

**Inclusion and Technology Design**  
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**Lecture - 09**

**Inclusion in designing ICT for Development projects: Who [should] matter?**

So, if for example, if you start if you keep on questioning the internet yeah if you keep on questioning search engines right, their acceptance yeah their would be certain political positions. So, it would not lead or it would not easily lend to its acceptance yeah, but when you ingrain it and you start making it a habit. So, that is you do not question because that is what culture is you do not question it yeah.

So, when does a practice become your culture? When you do not question it, when work for the thing that you are doing you do not question why you are doing and let us in the inverse of certain that is what I am saying certain political groups yeah and these political groups could be in the government. They could be outside the government, they could be in the corporate sector, they could in the not of corporate sector it could be everywhere right.

So, it is an interest of certain political formations to move technologies from the realm of politics to main (Refer time: 01:27) tools ok. Now, so what we are trying to look at today is again looking at developments works looking at development and government projects and trying to understand inclusion. And, even though the abstracts that are work a lot of sectors we will focus only on agriculture right and we will focus on agriculture for obvious reasons; other part will be probably explained that (Refer time: 02:06).

(Refer Slide Time: 02:10)

On 6 October 2015, Professor Stephen Hawking conducted a special Reddit "Ask Me Anything" session. One of the questions was on technological unemployment:

**[Question]**

Have you thought about the possibility of technological unemployment, where we develop automated processes that ultimately cause large unemployment by performing jobs faster and/or cheaper than people can perform them? Some compare this thought to the thoughts of the Luddites, whose revolt was caused in part by perceived technological unemployment over 100 years ago. In particular, do you foresee a world where people work less because so much work is automated? Do you think people will always either find work or manufacture more work to be done? Thank you for your time and your contributions. I've found research to be a largely social endeavor, and you've been an inspiration to so many.



Stephen Hawking was mentioned these things alright agree with, Stephen Hawking is the he passed away recent October then October 2015 he was a Reddit kind of "Ask Me Anything" event and this keeps on happening here (Refer Time: 02:29) and at that eminent scientist who speak or to answer the questions. So, here he gets so, one of the questions that was asked in October 2015 related to technological unemployment yeah.

Let me read it out. Have you thought about the possibility of technological unemployment, where we develop automated processes that ultimately cause large unemployment by performing jobs faster and or cheaper than people can perform them? Right as they go they again it goes on to talk about Luddites in particular do you foresee a world where people work less because so much work is automated.

Do you think people will always either find work or manufacture work to be done yeah. So, this is the question that someone asked. So, when the contexts of automation of jobs and it is a vacations for (Refer time: 03:32) gain employment across the world.

(Refer Slide Time: 03:38)

**Answer [Prof. Stephen Hawking]:**

If machines produce everything we need, the outcome will depend on how things are distributed. Everyone can enjoy a life of luxurious leisure if the machine-produced wealth is shared, or most people can end up miserably poor if the machine-owners successfully lobby against wealth redistribution.



**So far, the trend seems to be toward the second option, with technology driving ever-increasing inequality.**

[https://www.reddit.com/r/science/comments/3nyn5l/science\\_ama\\_series\\_stephen\\_hawking\\_ama\\_answers/?st=jerkraov&sh=1ef87b47](https://www.reddit.com/r/science/comments/3nyn5l/science_ama_series_stephen_hawking_ama_answers/?st=jerkraov&sh=1ef87b47)

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This is what his answer was right. If machines produce everything we need, the outcome will depend on how things are distributed. Everyone can enjoy a life of luxurious leisure if the machine-produced wealth is shared, or most people can end up miserably poor if the machine-owners successfully lobby against wealth redistribution yeah.

But from the contexts of this talk what is more important is this. So, far the trend seems to be toward the second options with technology driving ever increasing inequality right. So, this is what.

Student: The second paragraph part of the book.

This is emphasis added from me (Refer time: 04:26) the answer is this as a complete answer it just emphasizes here, but this is what the answer is and it is still there in that Reddit tape. So, if you go and have a look at he did not get the chance say have a need you understood the comments that (Refer time: 04:47) at (Refer time: 04:48) answer, but this is what a fact.

Student: Yeah.

And he was a person who has been at the cutting edge of science. So, he speaks one of the beneficiaries of technology and this is what he had to say. What you feel is technology driving more inequality today in the world?

Student: Why given from the ancient world (Refer time: 05:18) used at like.

Even from the ancient world it swing that.

Student: Model once they already said where is today we can (Refer time: 05:27) the (Refer time: 05:29) we can talk of everybody right. So, literally they were all present in usual things.

Student: And today so they were technology which is still literally they were available. So, overall whether we occupation right now whether we use the (Refer time: 05:50).

Hope that is recognised.

Student: A person who were asking how it is close related to the roots of production that how we produce and what we produce depends on the type of technology you have and that depends on the type of investment we can use. So, person with the certain amount of capital they want to invest in the technology and so here we will see somebody who is already (Refer time: 06:15) with the later investing more on technologies to create much more wealth. So, this income in a (Refer time: 06:22). So, this kind of use of technology.

So, yesterday when we started talking about technology you said technology is (Refer time: 06:34) technology. So, we find it better yeah. So, why should it always lead to or why should it lead to inequalities.

Student: (Refer time: 06:45).

(Refer time: 06:46).

Student: (Refer time: 06:48).

The reason.

Student: (Refer time: 06:49).

Ok, so who is Luddites.

Student: There is there is the consumptions then there is production.

Student: So, the consumption here can group with the in consumers point of view maybe needed or may not be needed. So, jobs are created primarily in production.

Student: Now, production consumption may become (Refer time: 07:21) work for Wal-Mart and there is the same type you work for Wal-Mart and you better consume Wal-Mart products and that is how product cycle should go (Refer time: 07:34).

Student: I feel we look at production consumption maybe.

Several issues in the production consumption whatever like that (Refer time: 07:43) using.

Student: (Refer time: 07:45) they do this one. It is not that everyone must see people access to (Refer time: 07:57).

(Refer time: 07:58).

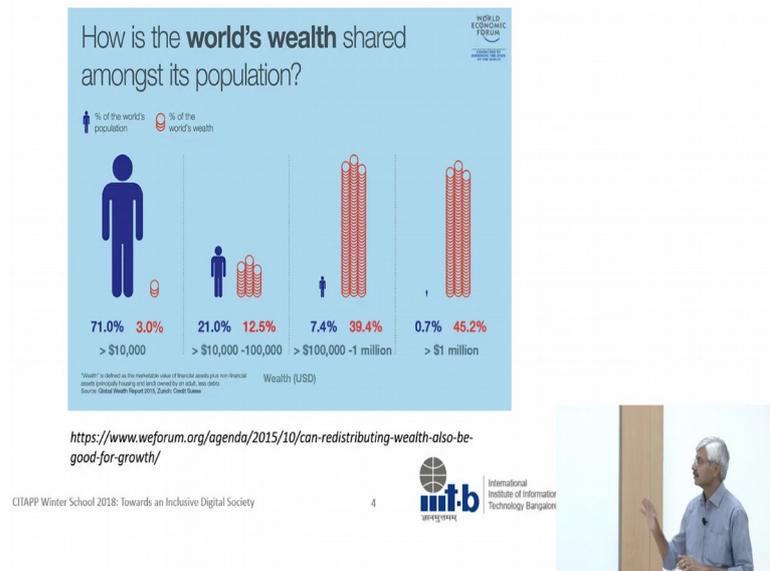
Had it also say whom homes. So, that is it in the regular access. So, who has access to that?

Student: Access in person. Some people have older technology (Refer time: 08:12) derive in the (Refer time: 08:14).

What is the people who produces talking. So, who produces technology also matters. So, if the technology is produced, but hopefully (Refer time: 08:24) produce probably (Refer time: 08:26) yeah they may not we say. Yeah. Who produces. So, Google producing the technology for artisans versus Kosha producing technology for artisans so, it also.

Yeah. So, who produces matters consumption you will see who consumes matter, but who produces also matter. And, I think the first from the first state even the second is research highlighted that women are missing in technology production and therefore, they are missing out on consuming the benefits that arise out of technology. Now, who produces matters and who produces and who produces will have an effect on who consumes and for what and if there is a disconnect there inequalities will rise yeah. So, let us quickly do ok.

(Refer Slide Time: 09:24)



So, some numbers I thought just to substantiate what Professor Stephen Hawking was saying. So, what it have on the slide here is a graphic from the world economy forums 2015 data and what it says is the world's wealth is shared, but it talks about how the world's wealth is shared amongst its population. So, the blue symbols here they are the percentage of world's population. So, what it says is 71 percent world's population has 3 percent of the world's wealth in 2015.

And that is less than or equal to 10,000 dollars correct. 0.7 percent of the world's population have access to 45 percent of the world's wealth which is greater than or equal to 1 million dollar right. So, in terms of concentration on wealth in recent times we say it is highly concentrated. A very small percentage of world's population have ownership of most of the world's wealth right.

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So, that was with respect to wealth. This is the global information technology industry, this is 2016 year. So, this is 2016 data, there is a world map here and bubbles corresponding to how much is a particular region consuming or how much is a particular region spending on consuming information technology year. And, by information technology they mean hardware, software services and telecommunication right.

And, what this shows is North America consumes 34 percent or they spent total of the total 3.4 trillion dollars spent on information technology. In 2016 North America spent 34 percent, Western Europe spent 23 percent and 28 percent was the entire Asia Pacific of which a large part was Japan, China, Korea all that year. So, we will focus on North America and Western Europe; these have been the highest consumers of information technology in the recent years right.

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Now, this is a map of United States and this is the map that was put out by the occupy Wall Street movement the people. What does map does is it has divided the entire landmarks of United States into 4 or 5 areas and almost 50 percent or maybe more than 50 percent of United States if it were to be divided on the basis of wealth that is owned would be owned by only 1 percent of its population yeah.

The remaining say two-thirds I would say would be owned by 9 percent. So, 10 percent would own close to 60 percent of the wealth in United States. 40 percent would own a small little dot right. So, in the entire map of United States 40 percent would own a small little dot right and United States has been one of the largest consumers of information technology in recent years.

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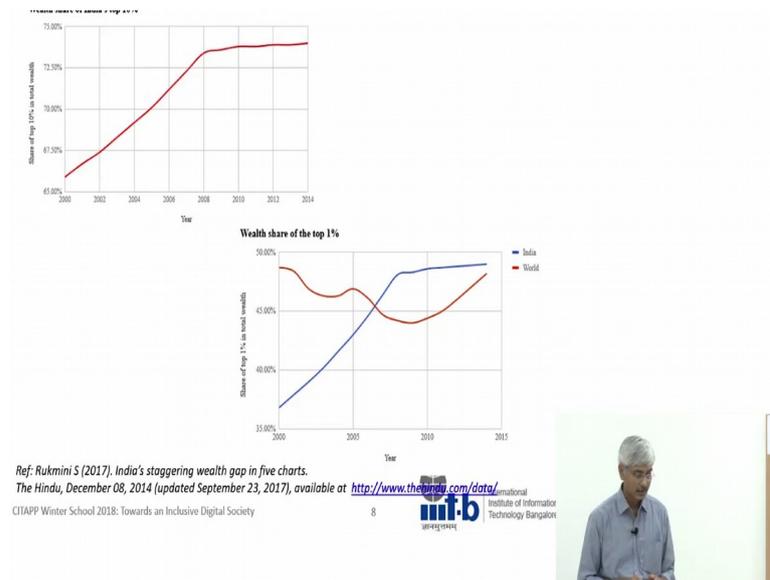


This is UK yeah. So, another large consumer of information technology in recent years and this is again 2016 data; what the graphic says is it is a pound sterling there and that has it is actually a pie chart. So, that has been divided into 3 sectors the biggest. So, and what it says is of the gain in of the increase in wealth in UK over a 15 year period from 2000 to 2015 26 percent of that increase went to the richest 1 percent yeah and 7 percent went to the poorest 50 percent.

So, in a 15 year period the increase in wealth in UK went to the top 1 percent one-fourth of the entire increase in wealth in UK went to the top 1 percent and the bottom 50 percent were able to a portion only 7 percent of the increase in this world. So, what do what does this 0.2. So, we will looking at in terms of inequality in the world.

There is less than 1 percent of the people almost close to half of the world's wealth. In terms of informations, in terms of regions which have been consuming a lot of information technology. You know North America, US and UK the way they have consumed now these are correlations yeah and they are not very statistically difficult, what they are going or it is the same period of that is increase in consumption of information technology, there is increase or there is a large concentration of wealth and income that is happening right.

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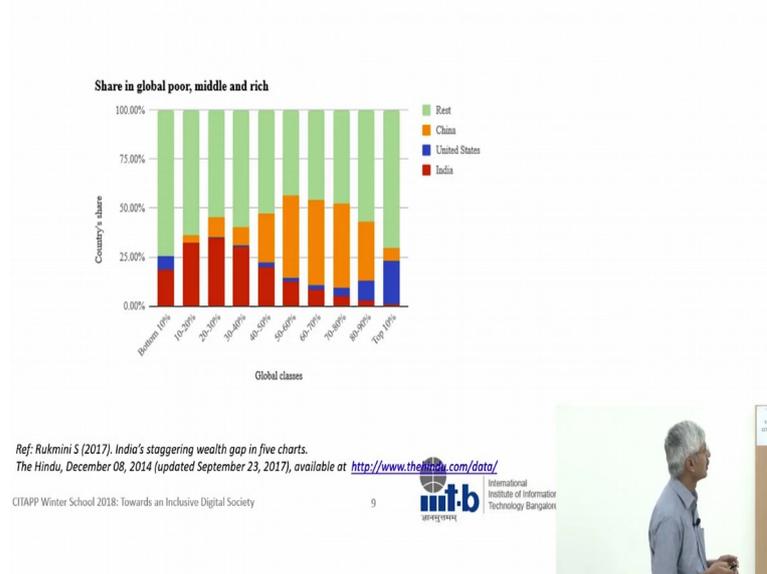
This is what that is happening in India. I have 2 graphs one of the graph shows the wealth share of India is about 10 percent. So, what it says is on 2000 when it was close to two-thirds. In 2014 it has gone up to three-fourths yeah. So, from a figure of roughly around 66 percent in 2000; today this is up to 2014 the wealth share of India's top 10 percent has gone up to about 74 percent right the.

74 percent of wealth.

Total wealth. So, the total wealth in the country is of the total wealth that Indian's have 74 percent is with the top 10 percent. So, only 10 percent of the people have access to 74 percent of the wealth in India right. In terms of 1 percent the world average between 2000 and 2014 has been slightly less than 50 percent. So, it actually went down in 2010 around that recession period 2007-8, but it has been say around 46, 47, 48 percent the world average.

In terms of India this has actually gone up from 30 close to 36 percent in 2002, close to 50 percent in 2014 right. So, the Indian wealth concentration has been increasing over a last 14 15 years.

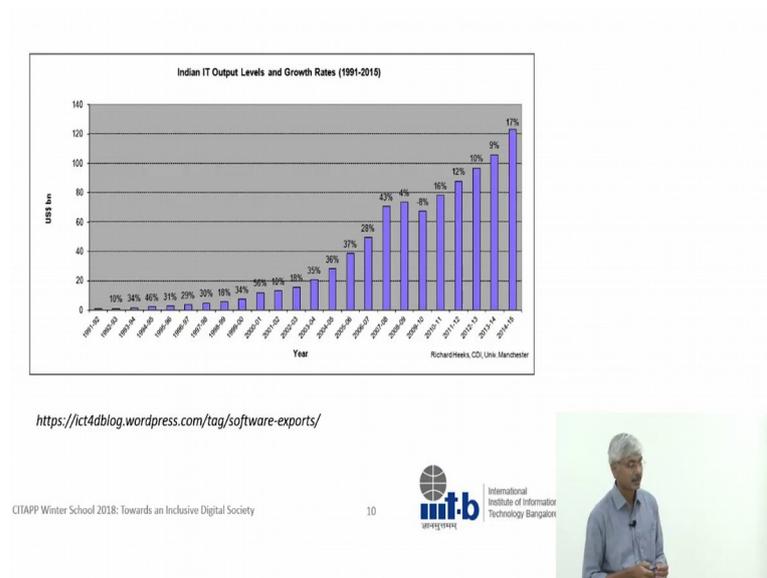
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In terms of distribution in different say at; if you look at again this is wealth concentration India is home to most of the world's poor yeah. So, sorry. This one the red ones here yeah that is India you will see that most. So, it is around 10 percent 10 to. So, India has the highest proportion in these.

So, we are home to the world's poor in terms of wealth right. China is the world's middle class and obviously, US and North Western Europe is where the wealth is concentrated.

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Now, we looked at how wealth concentration is moving in India and this is how the IT industry revenues have grown over the last 15 years. So, we see that the IT revenues or revenues or say contribution of the information technology sector to the country's GDP has been growing.

Concentration of wealth has been growing yeah in India and more or less across the world we see a lot of wealth concentration while a lot of IT consumption is also going on right. So, these are some data points which I thought I will highlight to substantiate what Professor Stephen Hawking was talking about ok.

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### **class**

a system that divides members of a society into sets based on social or economic status

a set in a society based on social or economic status

*(Oxford English Dictionary)*

a group of people sharing common relations to labour and the means of production *(Karl Marx)*



So, Vidhisha had asked me to focus on class. So, this is what we will be looking at. So, we will look at class the Oxford dictionary says it is a system that divides members of a society into sets based on social or economic status. So, the focus here is economic status we are not looking at caste, here we are more looking at economic status. There is a large correlation between your economic status and your social status, but then there are it is not causal yeah. So, Marx has said that a class is a group of people sharing common relations to labour and means of production.

So, taking these definitions we will look at farmers in India and try to understand what are the concerns they have with respect to whatever they are doing and within the farming community we are looking as small holder. So, the focus would be on small holders, some of you may have followed recent marches in Mumbai and Delhi by

farmers and which means that this is the group of people who have some genuine concerns who are willing to march, who are willing to go out and see if someone can would be willing to listen to their voices ok.

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**NABARD All India Rural Financial Inclusion Survey 2016-17**

- NAFIS was launched in 2016-17 as a national level survey that offers a comprehensive overview of the rural population in terms of their status of livelihoods and level of financial inclusion.
- Survey coverage: 29 States, 245 Districts (Tier 3 to Tier 6 Centres as per RBI Classification), 40,327 HHs
- Survey period: January 2017 – June 2017

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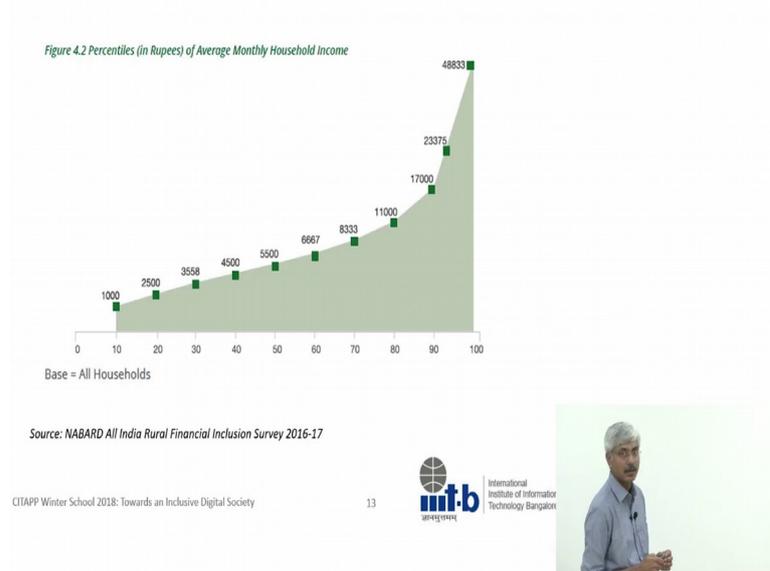
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Again some more data, this data is I am sorry I will not after this we will go into, we will not have more numbers, but this is an All India Rural Financial Inclusion Survey that NABARD conducted in 2017 January 2017 to June 2017 is when this survey was conducted. The results came out this year I think April or May this. The survey was a national level survey and it offers a comprehensive overview of the rural population in terms of their status of livelihoods and level of financial inclusion.

It covered 29 states 245 districts and it looked at Tier-3 to Tier-6 terms as per RBI classification which means terms with the population of less than 50,000 right and the survey was conducted in approximately 40,000 households.

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Now, this chart what it says is percentile of average monthly household income year of all the households who were part of this survey; of all the households in these Tier-3 to Tier-6 towns 48 percent are classified as agricultural households, 52 percent are classified as non-agricultural households. An agricultural households are those households which have had an income of at least 5,000 year in the preceding years every month through agriculture, assuming we consider those who live in Tier-3 to Tier-6 kind of towns and villages as rural population.

48 percent of the rural households are agricultural households, 52 percent of the rural households are non-agricultural households as per the classification. This is all the households in rural areas. The monthly household income ranges from 1,000 to roughly about 50,000 year. So, this is the monthly household income. This is the 10th percentile. So, 1,000 is the 10th percentile 48,000 is roughly about 98 or 99 percentile year. So, that is how the and you will see that beyond see around 88th percentile after that it goes up pretty quickly.

Student: The 10 percent of the people survey households survey.

Sorry.

Student: The next as 10 percent the household survey have an average of 1,000.

Yes yeah. So, the bottom 10 percent so, when you stacked all these households in terms of their monthly incomes 10 percent will be less than 1,000, 20 percent will be less than 2500, 30 percent will be less than 3550.

Student: And, this is only for agricultural households.

This is all households. So, these this is what all rural households of which 48 percent are agricultural households, 52 percent are non-agricultural households. So, this is all rural households.

Student: Does it include any income support by government as well?

That includes all forms of incomes.

Student: (Refer time: 24:38).

Yeah ok.

(Refer Slide Time: 24:41)

Source of Income	Agricultural Households	Non-agricultural Households	All Households
1	2	3	4
Cultivation	3140 (35%)	NA	1494 (19%)
Livestock Rearing	711 (8%)	NA	338 (4%)
Other Enterprises	489 (6%)	851 (12%)	679 (8%)
Wage Labour	3025 (34%)	3940 (54%)	3504 (43%)
Govt/ Pvt. Service	1444 (16%)	2326 (32%)	1906 (24%)
Other Sources	122 (1%)	152 (2%)	138 (2%)
All Sources Combined	8931 (100%)	7269 (100%)	8059 (100%)

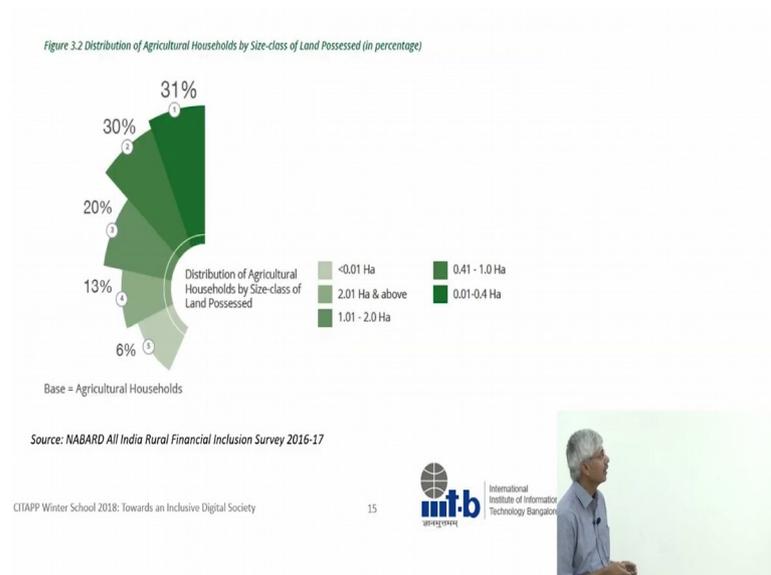
Source: NABARD All India Rural Financial Inclusion Survey 2016-17



So, I think I have that clip. So, it includes these as sources of income cultivation, livestock rearing, other enterprise, wage labour that is why NREGA will come in government private service yeah. So, if they are any engaged in any of these, any forms of salaried employment and other sources. So, all sources of income is what it is looking at, for households in rural areas and rural areas are areas which have population of less than 50,000 right. So, this is what it is when you look at the average monthly household

income it comes to 8,931 for agricultural households, 7269 for non-agricultural households and I am if you take an average gross score its roughly about 8,000. So, this is 2017 yeah 2017 numbers.

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So, that is in terms of income, in terms of in the agricultural households in terms of size class of land possessed we see that roughly 13 percent of all the agricultural households have land that is more than 2 hectares right; 87 percent of households have these are agricultural households have land that is less than 2 hectares yeah. So, 87 percent and then there are classifications we can see that 31 percent is 0.01 to 0.4 hectare, 30 percent is 0.41 to 1 hectare. So, less than 1 hectare is on 60 percent right and when we talk of small holders we are talking of 60 to 70 percent of all agricultural households in rural areas.

Student: (Refer time: 26:39) this issue with the graph yeah first gray is should be more hectares or else.

See this less than 0.01 hectares these may have homestead plots yeah. So, that is why it looks like an out lapped, what we should more be concerned with are.

Student: Yeah.

These 3 numbers 1 2 3 4 ok.

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**Table S.4 Average Monthly Income and Consumption Expenditure per Household by Decile Class of MPCE (In Rupees)**

Decile Class of MPCE	Agricultural Households		Non Agricultural Households		All Households	
	Income	Consumption Expenditure	Income	Consumption Expenditure	Income	Consumption Expenditure
1	2	3	4	5	6	7
Overall	8931	7152	7269	6187	8059	6646
1	1293	2465	793	1899	1019	2156
2	3033	3591	2498	3008	2753	3286
3	4963	4793	3800	4173	4330	4456
4	5970	5711	4728	4841	5342	5271
5	7475	6596	6231	5558	6881	6101
6	9856	7118	7011	6246	8484	6697
7	9781	7584	7836	6500	8817	7047
8	12012	8847	9169	7305	10449	7999
9	13702	10393	10639	8716	11981	9426
10	22269	15134	19175	13149	20548	14090

Source: NABARD All India Rural Financial Inclusion Survey 2016-17

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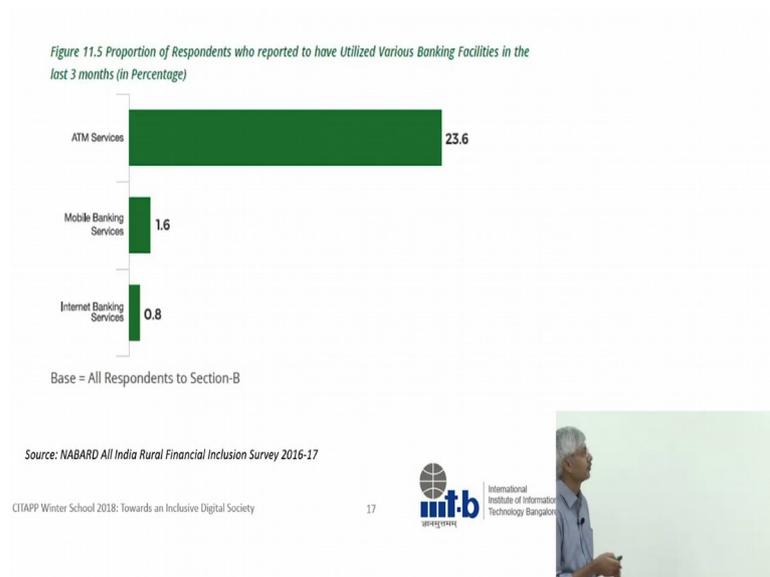

This is average monthly income and consumption expenditure per household. So, income we saw yeah and this is also consumption expenditure.

Student: Sir if you were look at it this is visible then.

Sorry the font size is low for this is how it is yeah. So, agricultural households the income is 8,931, consumption expenditure is 7,152, non-agricultural households average income is 7,269, consumption expenditure is 6,187 right and this consumption expenditure is on food and non-food items right. Now what is interesting is this. So, if you look at the 10th.

So, the bottom 10 households in terms of their income their income is 1,293 is the average income, the consumption expenditure is 2,465 yeah. For non-agricultural households this is 793 is the income, consumption expenditure is 1,899 per month right. And, that deficit exists even for the second decile roughly around the third decile you achieve parity here. So, 30 percent of these households in rural areas are not able to meet their monthly consumption expenditure through their regular source of income right ok.

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And this may not be very relevant, but I was tempted to put this out because this was survey was conducted in January 2017 just after the.

Student: Demonetization.

Demonetization (Refer Time: 29:01). So, sorry this is what was there, was the financial behaviour in terms of the ATM services 23 percent of the rural households that accessed ATM services, 1.6 percent had accessed mobile banking services and 0.8 percent had accessed internet banking services right.

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ICTs in Agricultural Markets  
[Sanjay V.P.]

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So, I will leave you with that and then I will request Sanjay to talk about his work on agricultural markets.