



Asia-South Pacific Education Watch

EDUCATION WATCH TOOLKIT

A RESOURCE PACK
FOR EFA RESEARCH
AND MONITORING

Module 5: The Wealth Index

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The Asia South Pacific Association for Basic and Adult Education (ASPBAE) is a regional association of more than 200 organisations and individuals working towards promoting quality education for all and transformative and liberating, life-long adult education and learning. It strives to forge and sustain an Asia-Pacific movement dedicated to mobilising and supporting community and people's organisations, national education coalitions, teachers' associations, campaign networks, and other civil society groups and institutions in holding governments and the international donor community accountable in meeting education targets and commitments, ensuring the right of all to education, and upholding education as an empowering tool for combating poverty and all forms of exclusion and discrimination, pursuing sustainable development, enabling active and meaningful participation in governance, and building a culture of peace and international understanding.

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Education Watch Toolkit
A Resource Pack for EFA Research and Monitoring

Asia South Pacific Association for Basic and Adult Education (ASPBAE)

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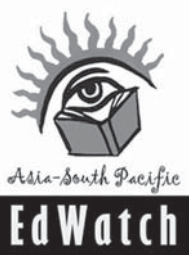


Asia South Pacific Association
for Basic and Adult Education
Learning Beyond Boundaries

EDUCATION WATCH TOOLKIT

A RESOURCE PACK FOR EFA RESEARCH
AND MONITORING

Module 5: The Wealth Index



OTHER MODULES IN THE SERIES

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Acronyms

ASPBAE – Asia South Pacific Association for Basic and Adult Education

CAMPE – Campaign for Popular Education (Bangladesh)

CSO – Civil Society Organization

EdWatch – Education Watch

EFA – Education for All

E-NET - Education Network for Justice (Indonesia)

E-Net Philippines – Civil Society Network for Education Reforms (Philippines)

MICS – Multi-Indicator Cluster Survey

NSO – National Statistics Office

UNESCO – United Nations Educational, Scientific and Cultural Organization

UNICEF – United Nations Children’s Fund



Thai children on way to school

The Wealth Index

THE REGIONAL CONTEXT

The EdWatch studies conducted in eleven countries across Asia-Pacific noted that poverty weighs heavily on the education of the poor. The poor have less access to education; have lower school life expectancy; and are more likely to drop out before completing primary school. Every year, millions are pushed out of school and lost to child labour. An overwhelming majority of youth and adult illiterates come from poor and socially-excluded families. Illiteracy rates are highest in the countries with the greatest poverty, a link observed even down to the household level. The lack of education and literacy deprive the poor of the necessary faculties, skills, and creative competencies to cope with and transform their conditions. Poverty is, thus, perpetuated and regenerated.

Monitoring poverty and its impact on education is particularly important in the Asia-Pacific region where 60% of the world's poor reside. While economic growth in the region has been rapid in the last two decades, it has failed to address inequality and ensure sustainable growth. The unprecedented rise in food and fuel prices, amidst continuing conflicts and worsening disasters, have eroded the gains in fighting poverty

with impact on education especially among the poor and in emergency-affected areas. Women bear a disproportionately higher burden of poverty. They are the last to be sent to schools and literacy classes and the first to be pulled out to cut on family expenditure and help in domestic chores and livelihood.

The lack of information on the poor adds further to their marginalisation. Whether deliberate or not, they tend to be ignored and bypassed because they are hidden and unaccounted for. ASPBAE's EdWatch initiative seeks to address this gap by ensuring that the poor and other socially-excluded groups are made visible and are counted. The studies were designed to locate the poor, understand their particular circumstances and hear out their voices.

For the EdWatch studies, one of the indicators used to monitor poverty and its impact on education is the "*Wealth Index*". The index serves as a proxy for income or economic status and is particularly useful in the absence of household poverty surveys and data.

ASPBAE encourages the replication of its monitoring initiatives, noting the importance of addressing the education and literacy needs of the poor to meet the EFA goals.

THE WEALTH INDEX

In the absence of data on household income or consumption expenditure, asset ownership and housing amenities may be used to assess the economic status of households. Referred to as the wealth index, this tool is a good proxy for monitoring poverty and education. Two coalitions (Campaign for Popular Education, Bangladesh and E-Net Philippines) used this methodology in ASPBAE's EdWatch initiative with good results.

Using wealth as a measure of household economic status has the advantage of being more permanent compared to either income or consumption. The wealth index is easy to generate and requires fewer questions compared to the volume of data required in doing household income or expenditure survey. The index is a powerful measure which can help identify the poor and present the poverty situation.

Construction of the wealth index involves several steps:

- 1) Determining the wealth or asset variables to be included in the measure;
- 2) Assigning scores to the wealth variables, which in most cases is either 1 if asset or amenity is present or 0 if absent;
- 3) Calculating the weights for each of the wealth variables;
- 4) Computing the index;
- 5) Determining categories of households based on the index, such as the wealth quintile or classifying households as poor or non-poor.

The Wealth Index Instrument: Checklist of Wealth or Asset Variables

Culling from the experiences and results of the EdWatch surveys conducted in Bangladesh and the Philippines, the following list of household assets/amenities is recommended as a guide for constructing the questionnaire to generate the corresponding wealth index:

- Household amenities/durables: electricity, radio, television, refrigerator, telephone, mobile phone, computer, stove, washing machine, DVD, stereo
- Housing characteristics: main material of dwelling (for floor, walls and roof); number of rooms in dwelling; main source and proximity of drinking water; type of toilet facility
- Ownership status of dwelling unit (rented, owned, etc.)
- Ownership of farmland/agricultural land and area
- Ownership of transportation: bicycle, motorcycle, car, motorized boat, other motorized vehicles
- Employment of domestic worker/house helper

For countries that have not yet tested this methodology, it will be useful to conduct a pretest of the wealth index Instrument to check for validity and adjust certain asset items, ensuring that the methodology is appropriate to the particular country or area context.

Methodology

The Philippine EdWatch study utilised the methodology developed by the Philippine National Statistics Office in generating the Socio-economic Index (Orbeta, 2003). This approach, hereinafter referred to as the NSO methodology, may be considered as a variant and simpler version of the approach first used by Filmer and Pritchett (1998) in India to study the effect of household economic status on educational outcomes without direct survey information on income or expenditure.

The NSO methodology uses asset variables such as electricity, water, toilet, radio, television, mobile phone, computers, motor vehicles and other consumer durables to generate the index. In the EdWatch approach, additional asset variables were considered such as housing characteristics and ownership.

A value or score is assigned to each asset variable - 1 if asset or amenity is present and 0 if absent. Toilet facilities are assessed either as sanitary (with a score of 1) or unsanitary (score is 0). Safe drinking water is either accessible or within house premises (score is 1) or outside house premises (score is 0). Houses are likewise assessed either as durable (score is 1) or non-durable or made of light materials (score is 0).

Child worker in Nepal - too poor to be in school, Photo by Child Workers in Nepal Concerned Centre (CWIN)



Corresponding weights are then computed and assigned to each asset variable. The NSO methodology computes the weight as the inverse of the proportion of households possessing the particular asset. That means that the more expensive the asset variable is, the wealthier a household needs to be to be able to acquire such an asset. The highest weights are given to the least possessed asset items. Assets that are more commonly owned by households such as radio and clock will have smaller weights and, conversely, assets owned by fewer households such as car and washing machine will have larger weights.

The total score for each household is computed by adding the corresponding weighted scores of the asset variables. Households are then ranked according to the total score (wealth index) of the household in ascending order to determine the relative economic status of families covered by the survey.

Formula for Computation (NSO Methodology)

The wealth index corresponding to the total weighted scores of the j^{th} household is computed as follows:

$$A_j = (1 - \bar{a}_1) * a_{j1} + \dots + (1 - \bar{a}_N) * a_{jN}$$

Where,

Number of households = 1... j

Number of Wealth or Asset Variables = N

a_{j1} = the score of j^{th} household for the asset variable #1 (this is either 0 or 1)

\bar{a}_1 = the proportion of household possessing asset variable #1 (or the mean of the household scores which can either be 0 or 1)

$(1 - \bar{a}_1)$ = weight of the asset variable #1 (computed as the inverse of the proportion of households possessing asset variable #1)

The resulting wealth index (total weighted score) is used as proxy for economic status. The wealth index can be grouped into quintiles for tabular analysis with education performance indicators. A further grouping may be done to classify individual economic status as poor or non-poor based on the official or estimated poverty line. For non-tabular analyses, such as correlations and difference of means, the individual household score or wealth index can be used directly.

Measuring economic status using the wealth index facilitates the identification of poor households and individuals. It also enables comparisons to be made between the poor and non-poor in terms of key education indicators – access, performance, outcome, knowledge, practices and attitude. More extensive analysis can be done using individual household scores and the wealth quintiles.

A simple hypothetical example is presented in table 1 below with the top scores highlighted.

Table 1. Hypothetical Example of Wealth Index Computation (NSO Methodology)

Household Number (J)	Asset Variables (0 if absent; 1 if present)			Weighted Scores of Asset Variables			Wealth Index
	a_1 =Radio	a_2 =TV	a_3 =Car	$a_{j1} * (1 - \bar{a}_1)$	$a_{j2} * (1 - \bar{a}_2)$	$a_{j3} * (1 - \bar{a}_3)$	
1	1	0	0	0.20	-	-	0.20
2	1	1	1	0.20	0.40	0.70	1.30
3	0	1	0	-	0.40	-	0.40
4	1	0	0	0.20	-	-	0.20
5	1	0	0	0.20	-	-	0.20
6	1	1	0	0.20	0.40	-	0.60
7	0	1	1	-	0.40	0.70	1.10
8	1	0	0	0.20	-	-	0.20
9	1	1	0	0.20	0.40	-	0.60
10	1	1	1	0.20	0.40	0.70	1.30
Mean (\bar{a})	$\bar{a}_1 = 0.8$	$\bar{a}_2 = 0.6$	$\bar{a}_3 = 0.3$				
Asset Variable Weight ($1 - \bar{a}$)	0.2	0.4	0.7				

In this example, the wealth index is derived from three assets (radio, TV and car) owned by the households. The corresponding weights of the wealth or asset variables are given in the last row. Note that radio has the lowest weight (0.2) because it is the most common possession of the households. Car, on the other hand, has the highest weight at 0.7 because only 3 households own cars. The wealth index is presented in the last column, showing that those who own cars have the highest wealth index. On the other hand, households who own only radio have the lowest wealth index.

E-Net Philippines EdWatch Survey

Table 2 presents an actual example of computing the wealth index using the NSO methodology based on data generated from the EdWatch survey in one municipality in the Philippines. Assets and amenities such as landline telephone, personal computer, farm tractor, motorized boat, car, jeep and van are the least owned and, therefore, have the highest weight factors.

**Table 2. Actual Wealth Score Computation, EdWatch Survey, 2006.
Toboso, Negros, Philippines**

	Min	Max	Mean	Weight Factor
Source of drinking water	0	1	0.349	0.651
Toilet facility	0	1	0.633	0.367
Housing tenure	0	1	0.280	0.720
Electricity	0	1	0.671	0.329
Radio/radio cassette	0	1	0.598	0.402
Television	0	1	0.468	0.532
Landline telephone	0	1	0.042	0.958
Cellular phone	0	1	0.378	0.622
Washing machine	0	1	0.108	0.892
Refrigerator/freezer	0	1	0.231	0.769
Compact Disc/DVD players	0	1	0.308	0.692
Component/karaoke	0	1	0.258	0.742
Personal computer	0	1	0.035	0.965
Farm Tractor	0	1	0.009	0.991
Motorized boat	0	1	0.095	0.905
Car/jeep/van	0	1	0.044	0.956
Bicycle/pedicab	0	1	0.172	0.828
Materials used in walls	0	1	0.430	0.570
Materials used in roof	0	1	0.565	0.435

A total of 2,114 households were covered by the survey. The wealth index is computed for each household by adding the weighted scores for assets or amenities owned. The values of the wealth index ranged from .37 to 13.33 with a mean of 3.295. The poorest households are those having the lowest wealth index values.

Principal Components Analysis

The methodology developed by Filmer and Pritchett constructs a linear index that serves as proxy for household economic status derived from a set of asset indicators. In this approach, the weights assigned to the asset indicators were determined by the statistical procedure of principal components analysis (which is closely related to

factor analysis). The asset index was found to be robust and correlate strongly with poverty incidence among households. The methodology has been validated using data from Indonesia, Pakistan and Nepal. The method has broad application, allowing the examination of the impact of economic status on a wide range of education and health outcomes.

The asset index for each household (A_j) is computed based on the formula:

$$A_j = f_1 * \frac{(a_{j1} - \bar{a}_1)}{s_1} + \dots + f_N * \frac{(a_{jN} - \bar{a}_N)}{s_N}$$

Where,

f_1 is the “scoring factor” or weight for the first asset as determined by the statistical procedure principal components analysis;

a_{j1} is the j^{th} household’s value for the first asset;

\bar{a}_1 and s_1 are the mean and standard deviation of the first asset variable over all households.



Training of survey interviewers, Toboso, Negros (E-Net Philippines)

The wealth index has been used and applied in several countries, including several South and East Asian countries, to assess economic status of households. UNICEF’s Multi-Indicator Cluster Survey (MICS) and Macro International’s Demographic and Health Survey (DHS) have generated the wealth index using this principal components analysis in their surveys since the 1990s. The index has been found to be a robust measure of economic status, producing coherent results that correlate strongly with various income and poverty measures. CAMPE-Bangladesh utilised the principal components approach in generating the wealth index for its Education Watch study on education financing. (See Box 1).

Box 1. Excerpt from the Study on Financing Primary and Secondary Education in Bangladesh Campaign for Popular Education (CAMPE): Education Watch 2006

Wealth index

The socio-economic status of each individual household in the sample has been measured by wealth index. The wealth index of each household has been estimated by using principal components approach (Filmer and Pritchett, 1998; Filmer and Pritchett, 1999; Filmer, 2000; and Filmer and Pritchett, 2001). Wealth index represents the level of wealth that is consistent with income, expenditure, and household assets (Rutstein, 1999). The index has been worked out for each household using data on family characteristics and consumer durables owned by households (table, chair, cot, quilt, mattress, blanket, wristwatch, wall/table clock, radio, television, bicycle, motor cycle, electric fan, freezer) collected through the household survey conducted.

Methodology: wealth index computation

Information on each consumer durable is recorded in dichotomous form (Yes=1, No=0). Principal components analysis has been used to determine the weight of household assets. Each asset is assigned a weight (factor score) generated through the analysis. The resulting asset scores are standardised in relation to normal distribution with a mean of zero and standard deviation of one (Gwatkin et. al., 2000). Scores for the assets are summed up to obtain the total score (wealth index) for each household.

Households are ranked according to the total score (wealth index) of the household in ascending order. Ranking of households are established for rural and urban areas separately for primary and secondary education. All the households for rural and urban sub-populations have been divided into five equal groups based on the household wealth index. These groups are: poorest, poor, middle, rich, and richest. The four subpopulations are: rural primary, rural secondary, urban primary and urban secondary students.

SAMPLE WEALTH INDEX INSTRUMENT

The Annexures include extracts from the EdWatch survey instruments which contain specific questions on asset ownership and amenities. The data collected from these questions were used to generate the wealth index for each household covered by the surveys.

Annex 1: E-Net Philippines - Questions on Asset Ownership and Household Amenities

Annex 2: E-NET for Justice, Indonesia - Questions on Asset Ownership and Amenities

Annex 3: CAMPE Bangladesh – Questions on Family Characteristics and Asset Ownership

Also included in the Annexures are examples of core indicators for computing the wealth index used by UNICEF as part of its Multi-Indicator Cluster Survey (Annex 4). A listing of assets and amenities used in the India study is presented in Annex 5.

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Annexures

ANNEX 1: E-NET PHILIPPINES - QUESTIONS ON ASSET OWNERSHIP AND HOUSEHOLD AMENITIES¹

EXTRACT FROM THE SURVEY QUESTIONNAIRE²

<p>What is your household's (HH) main source of drinking water?</p> <ol style="list-style-type: none"> 1. Community water system – own use 2. Community water system – shared with other HH 3. Artesian well deep – own use 4. Artesian well deep – shared with other HH 5. Artesian well shallow – own use 6. Artesian well shallow – shared with other HH 7. Dug well – own use 8. Dug well – shared with other households 9. River, stream, lake, spring and other bodies of water 10. Bottled water (mineral, purified, distilled) 11. Other sources (specify) _____ 	<input type="checkbox"/>	<p>Does your household or any member of your household have:</p>	<p>1. YES 2. NO</p>
<p>How far is the source of drinking water from your house?</p> <ol style="list-style-type: none"> 1. Within the premises 2. Outside premises but 250 meters or less 3. 251 meters or more 4. Don't know 	<input type="checkbox"/>	<p>1. Electricity?</p>	
<p>What kind of toilet facility does the household use?</p> <ol style="list-style-type: none"> 1. Water sealed flush to sewerage 2. Water sealed flush to sewerage system/septic tank – shared with other households 3. Closed pit 4. Open pit 5. No toilet 6. Others, specify _____ 	<input type="checkbox"/>	<p>2. Radio/radio cassette?</p>	
<p>Does your household or any member of your household own agricultural lot/s?</p> <p>1. YES (GO TO 53) 2. NO (GO TO 54)</p>	<input type="checkbox"/>	<p>3. Television?</p>	
<p>IF YES IN (52), What is the estimated total land area in hectares?</p>	<input type="checkbox"/>	<p>4. Landline telephone?</p>	
<p>What is the tenure status of the housing unit and lot occupied by your household?</p> <ol style="list-style-type: none"> 1. Owner, owner-like possession of house and lot 2. Rent house/room including lot 3. Own house/rent lot 4. Own house, rent-free lot with consent of owner 5. Own house, rent-free lot w/o consent of owner 6. Rent-free house and lot with consent of owner 7. Rent-free house and lot without consent of owner 8. Other tenure status (specify) _____ 	<input type="checkbox"/>	<p>5. Cellular phone?</p>	
		<p>6. Washing machine?</p>	
		<p>7. Refrigerator/freezer?</p>	
		<p>8. CD/VCD/DVD players?</p>	
		<p>9. Component/karaoke?</p>	
		<p>10. Personal computer?</p>	
		<p>Does your household or any member of your household own:</p>	<p>1. YES 2. NO</p>
		<p>1. Tractor?</p>	
		<p>2. Motorized banca/boat?</p>	
		<p>3. Car/jeep/van?</p>	
		<p>4. Motorcycle/tricycle?</p>	
		<p>5. Bicycle/pedicab?</p>	
		<p>For the Enumerator: Answer based on your observation of the construction materials used in the said part of the housing structure</p>	
		<p>Construction materials used in the walls of the house (SEE CODES FOR TYPE OF MATERIAL)</p>	
		<p>Construction materials used on the roof of the house (SEE CODES FOR TYPE OF MATERIAL)</p>	
		<p>CODES FOR TYPE OF MATERIAL</p>	
		<p>1. Strong materials (concrete, brick, stone, wood, galvanized iron, asbestos)</p>	
		<p>2. Light materials (bamboo, sawali, cogon, nipa)</p>	
		<p>3. Salvaged/makeshift materials)</p>	
		<p>4. Mixed but predominantly strong materials</p>	
		<p>5. Mixed but predominantly light materials</p>	
		<p>6. Mixed but predominantly salvaged materials</p>	

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²The complete set of survey questionnaires used in the EdWatch studies is available upon request from ASPBAE.

ANNEX 2: E-NET FOR JUSTICE, INDONESIA - QUESTIONS ON ASSET OWNERSHIP AND AMENITIES

EXTRACT FROM THE SURVEY QUESTIONNAIRE

<p>9. What is the kind of housing material used by the household for this dwelling unit?</p> <ol style="list-style-type: none"> 1. Permanent (See guide) 2. Semi Permanent 3. Hut 	<input type="checkbox"/>
<p>10. What is the ownership status of this housing/dwelling unit?</p> <ol style="list-style-type: none"> 1. Own property 2. Long term contract 3. Monthly rent 4. Household property 5. Others 	<input type="checkbox"/>
<p>11. What is the source of clean/drinking water for this household?</p> <ol style="list-style-type: none"> 1. From well (Bail) 2. From well (hand pump) 3. From well (electric pump) 4. From river/water source Sumatra 5. From public faucet (PDAM) 6. Buy 7. From local company distributing drinking water through faucet at residence 8. Others, provide detail _____ 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<p>12. Who among the household members usually fetches water for this household?</p> <ol style="list-style-type: none"> 1. Husband 2. Wife 3. Son 4. Daughter 5. Others, provide detail _____ 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<p>13. Do household members have access to a toilet facility?</p> <ol style="list-style-type: none"> 1. Yes, in own home 2. Yes, we use public toilet 3. Yes, shared/cooperative ownership 4. No/None 	<input type="checkbox"/>
<p>14. Does your household have electricity?</p> <ol style="list-style-type: none"> 1. Yes 2. No 	<input type="checkbox"/>

15. Provide details of the assets/high value goods owned by your household

Assets/High value goods	Number
Land for house	
House	
TV	
Radio	
VCD player	
Mobile telephone	
Gold or jewelry	
Antique goods (keris, furniture, other)	
Car	
Motorcycle	
Tricycle	
Boat/Sampan	
Outboard motor	
Rice field/garden/farm	
Tractor	
Net/Seine/Trawl	
Cow/buffalo	
Goat	
Home theatre	
Computer	
Others	

ANNEX3: CAMPE, BANGLADESH – QUESTIONS ON FAMILY CHARACTERISTICS AND ASSET OWNERSHIP

EXTRACT FROM THE SURVEY QUESTIONNAIRE

Name of the Student (Selected through process): _____	
Class: _____	Sex: Male (1)/Female (2) _____
Religion: Muslim (1)/Hindu (2)/Budhdha (3)/Christian (4) _____	
Ethnicity: Bengali (1) / Ethnic Minority (2) _____	
Name of the parent/guardian: _____	Sex: Male (1) /Female (2) _____
Occupation: _____	Average Income of the household: Tk. _____
Total Member of the household: Male: _____ Female: _____ Total: _____	

Asset Ownership

Assets	
Agriculture Land	
House and Other Land	
Total	
Other household assets (please mention the numbers):	
(a) Table/Chair	
(b) Cot/couch	
(c) Blanket/quilt	
(d) Wrist Watch/Wall clock/Table clock	
(e) Radio/Television	
(f) Bicycle	
(g) Ceiling Fan/Freezer	
(h) Motorcycle	

ANNEX 4: CORE INDICATORS FOR CALCULATING HOUSEHOLD WEALTH INDEX

MULTI-INDICATOR CLUSTER SURVEY (MICS), UNICEF

Question group

Main material of dwelling floor

Number of rooms in dwelling

Main source of drinking water

Toilet facility

Household Assets/Amenities: electricity, radio, television, refrigerator

Member of household ownership: bicycle, motorcycle, car

Main cooking fuel used by household

ANNEX 5: LISTING OF ASSETS AND AMENITIES

World Bank Policy Research Working Paper on estimating household wealth and effects on enrollment, India (Filmer and Pritchett, 1998).

1. Clock/watch
2. Bicycle
3. Radio
4. Television
5. Sewing machine
6. Motorcycle/scooter
7. Refrigerator
8. Car
9. Drinking water from pump/well
10. Drinking water from open source
11. Drinking water from other sources (non-piped)
12. Flush toilet
13. Pit toilet/latrine
14. None/othertoilet
15. Main source of electric lighting
16. Number of rooms in dwelling
17. Kitchen is a separate room
18. Main cooking fuel is wood/dung/coal
19. Dwelling all high quality materials
20. Dwelling all low quality materials
21. Own at least 6 acres land



**Asia South Pacific Association
for Basic and Adult Education**

Learning Beyond Boundaries

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