French National Research Institute for Sustainable Development

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Collective Action and Rice Farming: An Analysis of Irrigation Management in the Cambodian Floodplains

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09th December 2021

Content of the presentation

- Background of agriculture
- Modalities of (Participatory) Irrigation Management
- Case study area and methodology
- Long term trends in water infrastructure and agriculture development
- Institutional Bricolage: Roles and responsibilities of actors
- Results
- Key messages

Background of Agriculture

- Cambodia: agriculture accounts for 22.8% of national economy (GDP)

- Rice (*Oryza sativa* L.) = food security and income generation for the rural population in Cambodia
  Rice is main crop while crop contributes by 60% to agricultural GDP 2020

Modalities of Irrigation Management

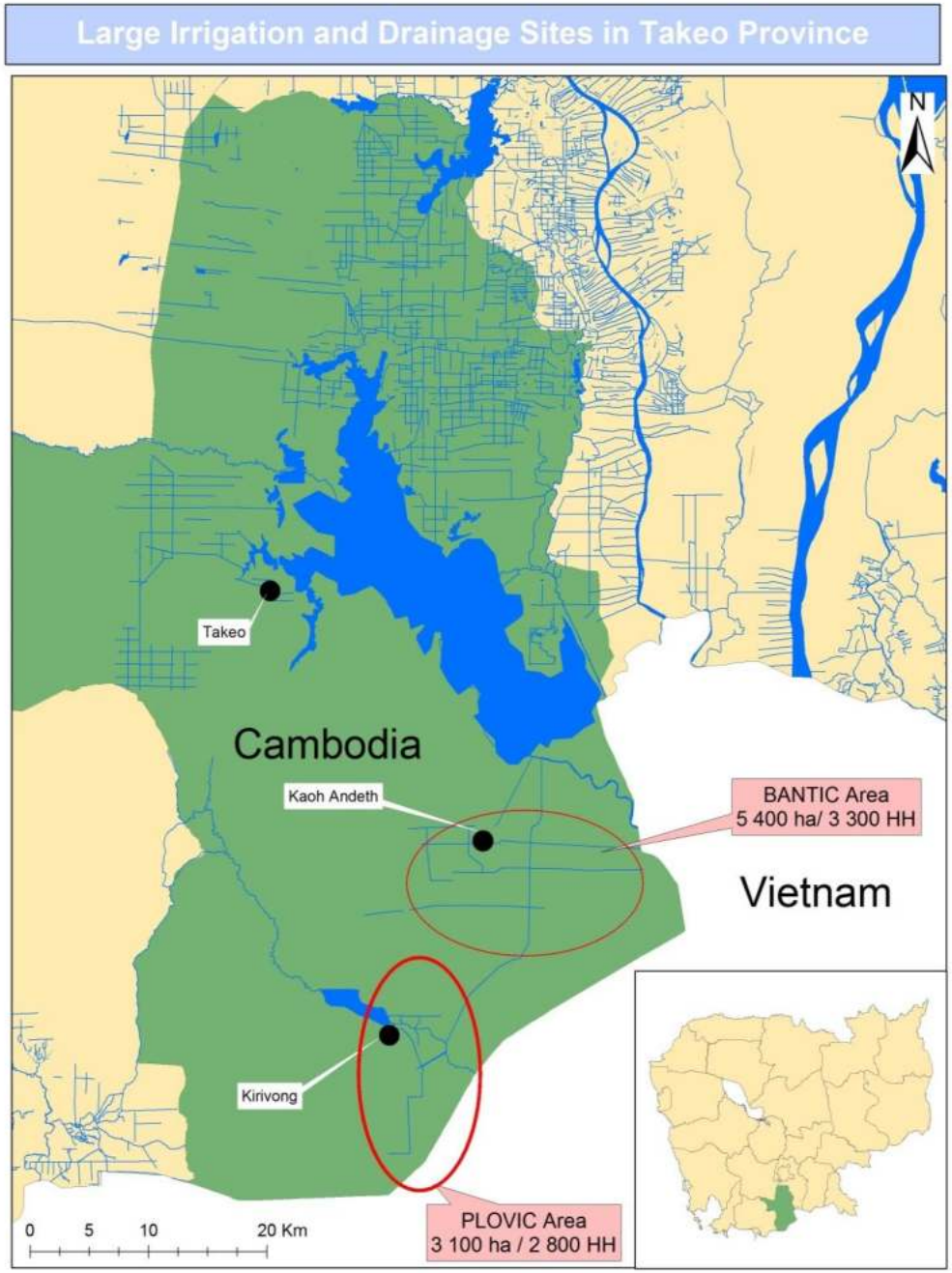
- Participatory Irrigation Management (PIM) and Development Policy enacted in **1999/2000**
- Establishment of Water User Associations (called FWUC: Farmer Water User Community)
- FWUC responsible for **maintenance** of 2nd and 3rd tier canal systems through the collection of an **Irrigation Service Contribution** (ISC)
- **Classic shortcomings of PIM policies (Challenges):**

  1/ Reluctance of administration to devolve power/authority

  2/ Lack of capacity, legitimacy, accountability of FWUC

  3/ Unwillingness of farmers to pay ISC

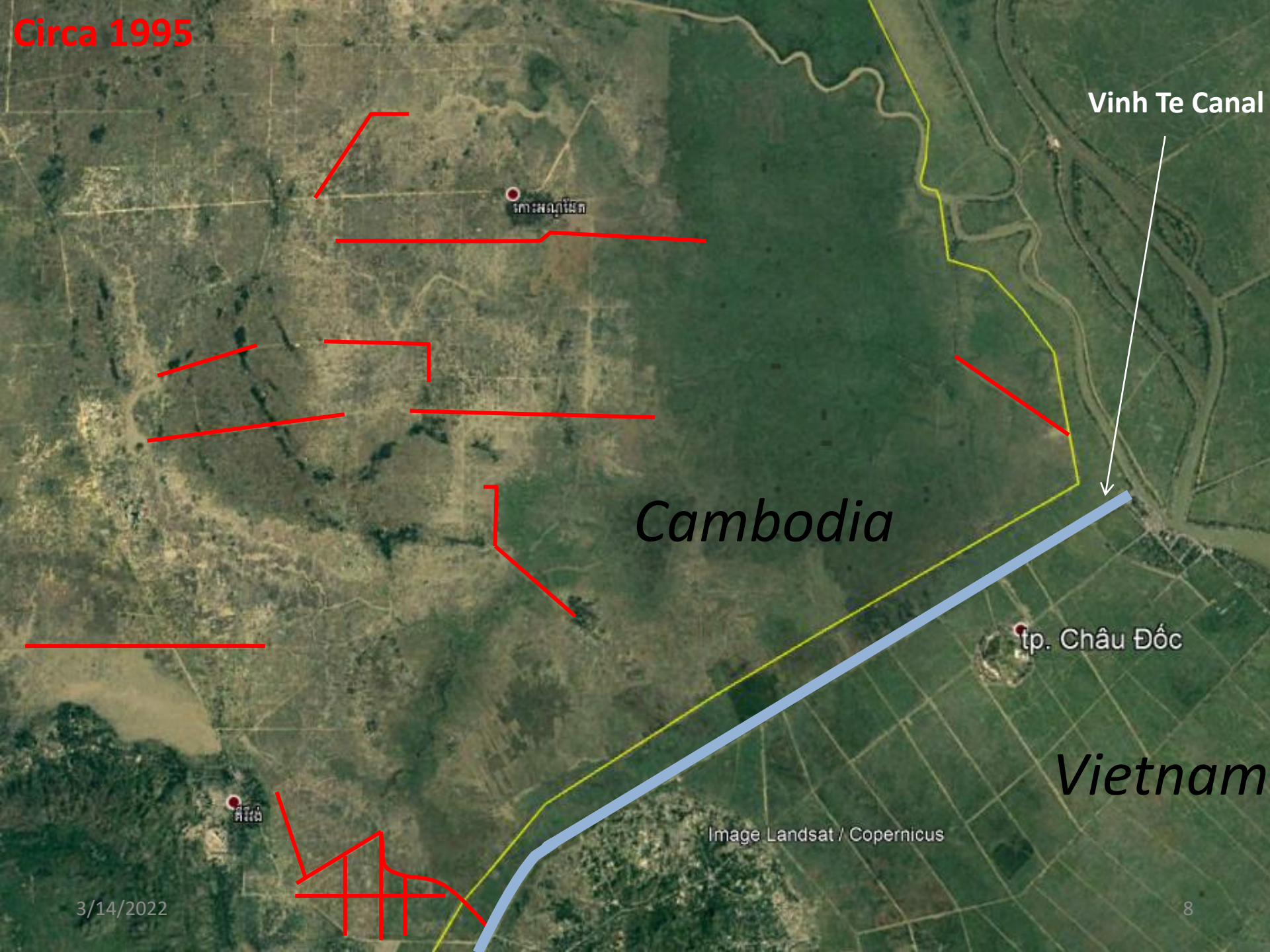
  4/ Deferred maintenance problems/long term lack of sustainability



Case Study Area

- South of Cambodia at the border of Vietnam
- Large flood plains inundated between August and November
- Limited infrastructure development (when compared to Vietnam)
- **PRASAC project** (financed by the EU) between 1998 and 2004 and **CAVAC project** (DFAT-Australia) between 2012 and 2017
- Large earthen drainage network supporting single or double rice cultivation

Historical development of the area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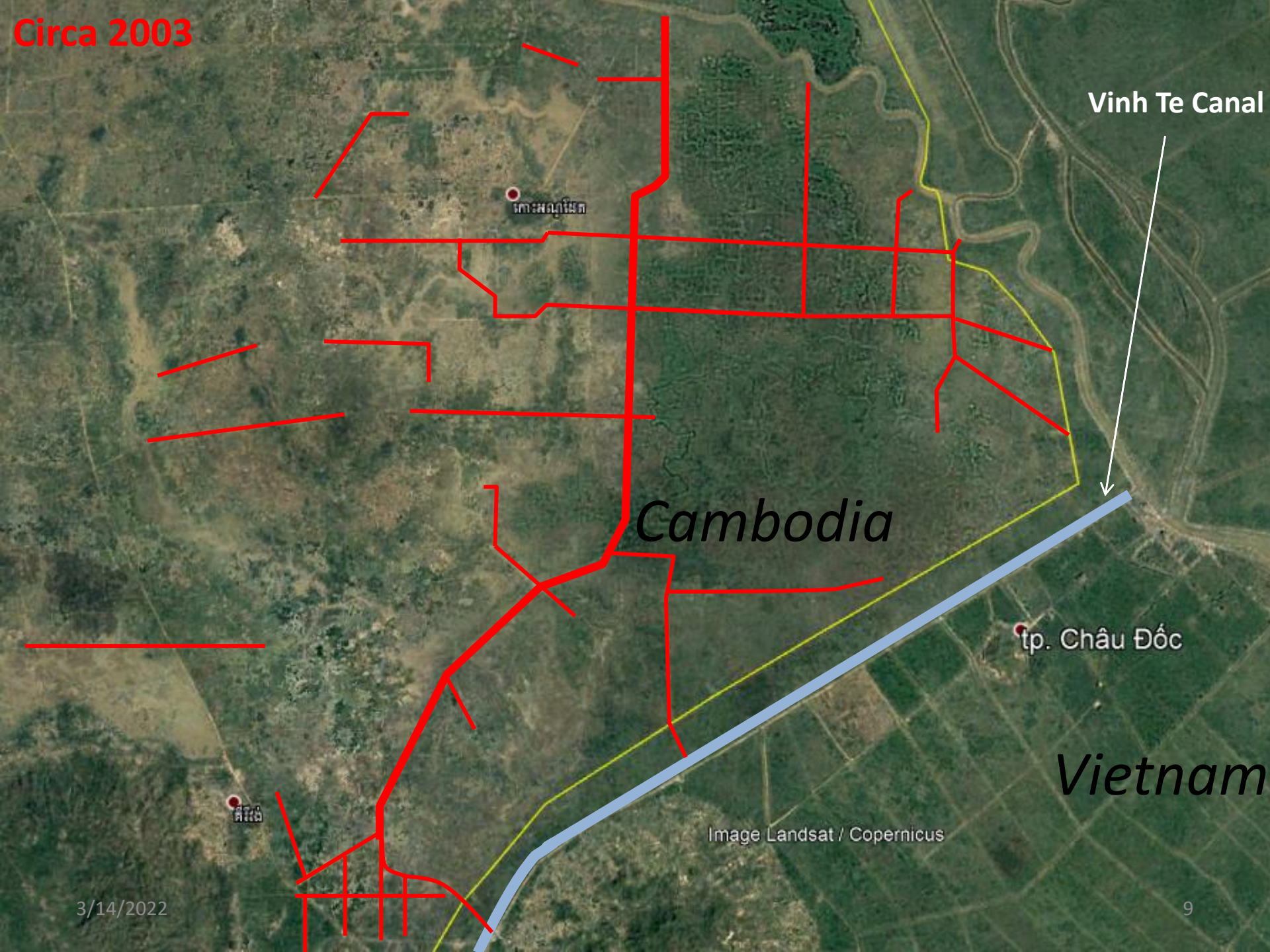
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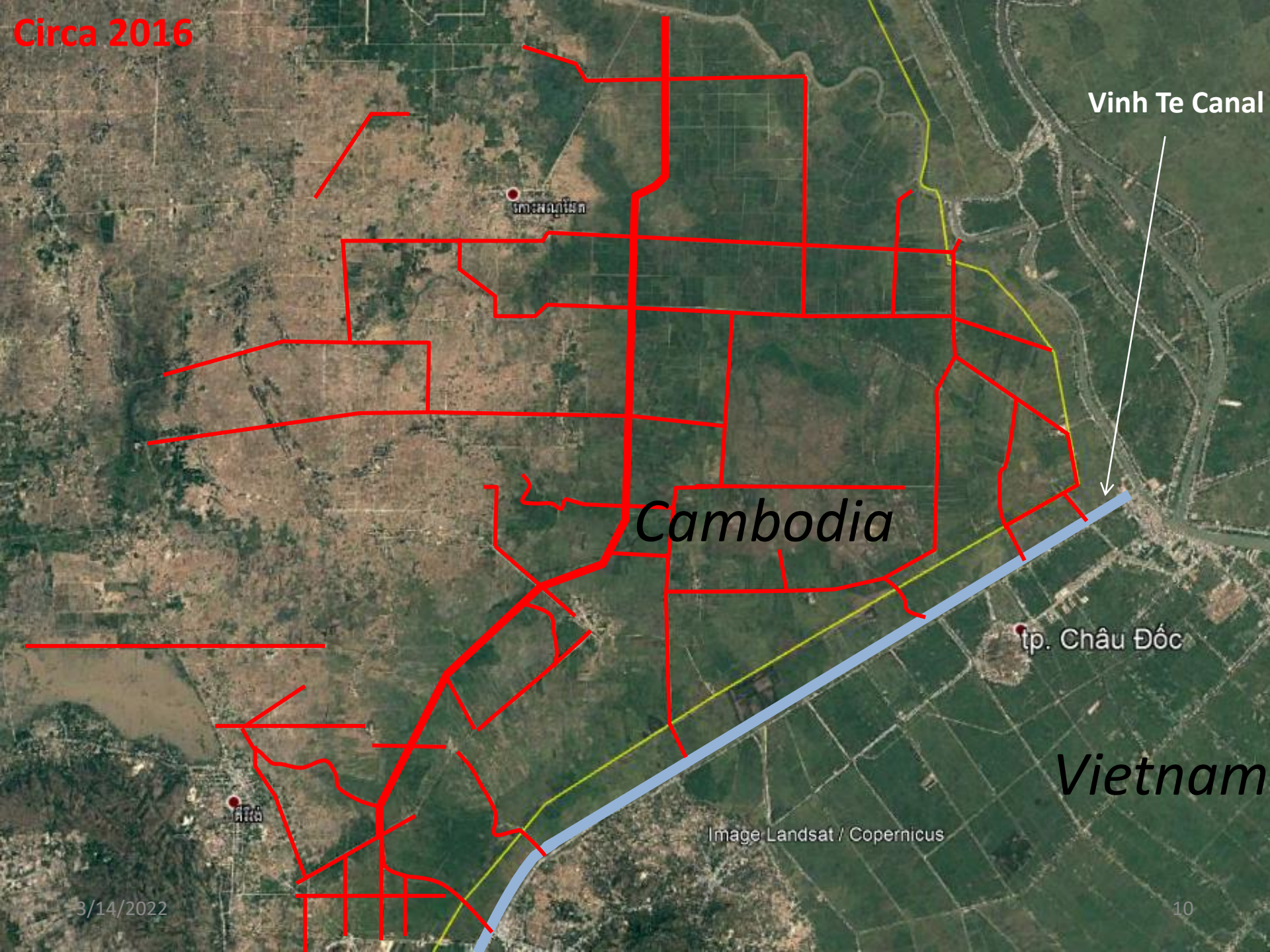
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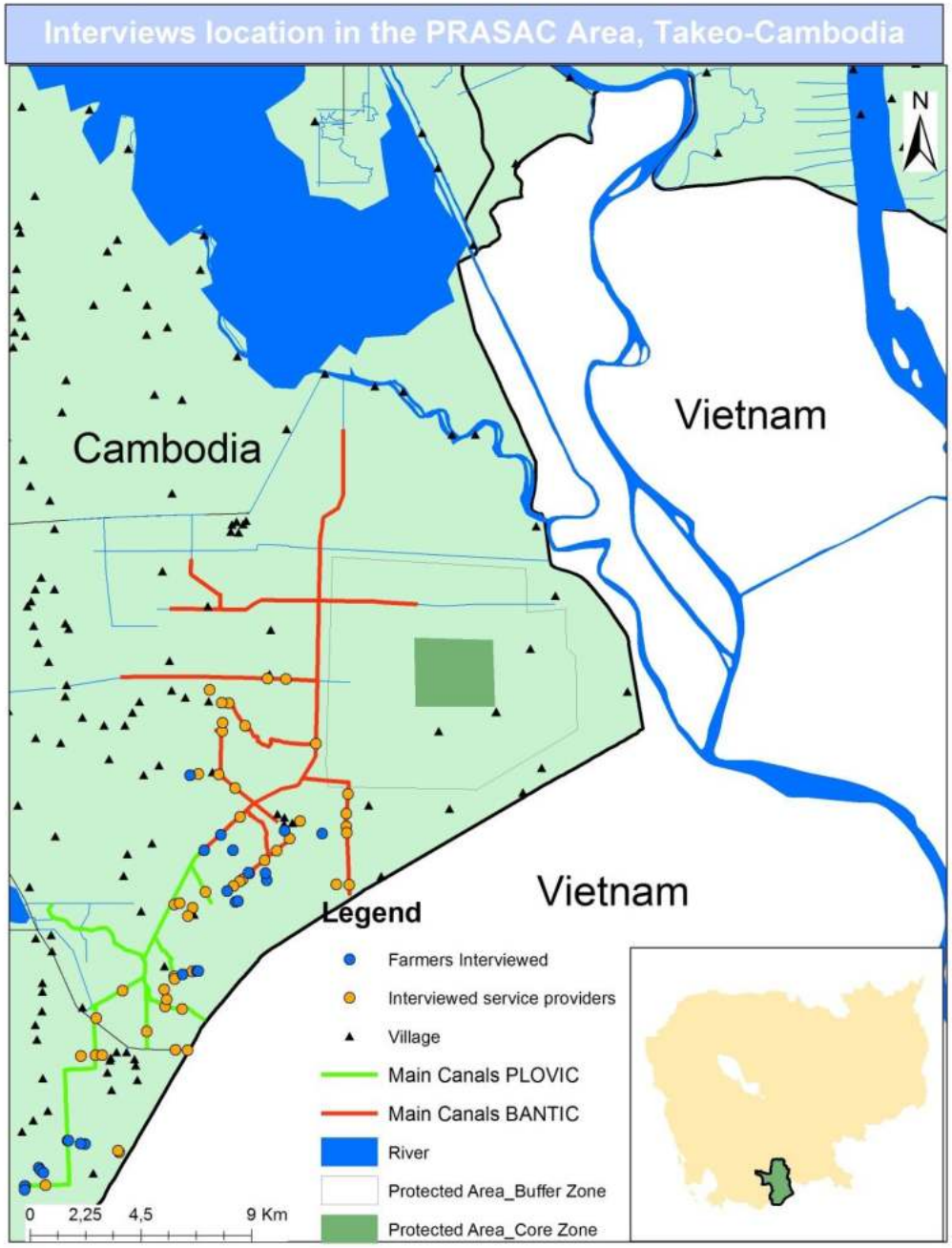


Methodology

Mixed methods: qualitative interviews, Focus Group Discussion, small N quantitative questionnaire

- **Key informant interviews**
- **Staff of administration** (Ministry of Water Resources and Meteorology -MoWRAM)
- **Representatives** of Water User Associations (FWUC)
- **Local Elected Representatives**
- **Private Water Sellers** (15 in BANTIC and 16 in PLOVIC) representing 55 pumping systems
- **25 farmers** (12 in BANTIC and 13 in PLOVIC) along secondary canals

Main PRASAC Canal (canal 98/99)

'Secondary' PRASAC Canal (Ex: Saom, Plouv Touk, etc...)

To Vietnam

Canal managed by PWS (can be called secondary or tertiary)

Hybrid local water governance

FWUC

Hand-over Irrigation Service Contribution (140kg/ha/year

If direct pumping Pay Irrigation Service Contribution (140kg/ha/year)

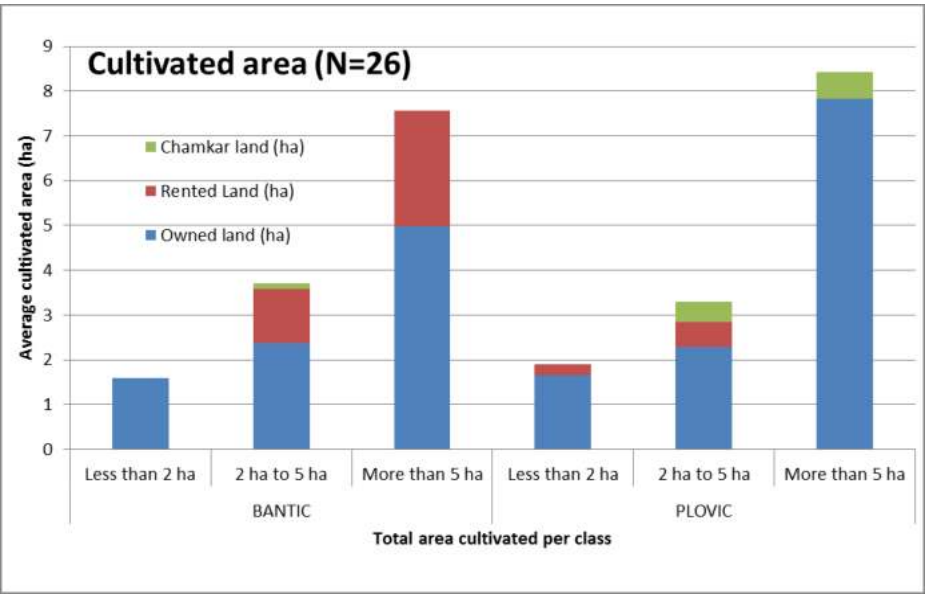
FARMERS

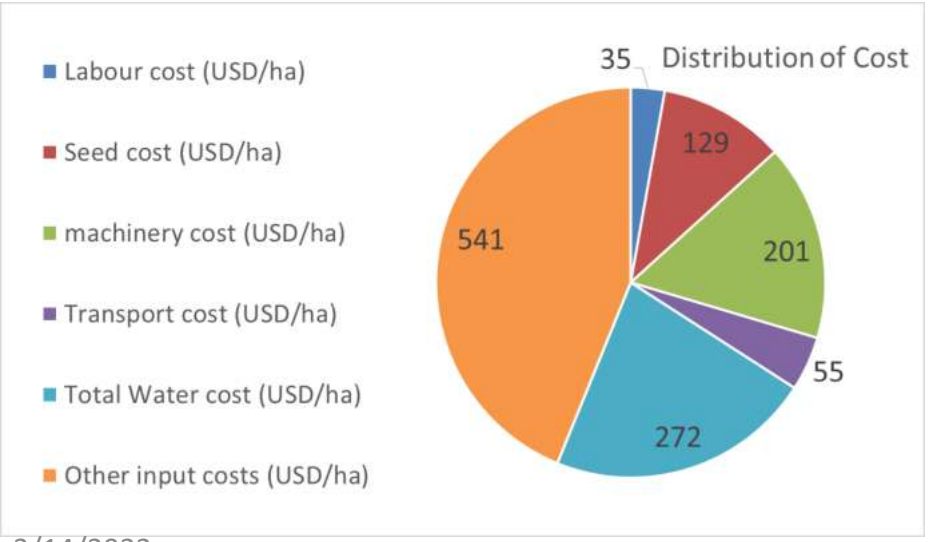
PWS

Provide water to farmers by the mean of diesel/petrol pumps

Pay pumping "service" 600-750kg/ha/season

Results: Characteristics of Farmers





- Half the farmers < 40 years old
- 95% of farmers have MFI Loans
- All farmers purchase input through short term credits (10% interest rate per season)

- Average owned area is **3,5 ha**
  - Minimum= 1 ha
  - Maximum= 12 ha

Water cost is

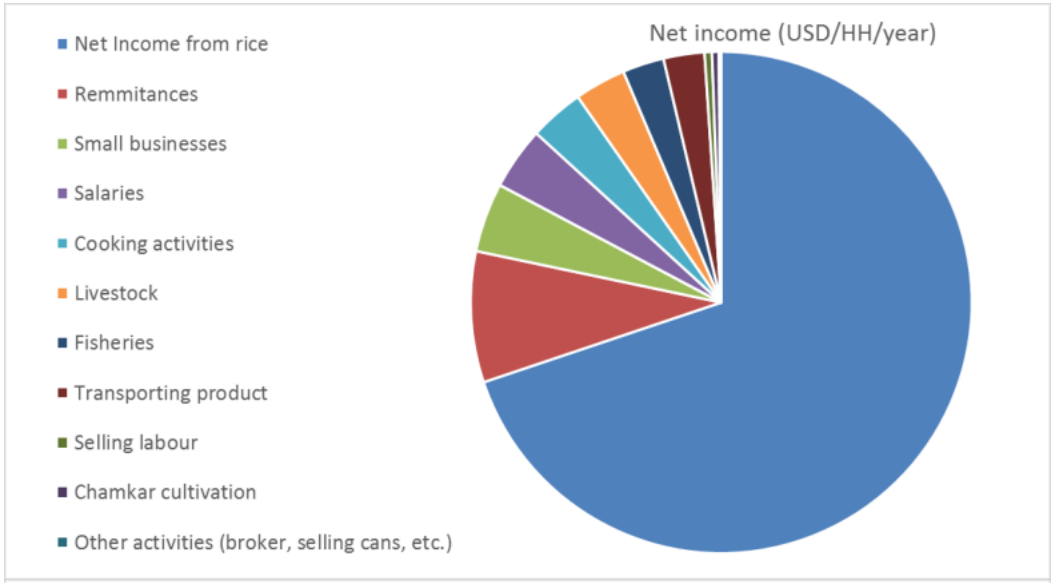
- **20 to 25% of total cost**

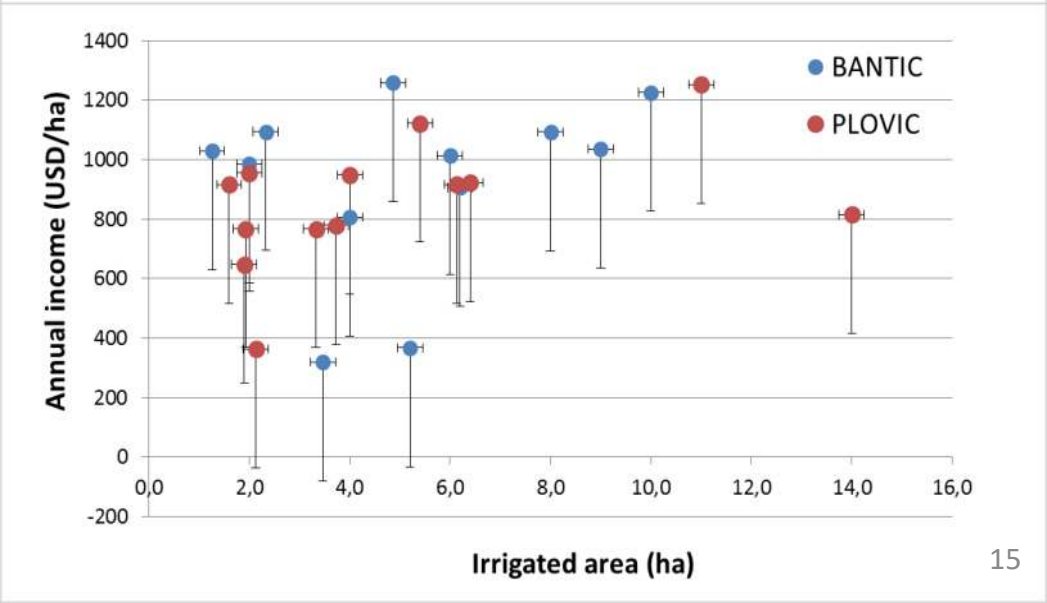
Results: Characteristics of Farmers

- ❖ High diversity of income source
- ❖ Rice cultivation is 60% of total income

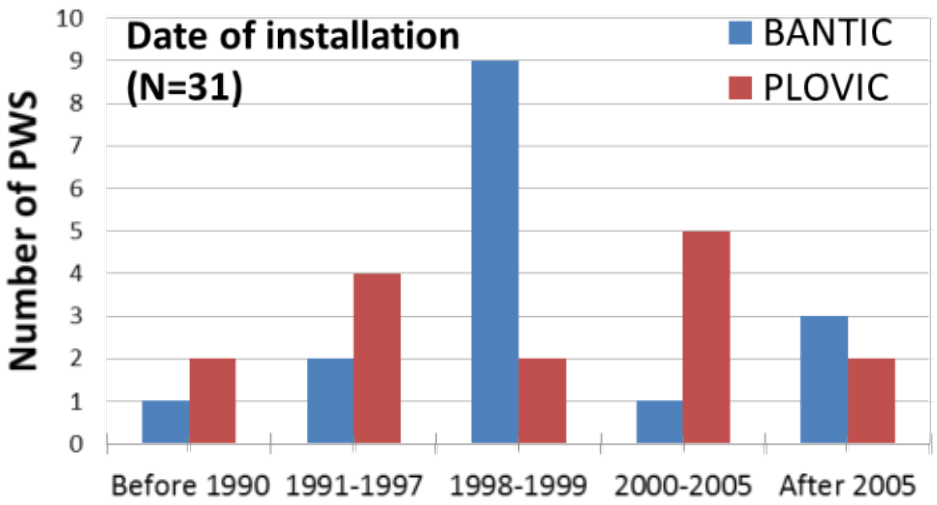
- ❖ Net revenues very *sensitive to paddy price* in Vietnam (export of paddy)
- ❖ Early wet season rice (***May-July***) *sensitive to water supply conditions*

- Relative stability of income relative to farm area (little economy of scale)
- Average net income of 600 USD/ha/year (average price)
- ❖ Average net income of 3 USD/day/person (for 7 months work) (daily wage in ag. work >5 USD/ha/day)





Results: Characteristics of PWS



- ❖ Some PWS started operating before the PRASAC project (1998)
- ❖ PWS accessed water from natural lakes, reservoirs and Vietnam
- ❖ Often well connected to local authorities and administration

- Average area served in BANTIC is 51 ha (between 3 and 250 ha)
- Average area served in PLOVIC is 65 ha (between 3 and 250 ha)
- 9 out of 31 PWS have increased the area they served since their installation
- 16 out of 31 have decreased the area they served since their installation

❖ On average, PWS **own 35%** of the area they serve

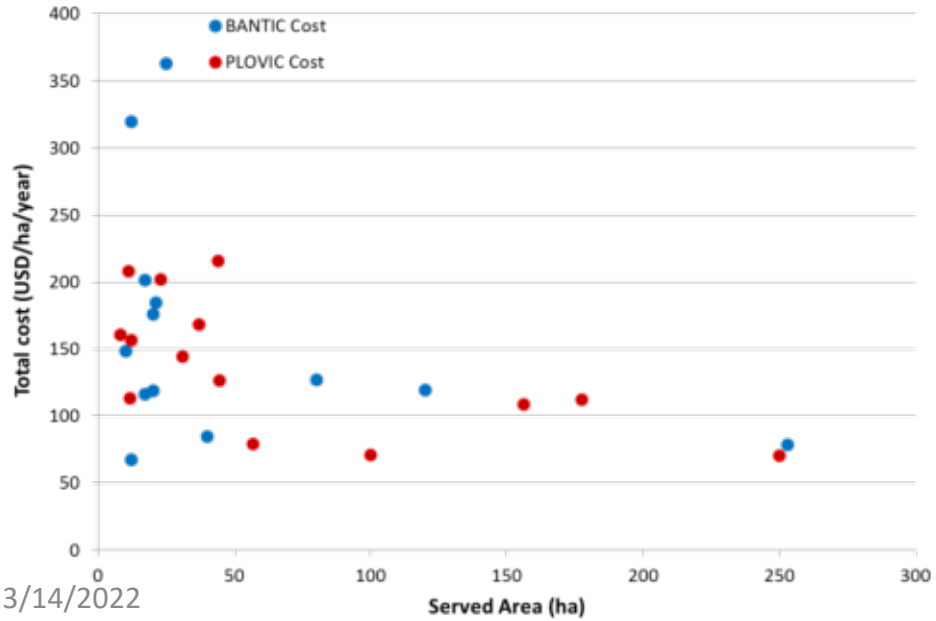
❖ More than half the PWS have purchased land since they started their business

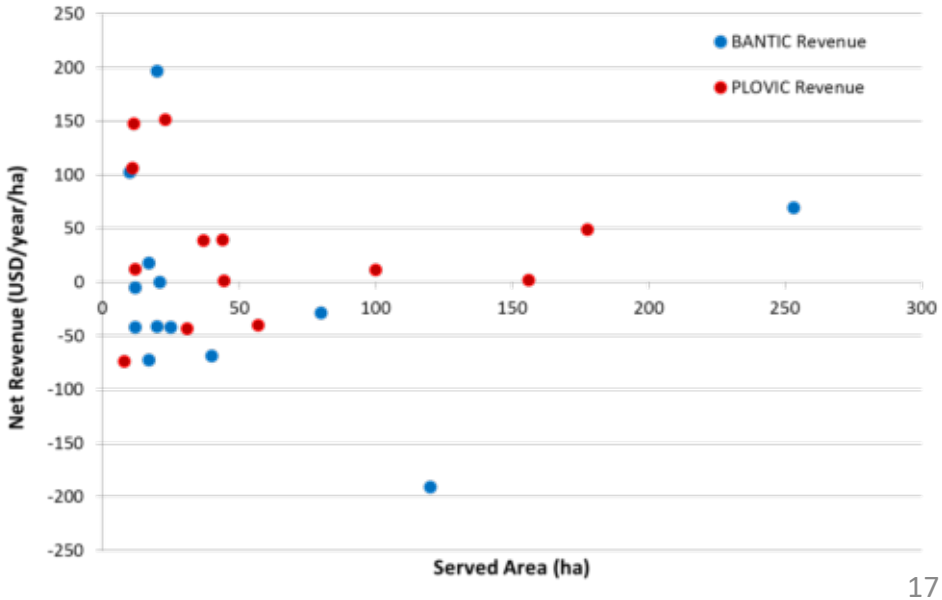
Results: Characteristics of PWS

- Pumping fee BANTIC: 125 USD/ha/season
- Pumping fee PLOVIC: 165 USD/ha/season

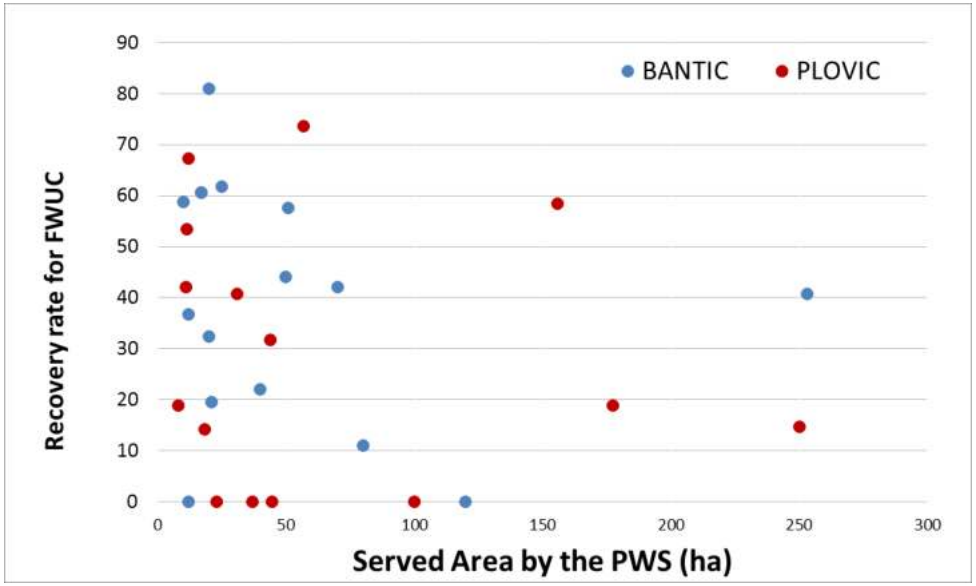
- Average operating cost of 155 USD/ha/year
- 55% of all cost are petrol cost
- Cost distribution high if served area <50 ha
- Economy of scale if area served > 50 ha

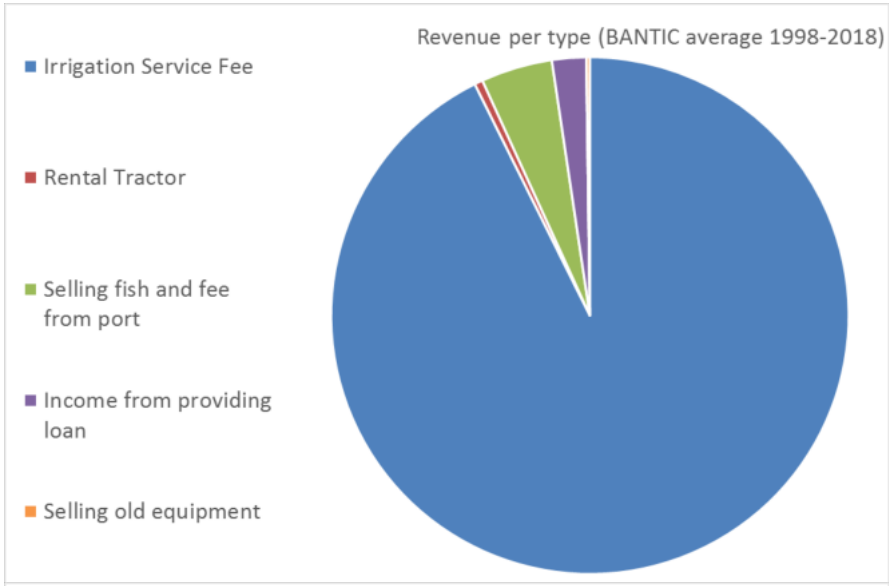
- Based on cost and revenue declaration, half the PWS appear to be loosing money
  - Recovery rate around 70 %
  - 10-15% discount is common practice
- Average loss: 82 USD/ha/year
- Average gain: 66 USD/ha/year

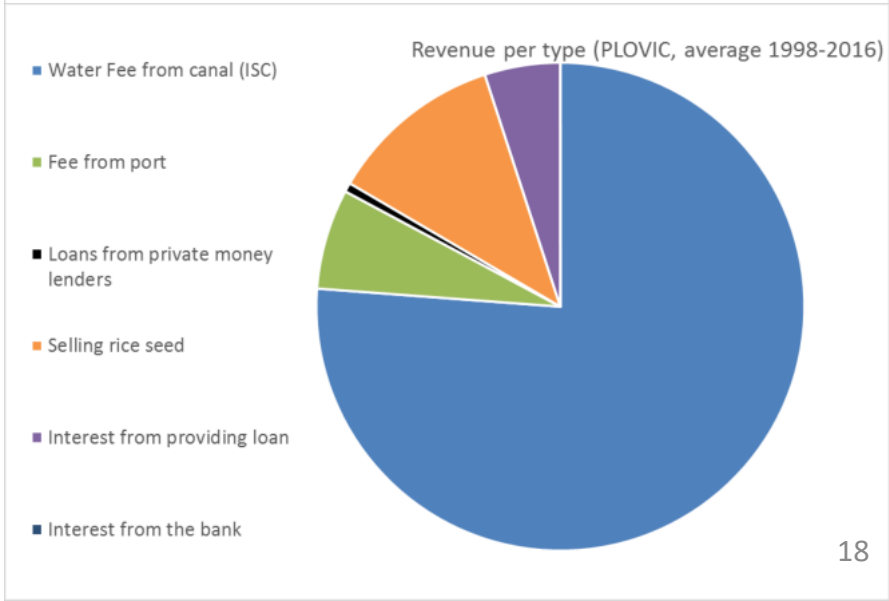




Results: Characteristics of FWUC







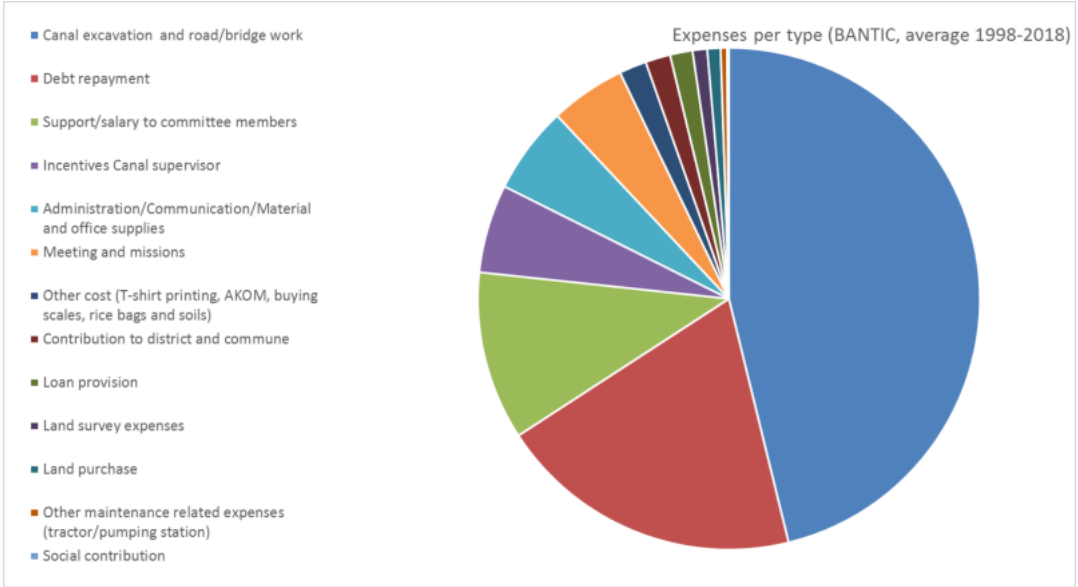
- ISC Rate of 17 USD/ha/year in BANTIC
- Recovery rate of 40% in BANTIC
- ISC Rate of 30 USD/ha/year in PLOVIC
- Recovery rate of 30% in PLOVIC
- Self-irrigation of PWS land often not accounted for though 1/3 of the area
- Farmers who provided land for canal construction partially exempted

Results: Characteristics of FWUC

BANTIC Investment in maintenance

- 45% of all expenses
- 0,7 USD/ha/year
- 15 USD/ha over 20 years

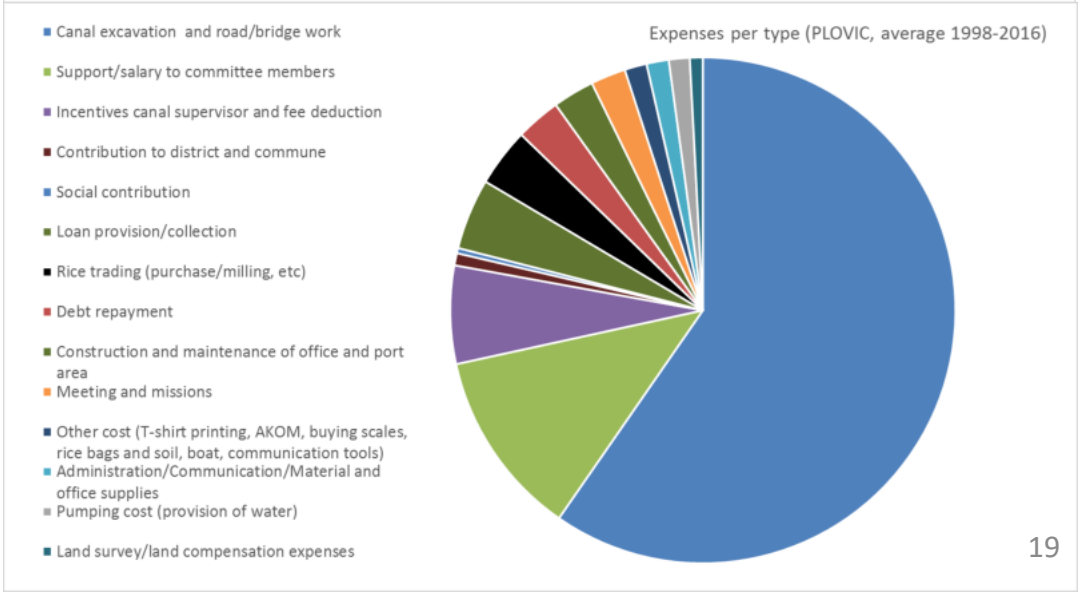
- Needs: 5 USD/ha/year
- ISC Collected: 7 USD/ha/year
- ISC rate: 17 USD/ha/year



PLOVIC Investment in maintenance

- 65% of all expenses
- 3,4 USD/ha/year
- 64 USD/ha over 18 years

- Needs: 6 USD/ha/year
- ISC Collected: 10 USD/ha/year
- ISC rate: 30 USD/ha/year



Key messages

- Irrigation and drainage management in the PRASAC area takes a hybrid form involving farmers, public organization and small rural entrepreneurs selling water to farmers
- **Dynamic Agricultural Landscapes**
  - Relatively young farmers
  - Widespread indebtedness and vulnerability to water availability/price fluctuation
  - Underlying land concentration process (to the benefit of PWS notably)
- **Water pumping service**
  - In general well off farmers-cum entrepreneurs
  - Profitability of the service is rather low (eq. to 400 kg of rice/ha)
  - Significant scope for reducing operational costs (e.g. petrol)
  - The main advantage of being a PWS might be that is leads to lower rice production cost (20-25%) and related increase in income
- **Drainage system management**
  - Current rate of ISC recovery could allow for meeting O&M needs
  - Investment in maintenance lower than needs
  - Need to account for land tenure dynamics

Thank you for your attention!