THE POLICY OF FREE ELECTRICITY FOR AGRICULTURE IN ANDHRA PRADESH AND ITS IMPACT ON FARMERS' WELL-BEING AND EMPLOYMENT SINCE 2004.

Research during the period from MAR 4 2013 ~APR 11 2013.

Master's thesis University of Oslo 2014.

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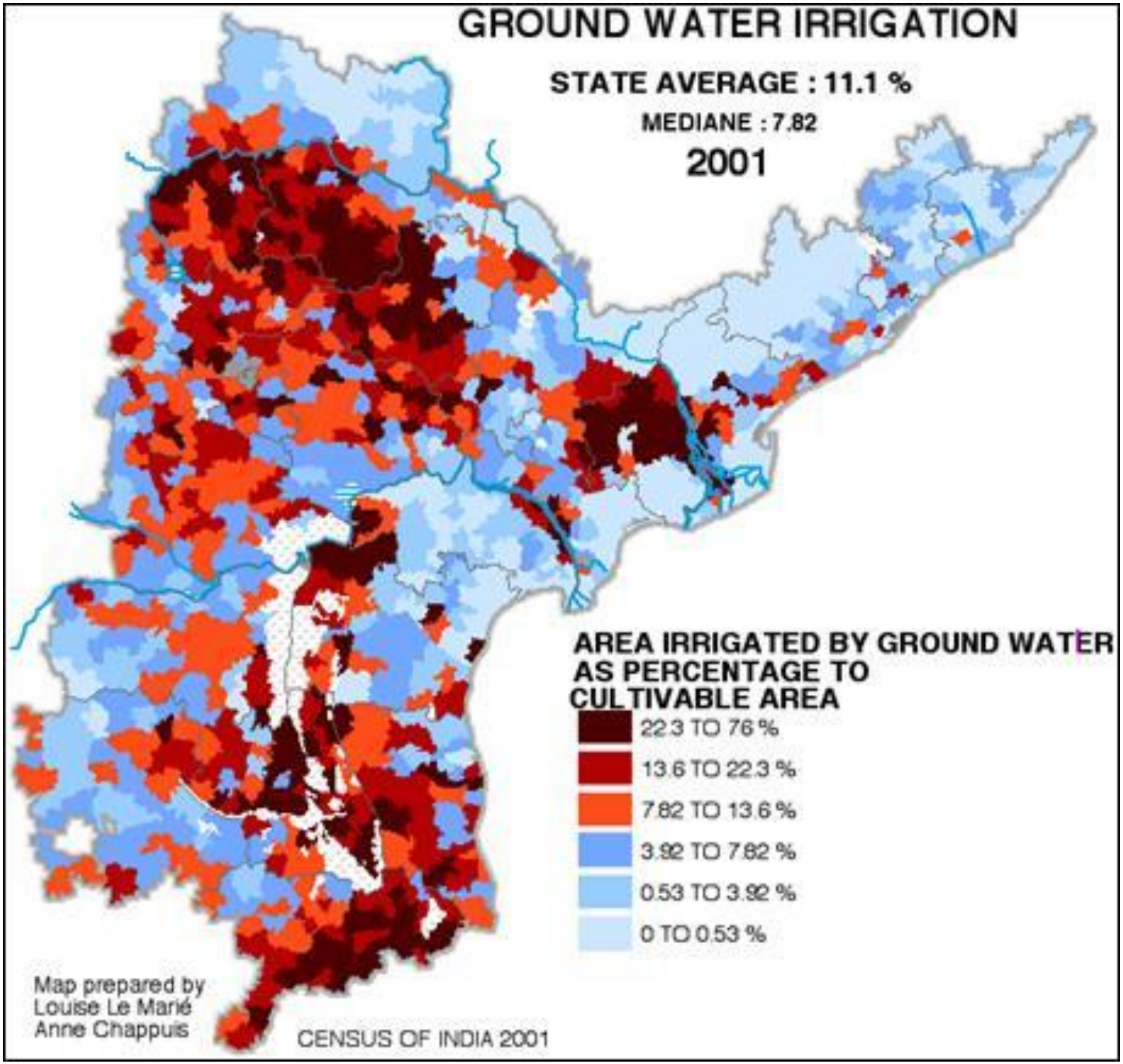
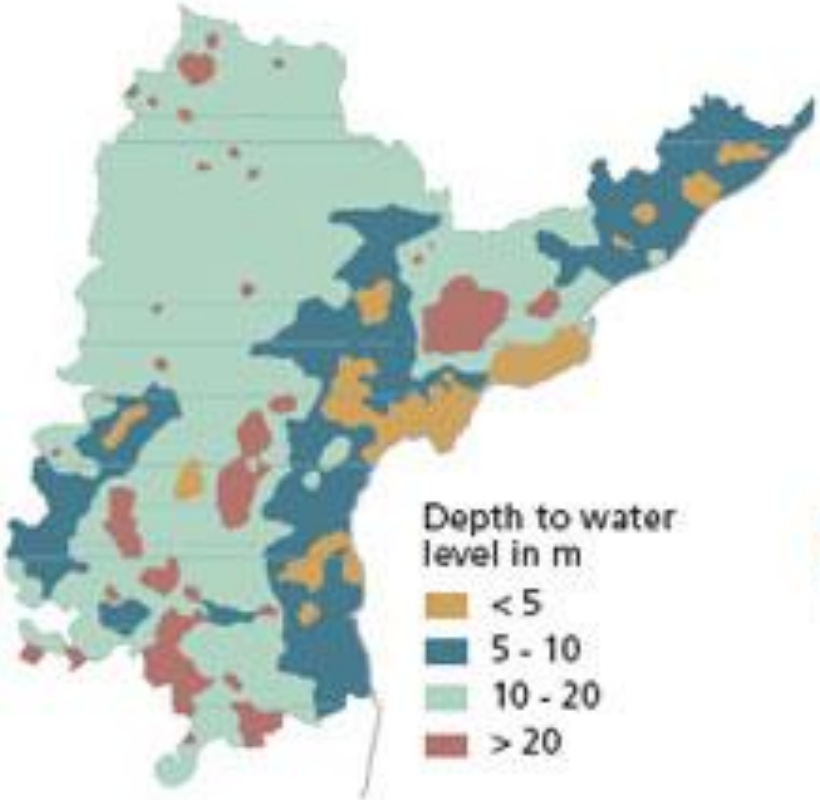
RESEARCH SUBJECT AND THESIS

- Discuss responses to declining levels and worsening quality of groundwater with a broad number of representatives.

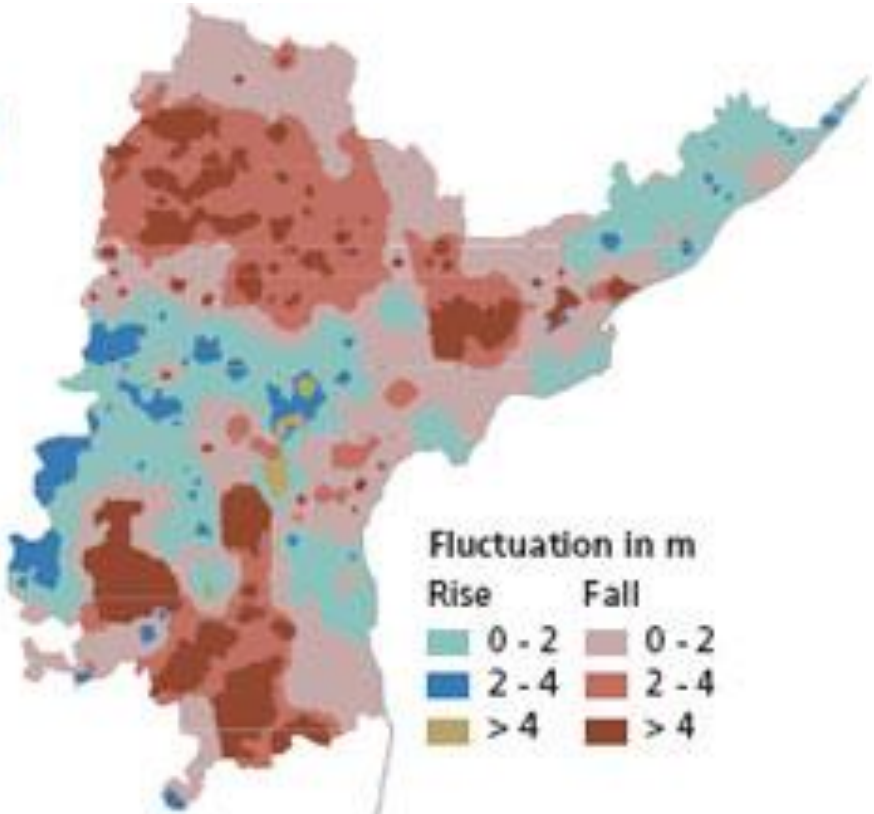
Thesis:

-The policy of free electricity for well irrigation farming since 2004 has in some respects increased the level of economic development of farmers in Andhra Pradesh. But the over-extraction of water outweighs/exceeds the long-term benefits.


GROUND WATER IRRIGATION
STATE AVERAGE : 11.1 %
MEDIANE : 7.82
2001
AREA IRRIGATED BY GROUND WATER
AS PERCENTAGE TO
CULTIVABLE AREA
22.3 TO 76 %
13.6 TO 22.3 %
7.82 TO 13.6 %
3.92 TO 7.82 %
0.53 TO 3.92 %
0 TO 0.53 %
Map prepared by
Louise Le Marié
Anne Chappuis
CENSUS OF INDIA 2001



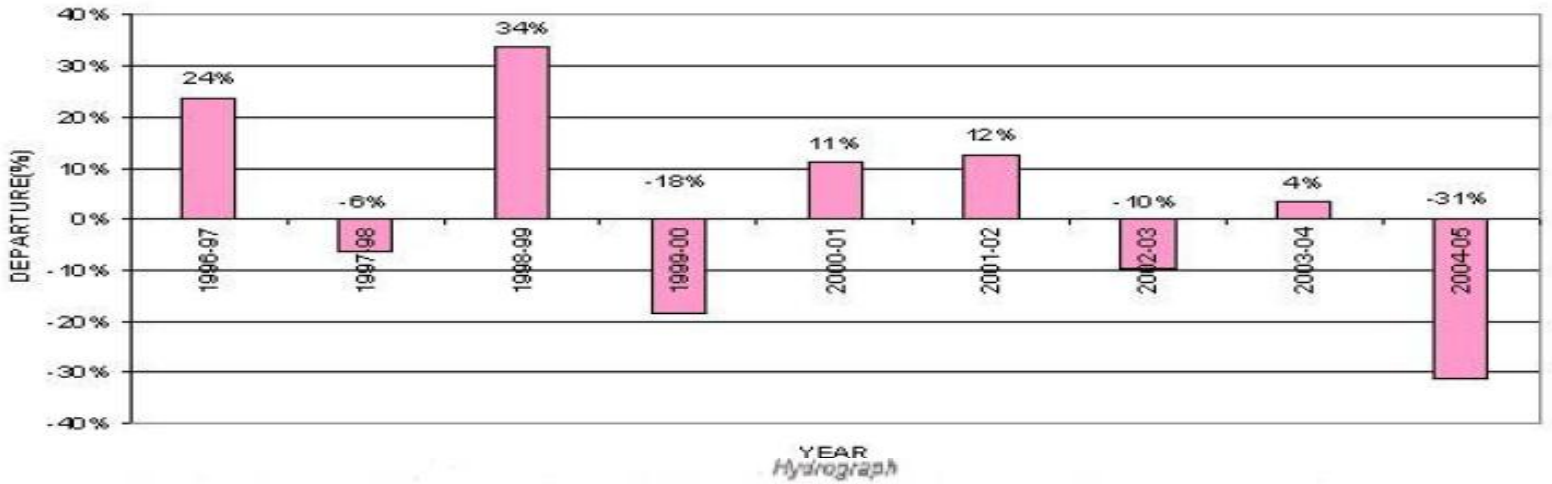
Groundwater level in Andhra Pradesh in May 2010



Groundwater level fluctuations in in May 2009 and May 2010

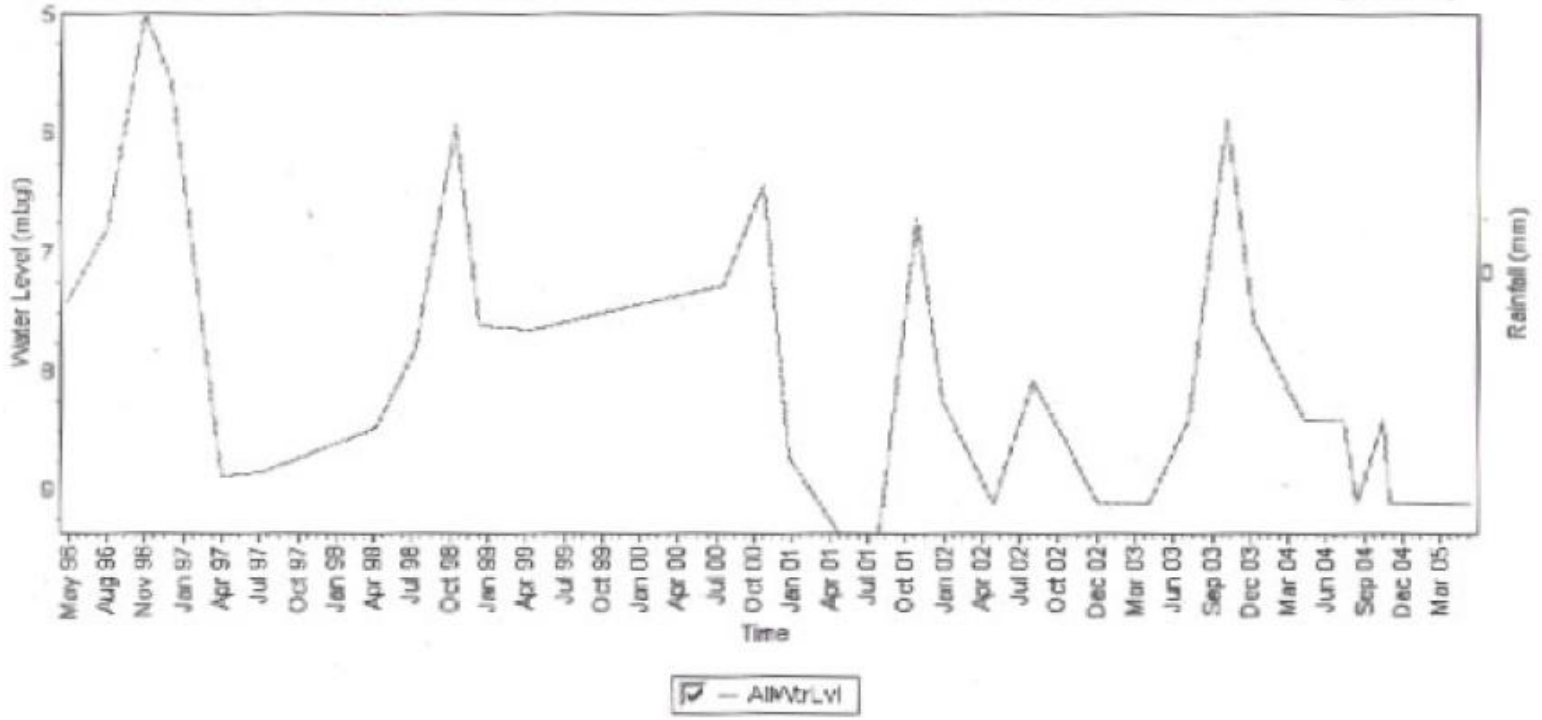
Source: Andhra Pradesh Groundwater Department

RAINFALL DEPARTURE FROM NORMAL, MAHABOOBNAGAR DISTRICT ANDHRA PRADESH



Hydrograph

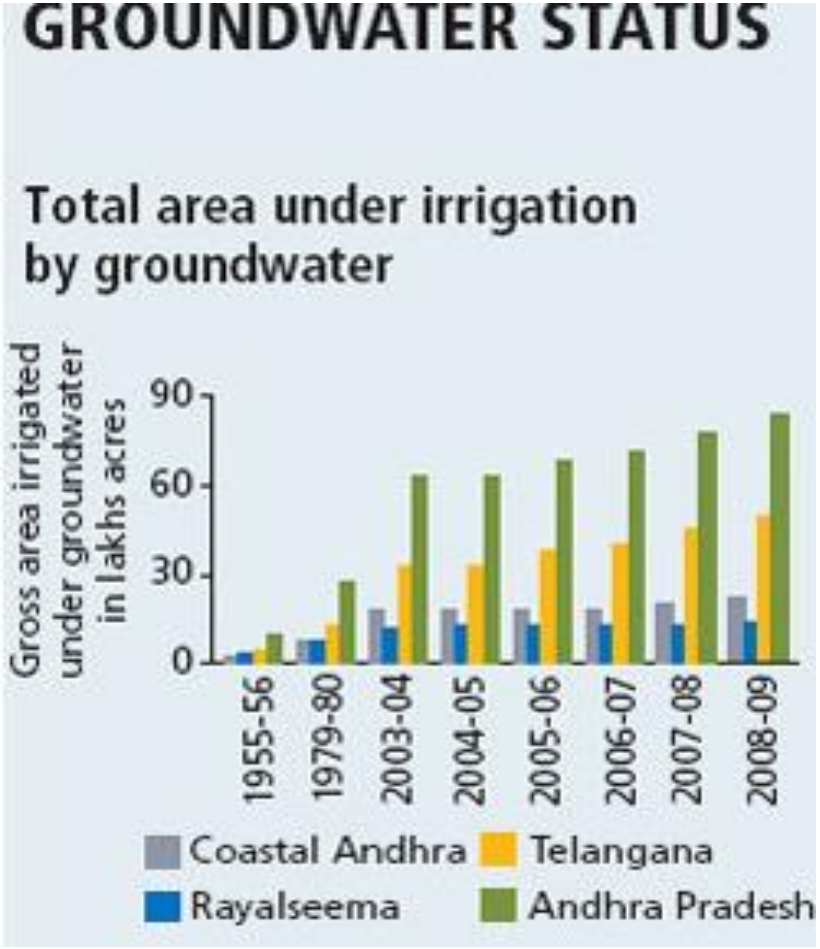
Site Name : Amangal1 State : Andhra Pradesh District : MAHBUBNAGAR Tahsil : AMANGAL Block : AMANGAL Village : Amangal

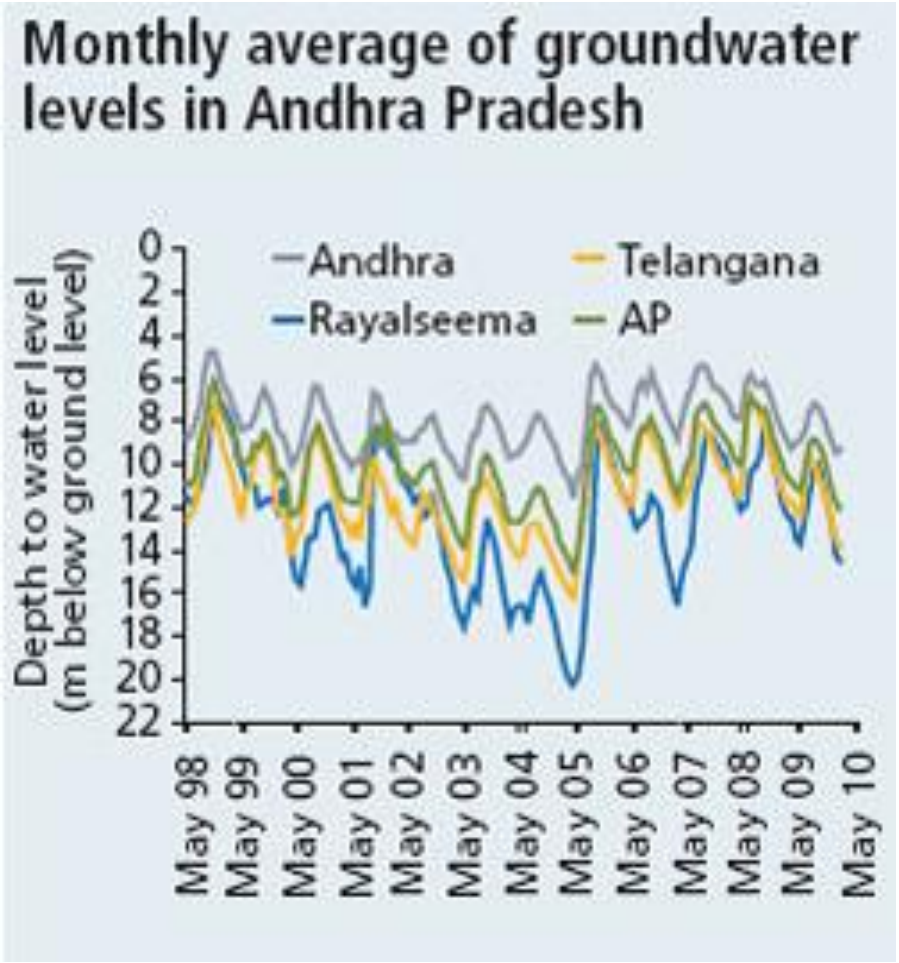


ON AVERAGE ONE QUALITATIVE INTERVIEW EACH DAY

- Research institutions, administrators, field engineers etc, and farmers' organizations, representatives of farmers, state government, the groundwater board, politicians, various professionals.
- Any traceable pattern of a "peak" in the water-extraction?
- Similarity: The peak oil theory.
- In water: Peaks. Renewable resource. But there could be a steady decline in the groundwater table:
- Over-extraction.

A RISE IN GROUNDWATER IRRIGATION





Diminishing yields

Classification of basins

Regions	Safe	SC*	Critical	OE*	Total
Coastal Andhra	367	20	6	11	404
Rayalseema	153	65	41	72	331
Telangana	313	90	42	49	494
State total	833	175	89	132	1,229

*SC: Semi critical; OE: Overexploited

Changing scenario

Years	Type of wells	Yield	Well density /sq km
1982	Dugwells	60 - 150 cu.m	< 5
1983-84	Dugwells/ Dug cum borewells	60 - 150 cu.m	5-10
1984-94	Dugwells/ borewells	40 - 100 cu.m	> 10
1994-98	Borewells/ Dug cum borewells	30 - 60 cu.m	> 15
1998-08	Borewells/ Few dug cum borewells	20 - 40 cu.m	> 20

Source: Andhra Pradesh Groundwater Department

RESULTS BEFORE AND AFTER OVER-EXTRACTION

- Benefits from pump-well irrigation.
- To pay off government loans for a bore-well. Acquire land.
- As water again becomes scarcer, are these initial benefits reversed? Or how are they altered in other ways?

OBJECTIVES

- Discuss conditions for farmers in terms of economic development connected to the policy of free electricity for agriculture, and its long-term benefits, sustainability and credits/indebtedness.
- Access to land, access to bore-wells, access to actual water, access to alternative sources of water, production output, crop types, yields, credits, re-investment and failures during the last 9 years connected to water availability.

OBJECTIVES

- Compare the peaks of water-extraction, in time, with the policy of irrigation.

OBJECTIVES (CONTINUED)

- Discuss the perceived intentions of the policy of free electricity for agriculture in Andhra Pradesh.
- Assess different aspects of this policy, such as economic and ecologic sustainability, whether the government succeeded in their (perceived) intentions.
- Policy results since 2004.

RESEARCH OUTPUT

- 1 20-30 page impact assessment report.
- 1 hour-long power point-presentation based on the findings in the report.
- 1 web-article (in Norwegian) comparing Norwegian and Indian peak-exploitation.
- The final paper of this master's thesis is due in June 2014.