Evaluating & Learning in Haiti: Household Impacts of SRI

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Motivating Research Questions

- **What impact does a coordinated SRI intervention have on rural households?**
  - Welfare impacts to study include farm profit, income, and food security measures.
- **What mechanisms drive the household impacts of SRI?**
  - What characteristics drive SRI adoption decisions, including partial adoption?
  - Benefits may vary based on household and plot characteristics such as risk aversion, the agronomic potential of SRI on different plots, and the availability and opportunity cost of household labor.
  - What is the impact of the availability of agricultural credit on SRI adoption and household welfare?
- **What is the role of coordination with neighbors in SRI adoption and implementation?**
  - Does cooperation among farmers affect adoption decisions and/or the success of SRI?
  - Does the importance of coordination vary depending on physical location and plot characteristics?
  - How do adoption rates and the benefits of SRI change as farmers learn from neighbors?
  - How might sustainable coordination and cooperation among farmers be encouraged?
- **SRI is a charged and polarizing topic and a risky research pursuit**
  - "What team are you on?" Team Agnostic!
  - Several are watching this evaluation carefully! (World Bank, USAID, Gates, IRRI, CIMMYT, IFPRI, Cornell, etc.)

Research Challenge & Design

Challenges

1. Selection bias

   If only the best farmers seek out SRI information and adopt SRI, then comparisons with non-SRI farmers will be biased

2. Measurement bias

   If we mis-measure and under-value weeding labor, then we will exaggerate rice profit

3. Definition bias

   If the practices that compose SRI are only loosely defined, then it is difficult to evaluate

Design

1. Randomized exposure to SRI
   - SRI blocs selected randomly with matched control blocs
   - Random, farmer-level incentives to adopt SRI
2. Careful, intra-seasonal measurement of inputs
   - Value of family and hired labor
3. Consistent definition of SRI
   - SRI-linked credit creates opportunity for common definition
   - Nursery, transplanting (age, number, grid), fertilizer, alternate wetting-drying

Baseline Farmer Characteristics

Land Use and Ownership

	Castera	Eroi	Hauzin	Potri	Total
Parcels Cultivated	2.414 (1.359)	2.227 (1.549)	2.718 (1.902)	2.033 (1.141)	2.360 (1.538)
Land Area Cultivated (pa)	66.73 (62.00)	56.69 (69.35)	52.23 (85.82)	52.23 (60.23)	57.70 (70.32)
Land Area Owned (pa)	30.81 (59.16)	28.53 (44.24)	29.53 (78.27)	26.11 (59.00)	28.87 (61.45)

Standard deviation in parentheses

PERIMETRE IRRIGUE DE LA VALLEE DE L'ARTIBONITE

Bloc d'irrigation de Haut-Zin

Legende

RESEAU D'IRRIGATION DE HAUT-ZIN

- Principal
- Tete morte
- Secondaire
- Tertiaire
- Quaternaire
- Drain
- Riviere
- LIMITE DU BLOC
- LIMITE DES PARCELLES

0 80 160 240 Kilometers

FACULTE D'AGRONOMIE ET DE MEDECINE VETERINAIRE (FAMV)

Source de donnees:
Limites administratives : CNIGS
Limite des parcelles : delinie a partir des donnees de terrain et de focus group

Date: Fevrier 2014

CARTE PARCELLAIRE DE HAUT-ZIN

(Superficie totale : 41.86 ha)

Baseline: Food Security

- 62.5% reported feeling food insecure at least part of the year
- 35.6% reported feeling food insecure the entire year
- The most food-insecure season is between the end of the dry season and the start of the rainy season
- During food-insecure times of year, most households report being worried about not having enough food, being forced to limit meals, and being unable to eat their preferred foods
- 41% of households report having to go an entire day without eating due to lack of food, and 10% report having to do so frequently (more than 10 times during the worst month of the year)

Steps of rice cultivation in the Artibonite valley

1. Nursery plants

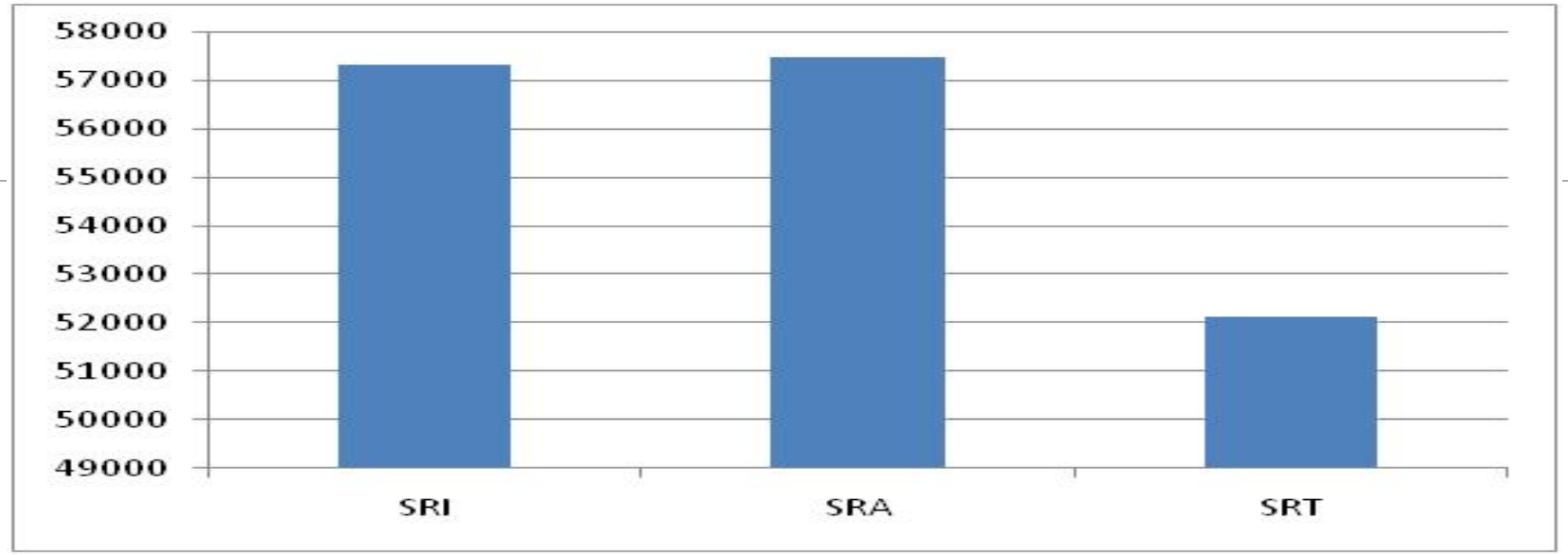
2. Preparation of the soil

3. Seedlings transplantation

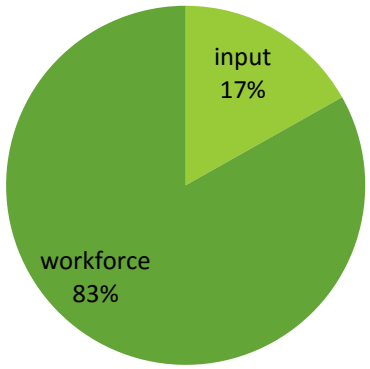
4. Crops maintenance

5. Harvest and post-harvest

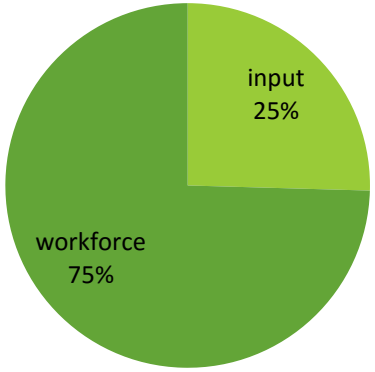
Production cost per ha on 2015



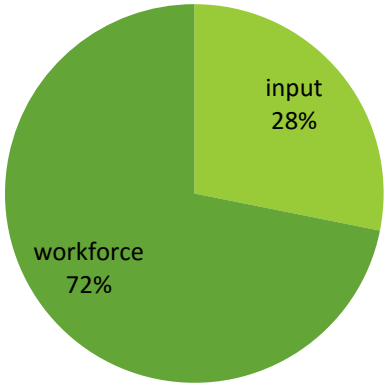
SRI



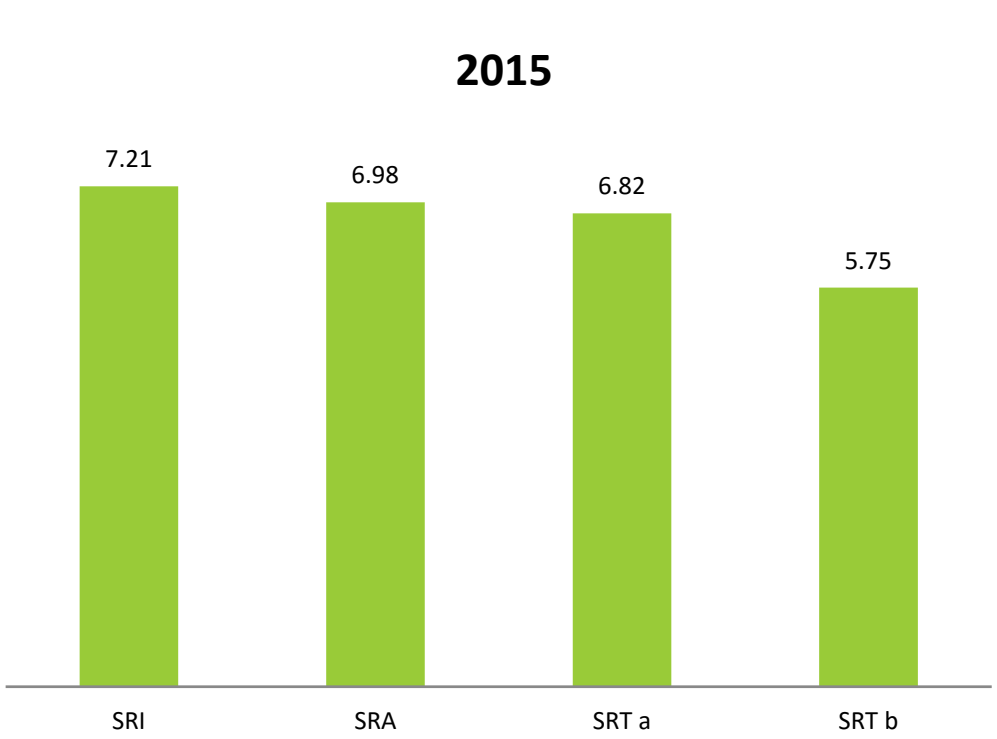
SRA

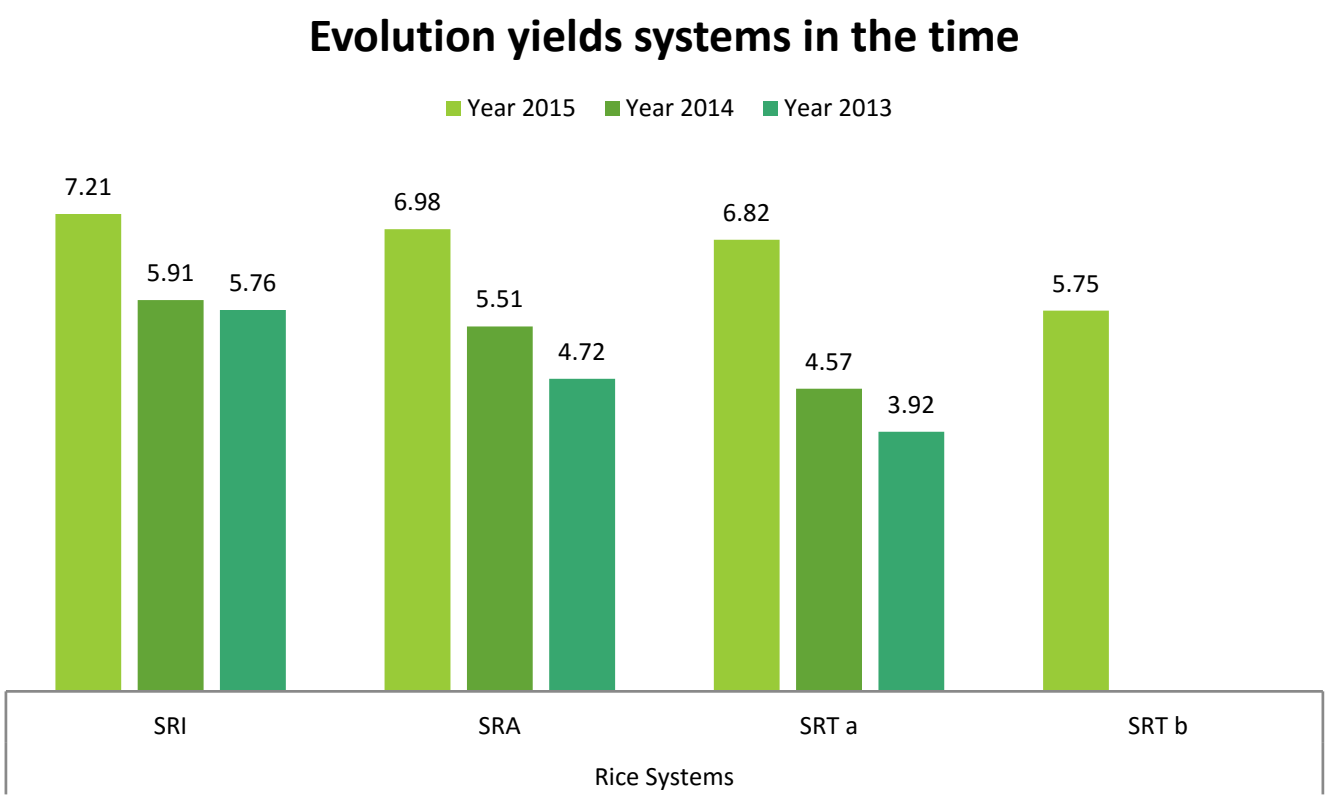


SRT



Yield (T/ha)


2015
7.21
6.98
6.82
5.75
SRI
SRA
SRT a
SRT b


Evolution yields systems in the time
Year 2015
Year 2014
Year 2013
7.21
5.91
5.76
6.98
5.51
4.72
6.82
4.57
3.92
5.75
SRI
SRA
SRT a
SRT b
Rice Systems

2014 & 2015 SRI Adoption Rates

2014	Percent of Farmers Adopting SRI	Percent of Land Area in each planting system (by bloc)		
		Traditional	Ameliore	SRI
Castera	3.9%	89.1%	10.2%	0.7%
Eroi	2.0%	83.6%	16.1%	0.3%
Hauzin	**35.3%**	**52.7%**	**29.8%**	**17.5%**
Potri	**51.2%**	**91.7%**	**0.2%**	**8.1%**

2015	Percent of Farmers Adopting SRI	Percent of Land Area in each planting system (by bloc)		
		Traditional	Ameliore	SRI
Castera	1.8%	96.4%	3.0%	0.6%
Eroi	0.0%	83.9%	16.1%	0.0%
Hauzin	**15.3%**	**71.2%**	**15.8%**	**13.0%**
Potri	**21.3%**	**93.5%**	**1.7%**	**4.8%**

Who is adopting SRI in 2015? Emerging Patterns

- Variables that are positively correlated with SRI adoption include education of the household head, farm profit (measured in 2013), and the number of parcels in the study area
- Involvement in wage labor is negatively correlated with adoption
- Variables that appear to be positively, but weakly, correlated, are female-headed households and nonfarm income
- Interestingly, none of these variables other than education level are strongly correlated with *intending* to adopt SRI
- Total *family* labor used during the rainy season at baseline is negatively correlated with adopting SRI – this finding is surprising given the labor requirements of SRI
- Total hired labor, total land cultivated, household size, amount of time spent in off-farm activities during the busy weeks of the planting season do not correlate with SRI adoption

Adoption 'Transition Matrix' 2014-15

Adopted SRI 2014	Adopted SRI 2015=No	Adopted SRI 2015=Yes	Total
No	90%	10%	100%
Yes	58%	42%	100%
Total	81%	19%	100%

Adopted SRI 2014	Intended to Adopt SRI 2015=No	Intended to Adopt SRI 2015=Yes	Total
No	81%	19%	100%
Yes	48%	52%	100%
Total	71%	29%	100%

Much More to Do –
Much More to Discuss