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The Indian Dairy Households through the IHDS surveys (2005 and 2012)

Provisional results

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New Delhi, 17-18 December 2019

Key messages

- **IHDS is a unique 2005 & 2012 survey** of about 42,000 Indian households which can be used to count Indian milk producers and characterize their capitals, incomes and behaviours, from production to consumption
- Compared to available all-India estimates (circa 2012), **IHDS converges**:
 - **well** on Population, Milch cows & buffaloes numbers, Milk consumption
 - **badly** on Pasture area, Goat/Sheep/Poultry numbers, Milk production
- **Milk production in India** is an important (and growing) activity, involving **73 million households in 2012 (30% of total Indian HH)**, representing 404 million people
- When primarily engaged in farming,
dairy households earn more per worker and from agriculture
- But Indian dairy producers are not a uniform whole: we identified **9 archetypes of dairy households** through clustering analyses, mostly differentiated on: geography, education, caste, land, irrigation, labour, income

1 Objectives, Method & Data

■ Objectives

General objective

To better identify and understand who Indian milk producers are using data of the India Human Development Survey (IHDS)

a nationally representative, multi-topic survey

of about 42,000 households (HH) in 1503 villages and 971 urban neighbourhoods across India interviewed during 2 rounds, from Nov. to Oct. 2004-05 (N= 41,554) and 2011-12 (N=42,152)

Sub-objectives / Approach

(0) To **document, check and consolidate** the IHDS databases 2005 and 2012

with new common names of variables, clear definitions and new calculated variables

(1) To **assess the reliability and 'extrapolability'** of IHDS data with estimates from other sources

(2) To **compare households that produce milk with those that do not** on a large range of variables

(3) To elaborate a **typology of Indian milk producers** in 2012 through factorial and cluster analyses (and, later, describe the groups found and their evolution since 2005)

(4) To **link and discuss** our results **with de Agrarian Diagnoses' archetypes**

■ Methods

With the SAS software package:

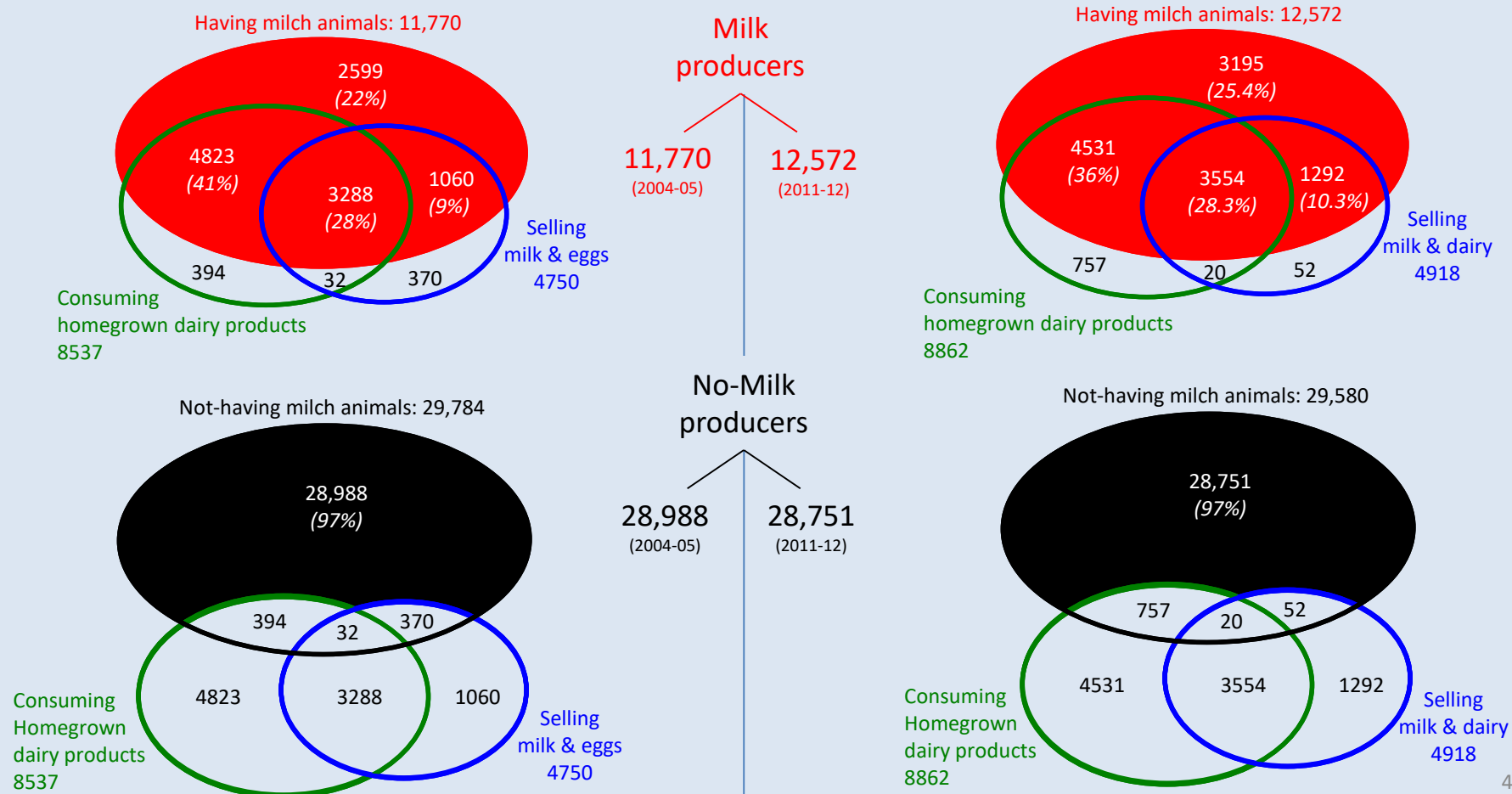
- Management and consistency-check of big database
- Descriptive statistics (*proc freq, proc mean...*)
- Factorial Analyses (*proc factor*) and Multiple Correspondence Analysis (*proc corresp*)
- Conversion into binary matrix (*proc transreg*) and Proximity matrix (*proc distance*)
- Cluster analyses (*proc cluster*: method 2-stage, after tests of ward/centroid/single-linkage/complete & *proc fastclus*)
- Discriminant analysis (*proc discrim*), Logit (*proc logistic*)...

■ Data (1) Livestock censuses, Population censuses, NSSO surveys, Faostat ...

(2) IHDS surveys on Households (HH) (India Human Development Survey: <https://ihds.umd.edu>)

- Rich information: about 1000 variables we renamed and clustered into 8 groups
(Survey info, HH composition, Location, Social capital, Risk, Income, Consumption, Farm)
- Panel data : 2 surveys, in 2004-05 and 2011-12, from Nov. to Oct. (nb: milk lean season = April to Nov)
- Representativeness: about 42,000 HH (% in HH ≈ % in total population) with 83% of Round 1 re-interviewed in Round 2
- Our definition of “Milk producers”

2005 (Round I)
2012 (Round II)
41,554 HH representing 192 million HH
42,152 HH representing 255 million HH, 1212 million people



● Our definition of “Farmers”

Variables	Description	2005	2012	Evolution
	HH surveyed by IHDS:	41,554	42,152	+1.4%
HH_cap._Occupation	HH cap. in occupation category = “Farmers, fishermen, hunters, loggers and related workers”	25,617 (62%)	25,846 (61%)	+0.9%
Land_Yes	HH owning or cultivating crop/plantation land	17,398 (42%)	18,784 (45%)	+8.0%
Land_Cultivated	HH with crops and/or plantations > 0 ha (kharif and/or rabi and/or summer seasons)	16,768 (40%)	16,456 (40%)	+0.0%
Income_Main	HH main source of income = “Cultivation, “Allied agriculture” or “Agricultural Wage Labour”	15,826 (38%)	14,930 (36%)	-5.7%
Farm_Worker	HH members who helped to work on the farm the last 12months > 0	13,380 (32%)	13,419 (32%)	+0.3%

Our selection



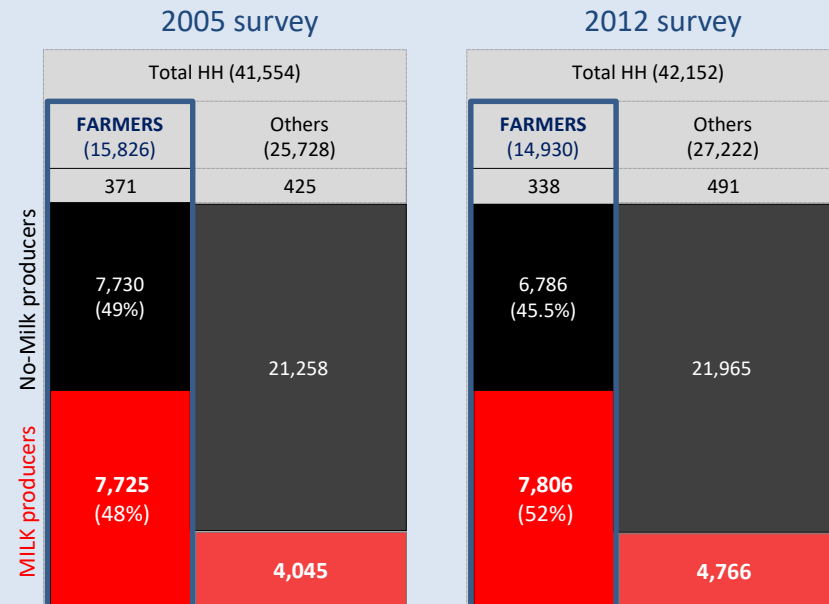
1st main lesson from IHDS data

in 2012:

- 52% of HH primarily engaged in farming (i.e. ‘professional’ farmers) were milk producers (48% in 2005)
- 38% of HH producing milk were not primarily engaged in farming (34% in 2005)
- 30% of total HH produced milk (28% in 2005)



Producing milk in India: an important and growing activity of HH (2005-2012)!!!



1 IHDS estimates compared to some others

(All-India)	Unit	IHDS 11/2011-10/2012	Other	Date	Source
Population	Mcap	1,212*	1,211	31/03/2011	15 th population census 2011
Rural Population	%	68*	69	31/03/2011	15 th population census 2011
Land cultivated (crop + plantation)	Mha	186.8**	144.1	2012	CMIE 2019, from official Indian estimates
Cropped area irrigated	%	64	47	2012	CMIE 2019, from official Indian estimates
Pasture	Mha	5.8**	10.3	2012	CMIE 2019, from official Indian estimates
Tractors	Mtractor	5.3**	2.53	2003	FAOSTAT 2019 (tractors “in use”, latest FAO estimates = 2003)
Farmers as main activity	Mcap	125.4***	182	31/03/2011	15 th population census 2011 (engaged 6 months or more in farming)
			200	07/2011- 06/2012	68 th NSSO round (Primary Status only; PS+SS = 224.4)
Milch buffaloes	Mcap	53.2**	51.0	15/11/2012	19 th livestock census 2012 for ‘Milk’ + ‘Dry’ animals
Milch cows	Mcap	67.3**	67.5	15/11/2012	19 th livestock census 2012 for ‘Milk’ + ‘Dry’ animals
Goats	Mcap	92.4**	135.2	15/11/2012	19 th livestock census 2012
Sheeps	Mcap	16.1**	65.0	15/11/2012	19 th livestock census 2012
Poultry	Mcap	100.6**	718.8	15/11/2012	19 th livestock census 2012
Milk production [#]	Mt	[83.0-73.3]**	127.9	2011-12	CMIE 2019 (65.3 buffaloes + 57.8 cow + 4.8 goat)
			127.9	2011	FAOSTAT 2019 (Milk - Excluding Butter)
Milk consumption	Mt	76.1**	102.8	2012	FAOSTAT 2019 (Milk - Excluding Butter) ²
	Kg/cap	62.8*	64.9	2011	Joshi et al 2016, with NSSO data, for ‘Milk & milk products’
			84.2	2012	FAOSTAT, for ‘Milk - Excluding Butter’ (total Food conso = 102.8 Mt)

* Using household individual integer (HH_Weight_Popu)

** Using sample weight (HH_Weight) *** Using sample weight with HH x farm workers (Farm_Worker)

Estimates with the following assumptions on milk for each HH:

- (1) Production = [Milk sales (INR)]/FarmMilkPrice + [Milk + Milkproduct consumption (INR) from “homegrown” & 9/12 “homegrown & purchased”]/ConsumerMilkPrice ;
- (2) 9 months out of 12 was ‘homegrown’ milk when the HH report to have also consumed purchased milk
- (3) FarmMilkPrice ranged from 18 to 22 INR/liter (nb: in 2011-12, for NDDB Dairy Cooperative Societies, the average milk price was 18.6 for cow, 25.6 for buffalo, and 19.9 for mixed)
- (4) Dividing values of milk products (butter, cheese..) by consumer milk price (liquid) is a fair approximation of quantities in milk equivalent
- (5) 1 liter of milk weights 1.03 kg

2 Dairy households compared to others (2011-12)

* Nominators and denominators extrapolated separately before their division to get the national average

				Prof. Farmers		Others	
Indicator	Main variable used & description	Calculation*	Unit	Milk	No-Milk	Milk	No-Milk
Households (HH)	HH	$(HH * HH_Weight)$	Mhh	46.1	44.9	26.7	132.9
Population	HH	$(HH * HH_Weight_Popu)$	Mcap	255.7	191.3	148.0	595.0
Caste OBC	HH_Religion_Caste – 1.Brahmin 2.High Caste 3.OBC 4.Dalit 5.Adivasi 6.Muslim 7.Skih, Jain 8.Christian	$HH_Religion_Caste (OBC) / HH$	%	44.5	34.5	39.0	33.0
NREGA	Bonus_NREGA_Applied_Yes – NREGA job card application	$Bonus_NREGA_Applied_Yes / HH$	%	10.0	9.0	11.0	5.0
HH size	HH_Size – Number of persons who live under the same roof and share the same kitchen for 6+ months	HH_Size / HH	cap	5.5	4.3	5.5	4.5
Adults	HH_21to99Sex1 – Men in the HH HH_21to99Sex0 – Women in the HH	HH_Adults / HH	cap	3.2	2.6	3.0	2.7
Workers	HH_Worker – Family farm worker, family business and family salaried worker	HH_Worker / HH	cap	2.0	1.1	1.5	1.0
Workers in farming	Farm_Worker – People in the HH who helped to work on the farm the last 12months	$Farm_Worker / HH$	cap	1.8	0.9	0.8	0.1
Workers in breeding	Farm_Workers_Animal – People in HH involved in animal care	$Farm_Workers_Animal / HH$	cap	1.4	0.4	1.3	0.1
Tractors	Farm_Tractor_Own – Tractors owned	$Farm_Tractor_Own / HH$	tractor	0.09	0.01	0.02	0.00
Threshers	Farm_Thresher_Own – Threshers owned	$Farm_Thresher_Own / HH$	thresher	0.05	0.01	0.015	0.00
Bullock carts	Farm_Bullock Cart_Own – Bullock carts owned	$Farm_Bullock\ Cart_Own / HH$	cart	0.16	0.04	0.03	0.00
Gross cropped area	Land_cultivated – Land cultivated (K+R+S)	$Total_Area_cultivated (K+R+S) / HH_Worker$	ha	1.1	0.8	0.4	0.1
		$Total_Area_cultivated (K+R+S) / Farm_Worker$	ha	1.2	1.0	0.8	1.0
Net cropped area	Land_cultivated – Land cultivated (Kharif)	$Total_Area_cultivated (K) / HH_Worker$	ha	0.6	0.5	0.2	0.1
		$Total_Area_cultivated (K) / Farm_Worker$	ha	0.7	1.1	0.4	0.2
Crop intensity	Land_cultivated – Land cultivated (K+R+S)	$Total_Area_cultivated (K+R+S) / Land_cultivated (K)$	ratio	1.9	1.7	1.8	1.8
Land irrigated	Irrigation – Irrigation (K+R+S)	$Total_Area_Irrigated (K+R+S) / Total_Area_cultivated (K+R+S)$	%	71.0	32.0	64.0	20.0

# using HH_Weight_Popu instead of the sample multiplier (HH_Weight)				Prof. Farmers		Others	
Indicator	Main variable used & description	Calculation*	Unit	Milk	No-Milk	Milk	No-Milk
Income	Income_INR – Total Income in a year	Income_INR / HH	INR/y	101,791	63,605	121,616	132,389
	(per capita)	Income_INR / HH [#]	INR/cap/y	116,488	72,456	138,997	146,687
	(per adult)	Income_INR / HH_Adults	INR/cap/y	32,431	25,429	41,627	48,968
	(per worker)	Income_INR / HH_Worker	INR/cap/y	49,486	58,130	80,593	132,161
Farm income	Farm_NET_INR – Family farm income	Farm_NET_INR / Farm_Worker	INR/cap/y	62,849	19,420	25,592	2,245
	(%)	Farm_NET_INR / Income_INR	%	62.0	30.5	21.5	2.0
Non-farm income	Biz_NET_INR – All businesses: Net income per year	Biz_NET_INR / HH	INR/y	62,288	55,091	82,810	106,019
PDS diet	Food_Rice_PDS – PDS Rice in kg/month Food_Wheat_PDS – PDS wheat in kg/month	(Food_Rice_PDS + Food_Wheat_PDS) / HH [#]	Kg/cap/m	12.0	15.0	13.0	11.0
Rice diet	Food_Rice – Rice in kg/month	Food_Rice / HH_Size [#]	Kg/cap/m	5.6	7.6	5.6	5.7
Wheat diet	Food_Wheat – Wheat in kg/month	Food_Wheat / HH_Size [#]	Kg/cap/m	5.3	3.0	5.5	3.8
Cereal diet	Food_Cereal – Other cereals in kg/month Food_Cereal_Product – Cereal_Product in kg	(Food_Cereal + Food_Cereal_Product) / HH_Size [#]	Kg/cap/m	0.9	0.6	0.6	0.4
Pulse diet	Food_Pulse – Pulses in kg/month	Food_Pulse / HH_Size [#]	Kg/cap/m	0.7	0.7	0.7	0.7
Edible oil diet	Food_Edibleoil – Edible oils in liter/month	Food_Edibleoil / HH_Size [#]	l/cap/m	0.7	0.7	0.6	0.8
Egg diet	Food_Egg – Eggs in dozens/month	Food_Egg / HH_Size [#]	doz/cap/m	0.9	1.6	1.1	2.0
Meat diet	Food_Meat – Meat in kg/month	Food_Meat / HH_Size [#]	Kg/cap/m	0.2	0.4	0.2	0.4
Milk diet	Food_Milk – Milk in liter/month	(Food_Milk) / HH_Size [#]	l/cap/m	6.5	2.0	6.2	4.0

2nd main lessons from IHDS data

In 2012:

Indian Households producing milk tend to be (compared to others):

- above all OBC
- with a larger size (5.5 persons)
- and a larger workforce (about 2 adults) to take care of animals (1.4 person)
- with also more farm equipment and area under irrigation

This enabled them to:

- consume more milk (more than 6 liters/capita in a month)
- and, when farming is their main professional activity:
 - earn more per farm worker (63,000 INR/year) and from agriculture (62% of total income)

3 Typology of milk producers

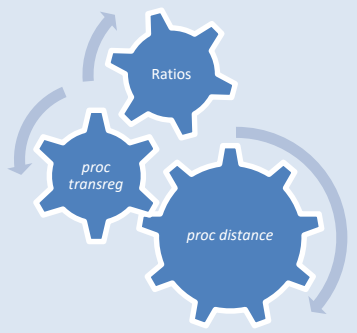
■ The qualitative and quantitative variables used for the clustering analysis

Qualitative variables

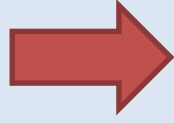
Urbanisation_2001
 Residence in rural or urban area (2001 definition)
 Geo_Location
 Place of residence of the HH (State, district...)
 HH_Religion_Caste
 Religion or Hindu's caste of the HH
 HH_Educated_21to99
 Highest degree obtained by an adult of the HH

Quantitative variables

HH_Size
 People in the HH (capita)
 HH_Head_Sex_Age
 Age of the male or female head (years)
 HH_21to99
 Adults (capita)
 HH_Worker
 Workers in family farm or business, and/or salaried (capita)
 HH_00to14
 Children (0-14 years old) (capita)
 Land_Cultivated
 Land cultivated, own or not (ha)
 Irrigation_Rabi
 Land irrigated in Rabi season (ha)
 Land_Pasture
 Pasture or permanent fallow (ha)
 Farm_Labour_INR
 Money given to farm labourer(s) if any (INR)
 Animal_Milch
 Milch animals, cow or buffalo (head)
 Animal_Feed_Home_INR,
 Value of feed homegrown (INR)
 Animal_Feed_Purchase_INR
 Value of feed purchased (INR)
 Animal_Veterinary_INR
 Expense on veterinary services (INR)
 Income_INR
 Total income (farm, business, wages (INR/year)
 Food_PDS
 Rice + wheat from PDS (kg/month)



Categorical variables



- Urbanisation_2001 (Rural/Urban)
- Geo_Location_Class06 (6 regions)
- HH_Size_Class05
- HH_Head_Sex_Age_Class05 (by sex)
- HH_00to14_Class05
- HH_Religion_Caste
- HH_Educated_21to99_Class05
- Land_Cultivated_Class06
- Land_Cultivated_Irri_PCT_Class05 (%)
- Land_Pasture_Class05
- Farm_Labour_Hired (Yes/No)
- Animal_Milch_Class05
- Animal_Feed_Home_INR_Class05
- Animal_Feed_Purchased_INR_Class05
- Animal_Veterinary_INR_Class05
- Income_INR_PAY_Class05 (per Adult/Year)
- Food_PDS_PCM_Class05 (per Capita/Month)

■ The “average” household producing milk in India in 2012

was **Rural** (95%)

somewhere in **North** (33%), **East** (21%) or **West** (19%) India

with **5.5 members** including **3.2 adults** (above 21 years)

headed by a 46 (female) or 51 (male) years old couple

having **1.65 children** (0-14 years old)

of Hindu **OBC** (43%), **Dalit** (19%) or **Forward** (16%) caste

with **secondary education** (38%)

cultivating **2 ha** that are **irrigated at 66%**

plus **0.07 ha of pasture**

with **hired labour** (55%)

for **1.65 milch animals**

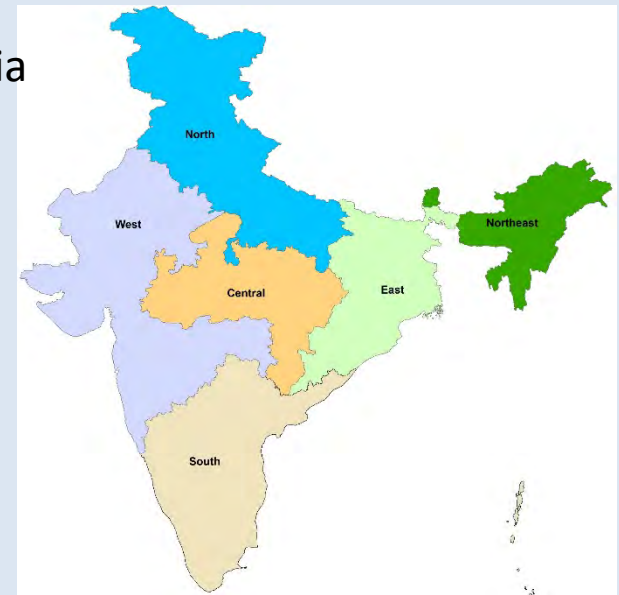
costing 5,480 rupees/year in **animal feed**

and 360 rupees in **veterinary expenses**.

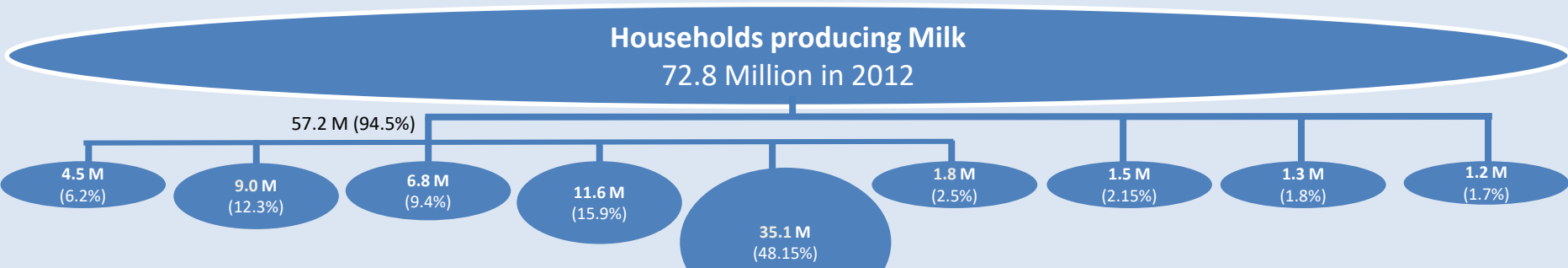
The **total annual income** was **35,800 rupees per adult**,

with **16,100 rupees from farm activities** (45%),

plus **2.5 kg of rice or wheat per capita/month** from the PDS



The clustering results in 2012 *(proc cluster, option 2-stage, after proc transreg and proc distance)*



Archetypes (dominant traits, i.e. over-representation in category distributions)

Rural educated Forward-CSJ with 3.9 ha irrigated (72%) hiring labour (63%) in West,North	Rural educated Brahmin-OBC-CSJ with 3.2 ha irrigated (74%) hiring labour (68%) in North,East,Centre	Rural little educated OBC with 2.4 ha irrigated (67%) hiring labour (72%) in North,West	Rural low educated OBC with 1.6 ha irrigated (66%) hiring labour (55%) in North,East,South	Rural illiterate Dalit with 1.5 ha irrigated (66%) family labour (71%) in North	Rural low educated Adivasi with 2.0 ha rainfed (52%) family labour (92%) in Centre,North	Rural low educated OBC-Dalit with 0.9 ha rainfed (65%) hiring labour (80%) in East,South	Rural low educated OBC with 2.1 ha half irrigated hiring labour (79%) in West	R-Urban low educated Muslim-Forward with 1.4 ha irrigated (71%) family labour (91%) in North,East
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A	B	C	D	E	F	G	H	I
<p>Type A</p> <ul style="list-style-type: none"> Rural (97%) West (40%), North HH size: 7.15 cap Children: 2.1 Forward, CSJ Education 15-16 Land: 3.85 ha Irrigation: 72% Pastoral land: 0.12 ha Labour hired: Yes (63%) Milch Animal: 2.0 Feed home: 3990 INR Feed purch: 3330 INR Veterinary: 530 INR PDS: 1.3 kg/cap Income: 47500 INR/ad. % from farm: 65% 	<p>Type B</p> <ul style="list-style-type: none"> Rural (95%) North, East, Centre HH size: 7.25 cap Children: 2.5 Brahmin, OBC, CSJ Education 15-16 Land: 3.2 ha Irrigation: 74% Pastoral land: 0.05 ha Labour hired: Yes (68%) Milch Animal: 1.9 Feed home: 3290 INR Feed purch: 3100 INR Veterinary: 430 INR PDS: 1.4 kg/cap Income: 40200 INR/ad. % from farm: 56% 	<p>Type C</p> <ul style="list-style-type: none"> Rural (95%) North, West HH size: 5.7 cap Children: 1.5 OBC Education 11-14 Land: 2.4 ha Irrigation: 67% Pastoral land: 0.10 ha Labour hired: Yes (72%) Milch Animal: 2.0 Feed home: 2740 INR Feed purch: 2440 INR Veterinary: 360 INR PDS: 1.9 kg/cap Income: 37900 INR/ad. % from farm: 56% 	<p>Type D</p> <ul style="list-style-type: none"> Rural (95%) North, East, South HH size: 4.9 cap Children: 1.3 Land: 1.6 ha Irrigation: 65.5% Pastoral land: 0.05 ha Milch Animal: 1.6 Feed home: 2470 INR Feed purch: 2690 INR Veterinary: 330 INR PDS: 3.1 kg/cap Income: 30700 INR/ad. % from farm: 42% 	<p>Type E</p> <ul style="list-style-type: none"> Rural (94%) North (39%), N-E (5%) HH size: 5.0 cap Children: 1.5 Dalits Education 00-00 Land: 1.5 ha Irrigation: 66% Pastoral land: 0.07 ha Labour hired: NO (71%) Milch Animal: 1.5 Feed home: 1940 INR Feed purch: 3430 INR Veterinary: 335 INR PDS: 2.9 kg/cap Income: 36200 INR/ad. % from farm: 38% 	<p>Type F</p> <ul style="list-style-type: none"> Rural (97%) Centre (40%), North HH size: 6.0 cap Children: 2.1 Adivasis Education 01-05 Land: 2.0 ha Irrigation: 48% Pastoral land: 0.03 ha Labour hired: NO (92%) Milch Animal: 1.5 Feed home: 1500 INR Feed purch: 1460 INR Veterinary: 140 INR PDS: 3.0 kg/cap Income: 24300 INR/ad. % from farm: 33% 	<p>Type G</p> <ul style="list-style-type: none"> Rural (98%) East (46%), South (31%) HH size: 5.0 cap Children: 1.3 OBC Education 06-10 Land: 0.9 ha Irrigation: 35% Pastoral land: 0.04 ha Labour hired: Yes (80%) Milch Animal: 1.5 Feed home: 1420 INR Feed purch: 1180 INR Veterinary: 215 INR PDS: 3.2 kg/cap Income: 26000 INR/ad. % from farm: 41% 	<p>Type H</p> <ul style="list-style-type: none"> Rural (97%) West (37%) HH size: 6.4 cap Children: 1.6 OBC Education 06-10 Land: 2.1 ha Irrigation: 52.5% Pastoral land: 0.06 ha Labour hired: Yes (79%) Milch Animal: 1.6 Feed Home: 3300 INR Feed purch: 3220 INR Veterinary: 800 INR PDS: 1.8 kg/cap Income: 25100 INR/ad. % from farm: 43% 	<p>Type I</p> <ul style="list-style-type: none"> R-Urban (9%) North (37%), East (34%) HH size: 7.4 cap Children: 2.4 Muslims, Forward Education 06-10 Land: 1.4 ha Irrigation: 71% Pastoral land: 0.06 ha Labour hired: NO (91%) Milch Animal: 1.5 Feed home: 1750 INR Feed purch: 4500 INR Veterinary: 320 INR PDS: 1.8 kg/cap Income: 25400 INR/ad. % from farm: 24%

Descriptive analysis of the 9 groups

Red: significantly higher

Blue: significantly lower

Variables	Modalities	All	A	B	C	D	E	F	G	H	I
		100%	6.20%	12.31%	9.40%	15.90%	48.15%	2.50%	2.04%	1.80%	1.70%
Urbanisation (Urbanisation_2001)	Rural	94.85	96.58	95.37	95.23	94.78	94.21	97.40	98.12	96.72	91.34
	Urban	5.15	3.42	4.63	4.77	5.22	5.79	2.60	1.88	3.28	8.66
Location (Geo_Location_class06)	North	33.29	31.81	33.60	28.59	26.48	38.62	28.47	7.05	11.71	36.94
	East	20.71	14.49	25.74	18.13	20.66	19.55	12.89	46.12	22.82	33.54
	West	18.77	40.34	16.04	21.81	16.64	16.95	9.34	10.00	37.23	18.61
	South	12.47	6.23	7.69	13.56	18.68	12.13	6.13	31.06	13.54	1.39
	Centre	10.81	5.27	15.48	14.87	13.09	7.74	39.58	3.06	11.92	6.48
	North East	3.95	1.86	1.44	3.04	4.45	5.01	3.59	2.70	2.78	3.04
HH Size (HH_Size_class05) capita	]00-03]	18.86	8.91	7.34	18.61	23.09	23.70	3.25	14.20	6.57	4.61
	]03-04]	18.12	5.66	9.91	18.22	25.09	20.46	7.56	20.04	6.97	6.54
	]04-05]	19.66	12.62	13.43	18.30	22.51	21.46	21.06	25.31	21.67	9.43
	]06-07]	26.02	35.41	28.56	24.48	18.04	24.28	57.31	27.22	44.45	38.77
	]07-above]	17.34	37.40	40.75	20.38	11.26	10.10	10.83	5.23	20.33	40.65
Female Head Age (HH_Head_Sex0_Age_class05) year	[00-30]	19.57	12.06	23.65	14.39	15.73	23.21	12.59	18.28	3.46	7.45
	]30-40]	20.47	5.23	17.21	18.93	29.64	19.59	34.49	39.15	21.43	3.29
	]40-47]	18.72	16.23	14.23	16.60	25.14	18.29	24.83	29.98	11.49	9.17
	]47-55]	21.48	17.75	15.15	33.67	18.79	19.83	15.06	9.06	59.44	70.37
	]55-above]	19.77	48.73	29.75	16.41	10.71	19.07	13.03	3.53	4.18	9.72
Male Head Age (HH_Head_Sex1_Age_class05) year	]00-34]	18.8	9.4	12.33	11.91	15.34	25.32	14.71	11.9	6.86	12.94
	]34-44]	19.77	7.4	20.22	19.22	25.4	19.2	29.66	31.54	12.41	7.34
	]44-50]	19.46	13.68	16.89	16.41	27.4	18.11	26.79	42.03	18.57	2.7
	]50-60]	21.92	20.33	16.96	34.52	18.45	19.66	19.73	11.93	57.64	68.61
	]60-above]	20.05	49.19	33.6	17.94	13.4	17.71	9.11	2.61	4.52	8.41
Children (HH_00to14_class05) capita	[00]	30.28	20.10	16.17	32.44	38.49	34.35	6.39	32.77	16.28	12.47
	]00-01]	21.46	21.18	16.57	22.34	24.89	20.64	22.68	29.27	41.53	11.59
	]01-02]	22.05	23.49	19.84	23.61	15.91	22.49	42.69	19.83	22.36	41.32
	]02-03]	14.25	16.73	21.39	11.48	14.88	12.56	14.20	13.52	13.33	12.42
	]03-above]	11.96	18.50	26.04	10.13	5.82	9.96	14.03	4.61	6.50	22.19
Religion/Caste (HH_Religion_Caste)	Brahmin	6.19	4.20	7.95	6.74	5.68	6.53	4.01	3.90	2.34	2.85
	Forward	16.20	33.05	15.10	18.30	18.05	13.29	11.14	11.91	19.05	25.65
	OBC	42.63	33.47	54.29	50.38	41.81	38.92	45.05	54.05	48.95	37.48
	Dalit	18.98	13.33	9.68	10.94	16.91	24.76	14.79	20.95	16.03	13.85
	Adivasi	7.40	5.67	6.11	5.70	9.95	7.03	20.87	4.94	7.38	1.98
	Muslim	7.33	8.20	4.66	6.44	6.50	8.37	3.77	3.96	5.48	18.20
	Christian, Sikh, Jain	1.27	2.08	2.21	1.49	1.10	1.09	0.37	0.29	0.79	0.00
Adult Education (HH_21to99_Educated_class05) level	Illiterate (0)	19.21	10.00	11.54	10.38	21.22	24.39	19.32	14.71	7.56	9.13
	Primary (1-5)	14.54	9.90	13.15	9.00	14.38	16.71	21.79	8.24	7.99	16.12
	Secondary (6-10)	38.32	36.95	36.68	42.55	41.87	34.76	44.49	57.79	51.81	52.95
	High Secondary (11-14)	15.75	22.48	16.92	26.64	12.07	14.29	12.92	6.20	21.08	8.03
	Graduate & above (15-16)	12.18	20.68	21.70	11.44	10.46	9.84	1.48	13.06	11.55	13.78

Land Cultivated (Land_cultivated_class06) <i>hectare</i>	No Land	5.76	0.64	1.67	2.01	1.50	11.16	3.76	0.39	0.10	18.53
	Marginal (<1ha)	42.26	27.88	26.39	32.40	54.05	46.40	50.26	73.02	23.19	48.37
	Small (1-2 ha)	22.80	16.89	24.77	19.75	21.79	23.81	28.63	19.09	38.72	10.97
	Semi-Medium (2-4 ha)	16.86	27.16	25.60	31.81	13.27	10.29	13.41	3.67	25.97	11.64
	Medium (4-10 ha)	9.68	20.32	15.89	12.52	7.35	6.62	2.78	3.83	11.17	8.12
	Large (>10 ha)	2.65	7.13	5.69	1.50	2.03	1.72	1.16	0.00	0.85	2.38
Land Irrigated (Land_cultivated_Irri_PCT_class05) <i>% of cultivated land</i>	[0]	27.47	19.14	18.79	28.15	28.35	27.60	47.65	61.39	40.71	27.50
	]0-50]	4.29	6.00	6.06	3.65	4.18	3.93	2.36	0.64	5.43	0.26
	]50-70]	5.78	8.25	5.33	4.97	5.93	5.72	4.57	6.35	6.77	1.25
	]70-100[	4.84	7.82	6.17	5.06	4.08	3.96	7.29	2.67	2.16	13.80
	]100-above]	57.62	58.79	63.65	58.18	57.47	58.79	38.13	28.96	44.93	57.19
Land Pasture (Land_Pasture_class05) <i>hectare</i>	No Land	89.51	88.90	91.63	90.96	92.39	87.61	90.24	87.89	89.02	81.40
	]0-0.1 ha[	2.03	0.43	1.49	1.21	1.25	2.96	2.72	4.41	0.74	0.93
	]0.1-0.25 ha[	3.10	3.10	2.34	2.35	2.05	3.74	4.50	3.78	3.24	7.83
	]0.25-0.70 ha[	2.82	2.53	2.82	2.27	2.20	3.22	0.97	2.14	2.89	9.71
	]0.70-above ha]	2.54	5.04	1.73	3.21	2.10	2.47	1.57	1.77	4.11	0.13
Farm Labour Hired	No	54.98	36.64	31.87	27.92	45.34	71.31	92.19	19.84	21.03	90.66
	Yes	45.02	63.36	68.13	72.08	54.66	28.69	7.81	80.16	78.97	9.34
Animal Milch (Animal_Milch_class05) <i>head</i>	]00-01]	60.37	47.31	45.41	37.73	62.07	68.61	68.23	69.11	61.04	69.46
	]01-02]	26.35	27.76	34.89	42.49	27.60	21.13	19.12	20.52	27.30	23.45
	]02-03]	7.65	15.39	11.71	11.02	5.48	6.22	4.79	3.57	6.64	2.18
	]03-04]	3.20	5.06	4.41	5.57	2.72	2.26	7.05	3.64	2.56	3.63
	]04-above]	2.36	4.48	3.59	3.19	2.13	1.77	0.80	3.16	2.45	1.28
Animal Feed Homegrown (Animal_Feed_Home_INR_class05) <i>INR / milch animal / year</i>	[0]	22.52	14.02	9.23	11.51	17.13	31.16	22.77	15.54	8.34	39.93
	]0-900]	19.78	15.64	19.34	22.63	20.85	19.22	28.40	26.90	7.74	19.75
	]900-2000[	17.82	10.74	14.99	21.31	17.95	18.98	11.86	27.38	14.82	11.39
	]2000-4000]	23.51	29.53	32.84	24.44	26.91	17.77	31.48	26.80	50.03	15.26
	]4000-above]	16.37	30.07	23.61	20.11	17.16	12.87	5.49	3.37	19.07	13.66
Animal Feed Purchased (Animal_Feed_Purchased_INR_class05) <i>INR / milch animal / year</i>	[0]	23.88	25.93	22.20	29.48	35.26	18.86	47.00	21.50	14.87	11.57
	]0-1000]	23.72	13.41	26.88	19.44	17.62	26.67	17.62	54.91	9.52	22.61
	]1000-2800]	19.90	27.50	19.33	24.70	17.95	18.08	21.89	13.21	41.41	21.81
	]2800-5500]	16.26	16.34	15.83	15.51	14.40	17.78	7.53	6.27	19.85	18.40
	]5500-above]	16.24	16.82	15.76	10.86	14.78	18.62	5.96	4.11	14.35	25.61
Animal Veterinary Expenses (Animal_Veterinary_INR_class05) <i>INR / milch animal / year</i>	[0]	44.71	29.72	38.20	40.40	45.13	48.83	62.16	40.55	27.47	47.42
	]0-190]	13.30	9.41	15.41	19.54	13.46	11.89	17.19	15.08	9.52	12.32
	]190-300]	13.58	11.58	14.49	14.72	13.83	13.60	9.86	13.84	14.45	9.16
	]300-600]	14.18	25.27	13.83	13.62	13.51	13.08	6.33	24.43	13.84	16.03
	]600-above]	14.24	24.02	18.07	11.72	14.08	12.60	4.47	6.10	34.72	15.06
PDS Rice-Wheat (Food_PDS_PCM_class05) <i>Kg / capita / month</i>	[0]	52.49	69.90	62.69	57.91	48.11	50.00	37.66	26.48	49.72	52.32
	]0-3]	12.17	9.46	16.56	14.16	8.76	11.00	7.01	24.01	29.61	19.89
	]3-5]	12.10	11.30	11.00	11.70	12.93	11.43	24.03	20.07	8.76	13.17
	]5-7]	13.35	6.51	7.66	10.26	13.88	15.23	28.25	20.45	8.51	13.40
	]7-above]	9.88	2.83	2.09	5.97	16.32	12.35	3.05	9.00	3.39	1.22
Total Income (Income_INR_PAY_class05) <i>INR / adult / year</i>	<=0	2.56	1.98	1.85	2.21	3.11	2.63	0.95	3.20	3.40	5.36
	]0,15,000]	28.90	27.83	25.21	27.79	33.98	27.16	40.34	35.31	41.75	29.44
	]15,000-27,000]	27.20	20.70	25.99	24.40	24.50	29.38	29.70	33.16	26.33	29.06
	]27,000-50,000]	23.31	21.25	24.72	25.42	22.86	23.39	19.54	20.72	17.13	26.45
	]50,000-above]	18.03	28.38	22.23	20.19	15.54	17.45	9.46	7.61	11.39	9.69
Farm Income (Farm_Income_INR_PAY_class05) <i>INR / adult / year</i>	<=0	18.3	11.24	12.34	11.59	17.57	22.07	19.32	17.73	12.51	30.18
	]0-4,000]	22.83	13.88	16.93	18.73	24.35	24.72	34.45	30.02	21.17	29.58
	]4,000-10,000]	21.69	22.57	21.36	20.35	22.83	21.3	22.91	21.52	31.54	16.2
	]10,000-23,000]	20.53	21.54	23.54	25.05	19.97	19.08	17.51	21.66	22.54	17.29
	]23,000-above]	16.65	30.77	25.84	24.29	15.28	12.83	5.81	9.08	12.24	6.75

3rd main lesson from IHDS data:
dairy households are not a uniform whole, be careful with averages and complete with field surveys!

4 Discussion: linkage with AD archetypes?

- Agrarian Diagnoses in 5 Indian States (AP, BI, GU, KA , WB) led to the following general typology (2014-2019):



- Quantification/representativeness of each AD archetype?
(to be processed in 2020)

Thank you for your attention !

