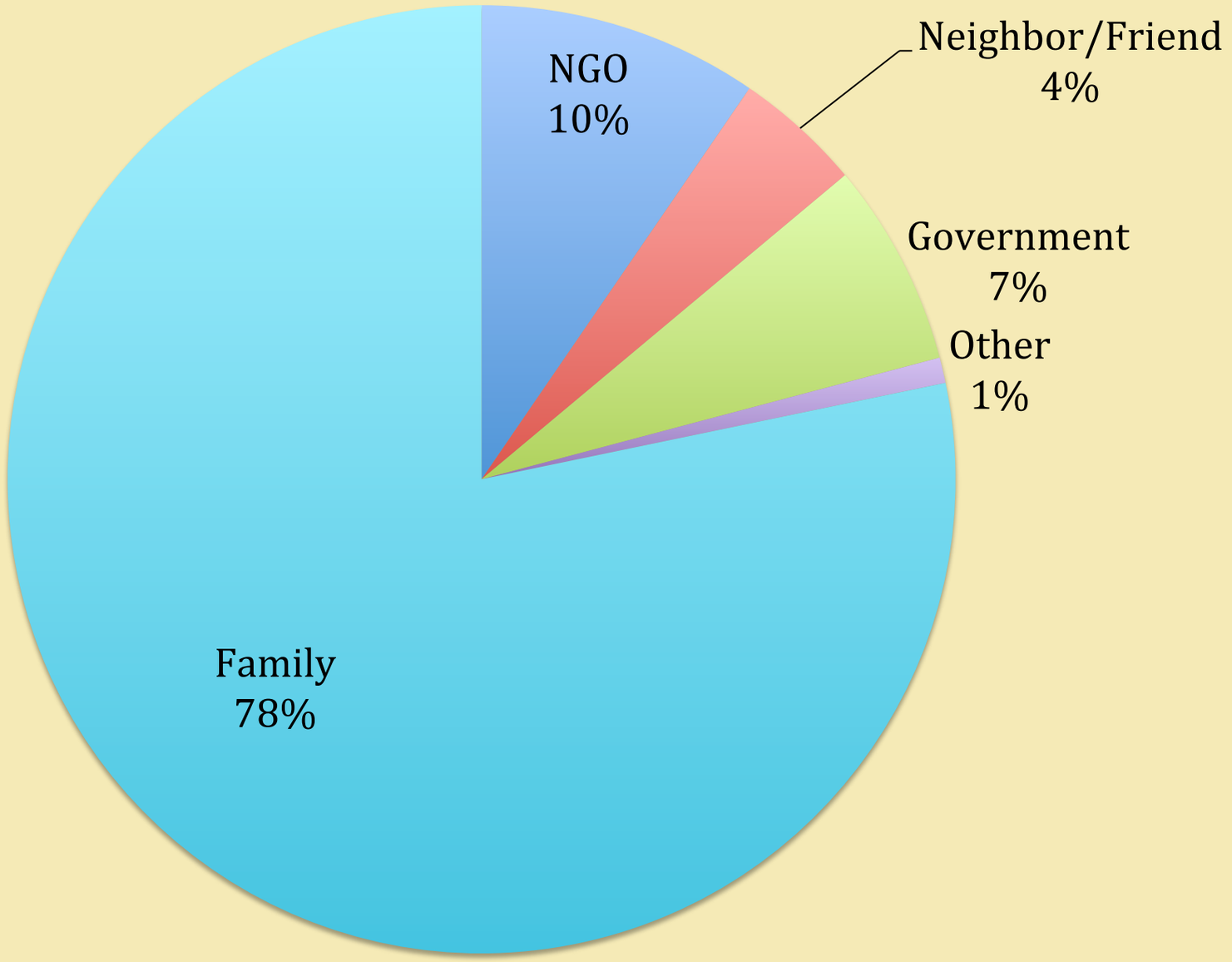
Natural Resource Degradation in Haiti

Common Agricultural Practices

Characteristics of Agricultural Production

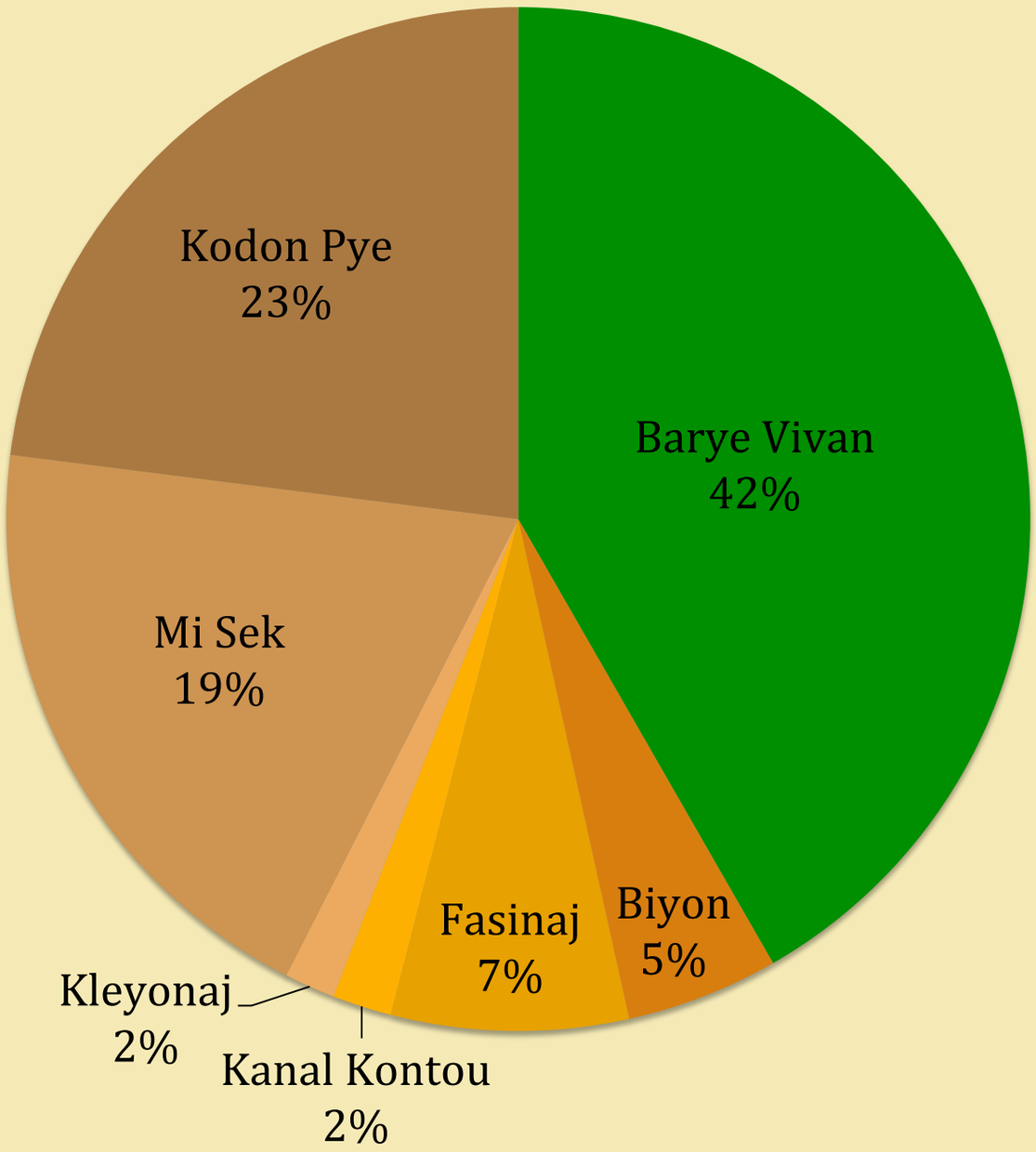
- Low input
- Hillside agriculture and degraded soils
- Mixed production systems with relatively small farms
- Thick labor, input, and output markets
- Low productivity/output
- Some long-term utilization of soil conservation practices

Soil Conservation Practices



Source of Soil Conservation Practice

Soil Conservation Practices



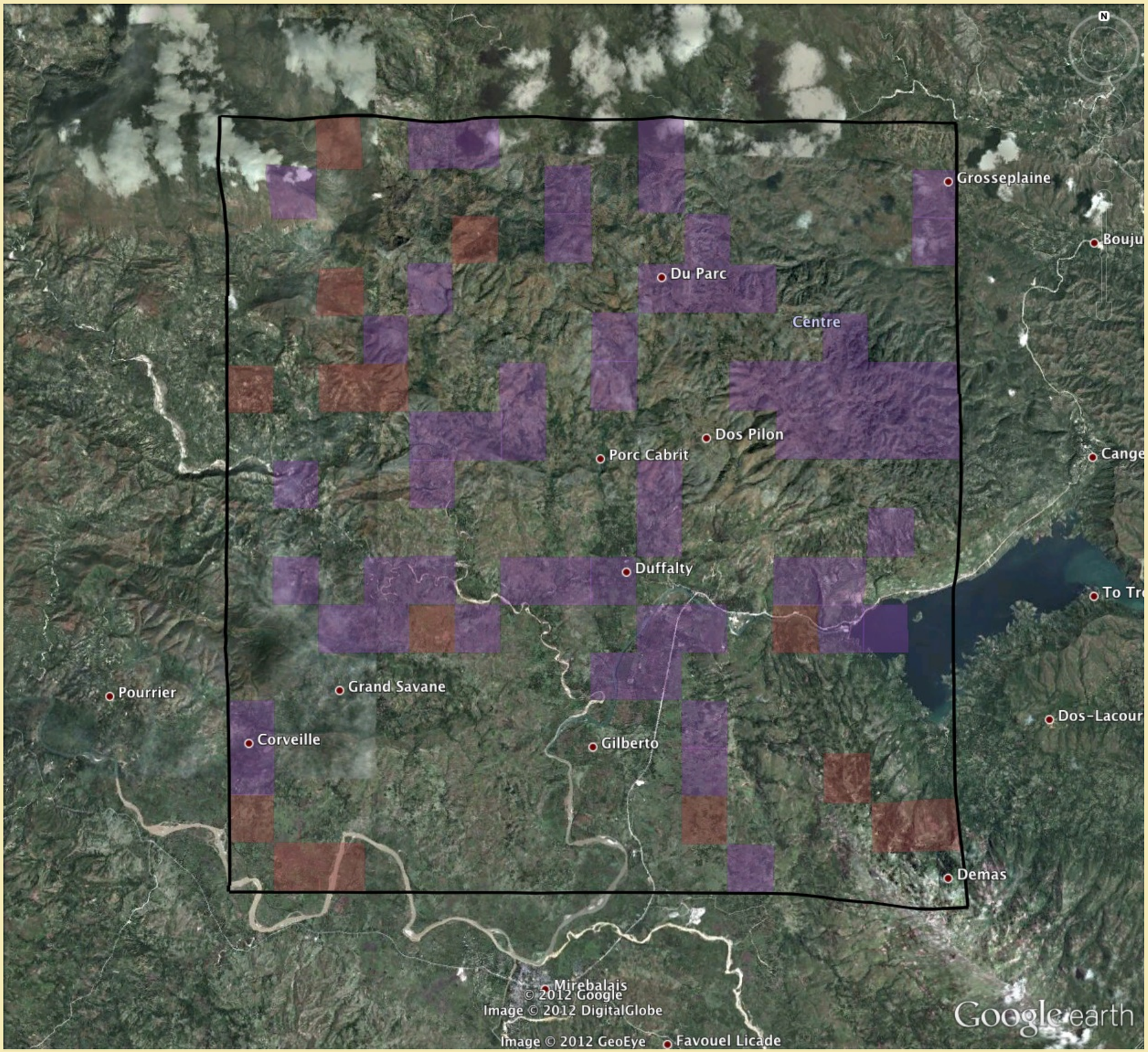
Type of Soil Conservation Practice

Research Objectives

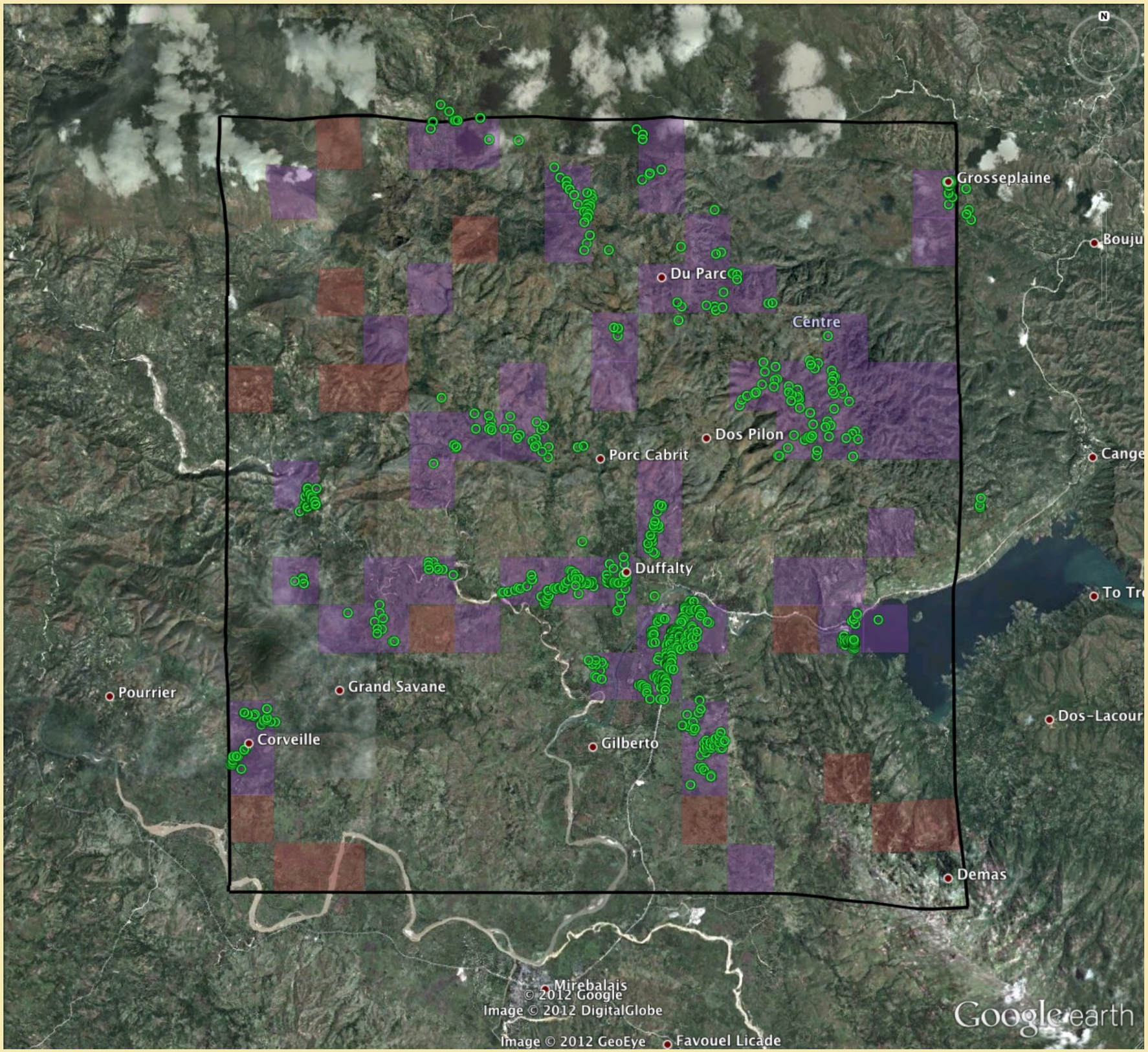
1. Determine the drivers in the adoption of live and dead soil conservation practices
2. Examine the intensity of use
3. Determine the value of adoption to households

Household Survey

Household Survey



Household Survey



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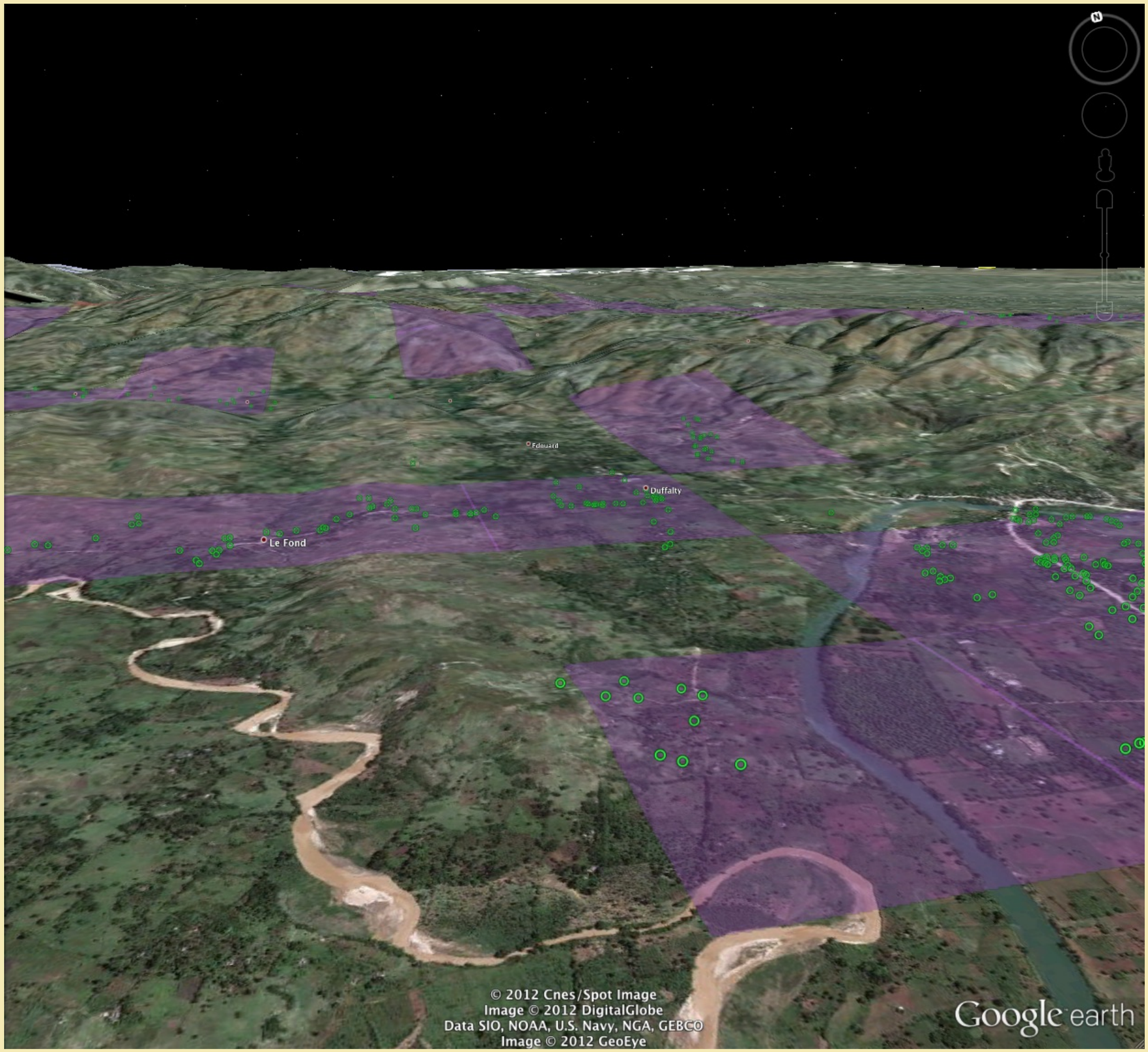

Analytical Methods

- Probit models examining plot-level adoption of live and dead soil conservation practices
- Tobit models examining the extent of live and dead soil conservation practices across the farm
- Random utility framework is the basis for the behavior models
- Cobb-Douglas production function with soil conservation practices as explanatory variables

	Description	Mean	SD
Plot-Level	Live SWC (Dummy)	.235054	.424321
	Dead SWC (Dummy)	.424321	.385036
	Plot Distance (Minutes)	28.08152	37.71005
	Irrigation (Dummy)	.080163	.271730
	Flat (Dummy)	.513587	.500155
	Poor Soil (Dummy)	.111413	.314857
	Area (Karo)	.505574	.394509
	Title (Dummy)	.184783	.388385
	Plot Crop Diversity (0-1 Index)	.444670	.444670
Household-Level	Plots	1.518248	.637474
	Total Land	.989410	.759335
	Distance to Market	2898.074	2349.769
	Males Per Karo	3.248941	4.014725
	Females Per Karo	3.229807	3.718631
	Children	1.488550	1.390748
	Hired Days of Ag. Casual Labor	20.79657	263.3470
	Days of Ag. Communal Labor	19.60333	51.50634
	HoH Age	47.62660	13.88039
	HoH Years of Education	2.923077	3.440158
	HHM Days Sick Per Month	.809054	1.715455
	Value of Crop Production	351.2340	475.7579
	Non-Ag. Income	417.1636	568.2457
	Value of Livestock (USD)	612.1098	708.1184
	Charcoal Income (USD)	69.37976	268.2073
	Credit 2011 (USD)	62.94924	215.5161

Probit - Adoption

Variable	Live Barriers			Dead Barriers		
	Marginal Effect	Standard Error	z	Marginal Effect	Standard Error	z
Plot Distance	.00046	.00038	1.21	-.00023	.00039	-.59
Flat	-.17340	.03383	-5.05	-.14542***	.03074	-4.73
Poor Soil	.09262	.05600	1.65	-.11788***	.03634	-3.24
Plot Area	-.03545	.04534	-.78	.02664	.04348	.61
Title	-.01854	.03887	-.48	.06857*	.03978	1.72
Plot Crop Diversity	.13327	.06064	2.20	.14814***	.05737	2.58
Total Land	.00811	.02222	.36	.14814***	.05737	2.58
Distance to Market	.16712D-04	.6299D-05	2.65	.76856D-05	.5964D-05	1.29
Males Per Karo	-.01400	.00930	-1.51	.01312**	.00613	2.14
Females Per Karo	-.02813**	.01141	-2.47	-.00866	.00668	-1.30
Children	-.00967	.01123	-.86	-.00348	.01073	-.32
HoH Age	.00064	.00127	.50	-.00268**	.00119	-2.26
HoH Years of Education	-.00742	.00496	-1.49	-.00301	.00453	-.67
HHM Days Sick Per Month	-.06670***	.02248	-2.97	.00692	.00891	.78
Non-Ag. Income	-.13245D-04	.3418D-04	-.39	-.60670D-06	.2882D-04	-.02
Value of Livestock (USD)	.13678D-04	.2301D-04	.59	-.14459D-05	.2158D-04	-.07
Charcoal Income (USD)	.00012	.7228D-04	1.62	-.00010	-.00010	-1.05
Credit 2011 (USD)	.00029***	.9610D-04	2.99	-.75319D-05	.00011	-.07

Tobit – Intensity

Variable	Live Barriers			Dead Barriers		
	Marginal Effect	Standard Error	z	Marginal Effect	Standard Error	z
Ave. Plot Distance	.00050	.00045	1.11	-.00027	.00057	-.48
Irrigation Ratio	.04847	.07414	.65	.00693	.08370	.08
Flat Ratio	-.12984***	.03771	-3.44	-.12794***	.04196	-3.05
Poor Soil Ratio	.05466	.04929	1.11	-.25753***	.08486	-3.03
Total Land	-.02206	.02121	-1.04	.01071	.02401	.45
Distance to Market	.11003D-04*	.6155D-05	1.79	.12773D-04*	.7078D-05	1.80
Males Per Karo	-.00788	.00736	-1.07	.00725	.00595	1.22
Females Per Karo	-.02625***	.00841	-3.12	-.00571	.00615	-.93
Children	-.01793*	.01064	-1.69	.00085	.01186	.07
HoH Age	.00114	.00113	1.01	-.00160	.00128	-1.24
HoH Years of Education	-.00480	.00473	-1.01	-.00034	.00524	-.06
HHM Days Sick Per Month	-.05990***	.02024	-2.96	.00775	.00927	.84
Title Ratio	-.00841	.03854	-.22	.02456	.04219	.58
Non-Ag. Income	-.35406D-04	.3263D-04	-1.09	-.10762D-04	.3226D-04	-.33
Value of Livestock (USD)	.61969D-05	.2193D-04	.28	-.27006D-04	.2585D-04	-1.04
Charcoal Income (USD)	.87137D-04	.6179D-04	1.41	-.00028*	.00015	-1.81
Credit 2011 (USD)	.00011	.9282D-04	1.15	-.00018	.00015	-1.21
Crop Diversity	.08147	.07545	1.08	.07582	.08391	.90

Cobb-Douglas Production Function

Variable	Coefficient	Standard Error	t
Ave. Plot Distance	.09791**	.04870	2.01
Irrigation Ratio	.12784***	.04524	2.83
Flat Ratio	.02927	.02852	1.03
Poor Soil Ratio	-.02725	.03924	-.69
Owned Land	.36252***	.07895	4.59
Distance to Market	.00085	.04841	.02
Male Ag Labor Days	.01142	.01816	.63
Female Ag Labor Days	-.01933	.01414	-1.37
Children	-.00475	.02191	-.22
HoH Age	-.23928	.18817	-1.27
HoH Years of Education	.03768**	.01847	2.04
Title Ratio	.01329	.02916	.46
Days Hired Labor	.05482***	.01565	3.50
Days Communal Labor	.01801	.01384	1.30
Live Cons. Practice Ratio	.10591***	.02883	3.67
Dead Cons. Practice Ratio	.00175	.02843	.06
Crop Diversity	.32135***	.07013	4.58

Conclusions

- Plot specific characteristics play an important role in adoption
- Apparent differentiation between in the models for live and dead barriers;
- Perception of soil fertility is a significant factor in decisions for different types of conservation practices
- Results suggest that risk preferences may play a role in adoption and intensity of use.
- The production gains associated with live barriers are estimated to be $3.72 for every 10% increase in coverage.

Future Research

- An integrated study of charcoal and tree-planting decisions.
- An examination of planting decisions with the onset of the rainy season and the associated losses and gains in productivity.