


Water Poverty Index



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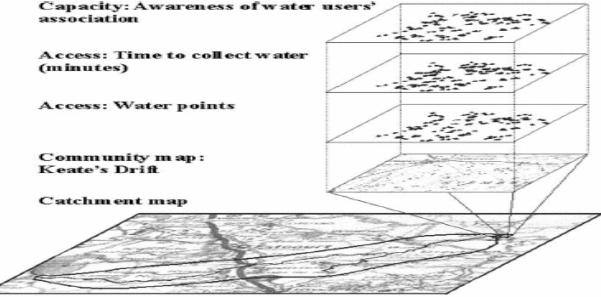
Concept of WPI

- 1. Resource** - Physical availability of surface and ground water
- 2. Access** - The extent of access to this water for human use
- 3. Capacity** - The effectiveness of people's ability to manage water
- 4. Use** - The ways in which water is used for different purposes
- 5. Environment** - The need to allocate water for ecological services

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Concept of WPI

- Capacity: Awareness of water users' association
- Access: Time to collect water (minutes)
- Access: Water points
- Community map: Keate's Drift
- Catchment map




Using GIS to integrate data for assessment of the WPI (not actual data)

Will people use the WPI?

Yes, if they want to answer these sorts of question ...


- How can progress towards targets be monitored?
- Who needs water most?
- How should water expenditure be prioritised?

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- What will happen with increased water demand?
- How will we prioritise water rationing during droughts?


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Key uses of the WPI

- The WPI provides decision-makers with a transparent framework on which to base their decisions. It can be used in a number of ways, such as:
 - A tool for prioritisation according to a standardised method
 - A way of understanding more about the complexities of water management


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A tool for monitoring progress over time (assuming the tool is implemented and updated at reasonable periods such as 3 to 5 years),

- A tool to empower communities and decision-makers by giving them confidence in the rationale behind water management decisions, and
- An evaluation tool to be applied at a variety of scales, including the national scale and at the community level, enabling more informed decisions to be made.

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$$WPI = 1/3(Wa * A + Ws * S + Wt(100 - T))$$

A: Water Availability (%)
 S: the population with access to safe water and sanitation (%).
 T : Time index (e.g., between 0 and 100)
 (100 - T) is the structure used to indicate the time taken as an index
 wa, ws and wt are the weights given to each component of the index (so that wa + ws + wt = 1).

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WPI- Calculation

Table 3. WPI calculated using the composite index approach*

	Water availability (%)	Access to water (%)	Index of time spent in water collection	WPI
Weights	0.5	0.25	0.25	
Region A	60	20	30	17.5
Region B	60	12	40	16

*In this method, the higher the value of WPI, the lower the degree of water stress; so Region B has a greater degree of water poverty than A.

$$WPI = 1/3(W_a * A + W_s * S + W_t(100 - T))$$

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A numerical example: To illustrate, consider two different regions or countries:

Region A: The values A , S and T are 60, 20 and 30, and the weights w_a , w_s and w_t are 0.5, 0.25 and 0.25 respectively. Referring to Eq. (2), $WPI = \frac{1}{3}(w_a A + w_s S + w_t(100 - T))$, so

$$WPI_A = 1/3[(60 \times 0.5) + (20 \times 0.25) + 0.25(100 - 30)] = 17.5 \text{ (index points)} \quad (3)$$

Region B: The values A , S and T are 60, 12 and 40, and the weights w_a , w_s and w_t are 0.5, 0.25 and 0.25 respectively. Referring to Eq. (2), $WPI = \frac{1}{3}(w_a A + w_s S + w_t(100 - T))$, so

$$WPI_B = 1/3[(60 \times 0.5) + (12 \times 0.25) + 0.25(100 - 40)] = 16 \text{ (index points)} \quad (4)$$

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WPI -comparison

WATER POVERTY INDEX

Capacity and Use

High

* Saudi Arabia * Singapore * USA

* South Africa * Thailand * Netherlands

Availability and Access

Low

* Yemen * Colombia High

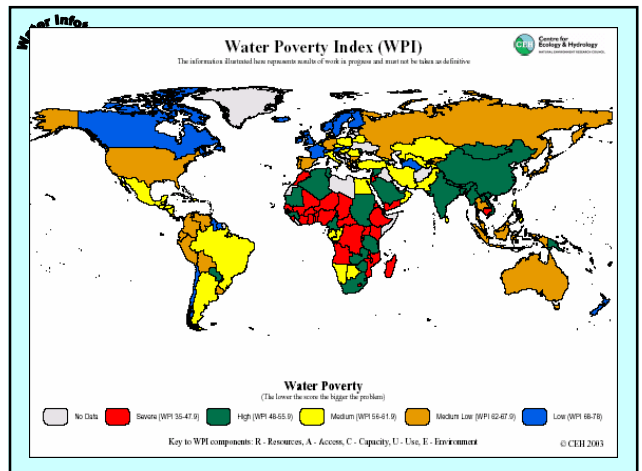
* Namibia * Indonesia * Guyana

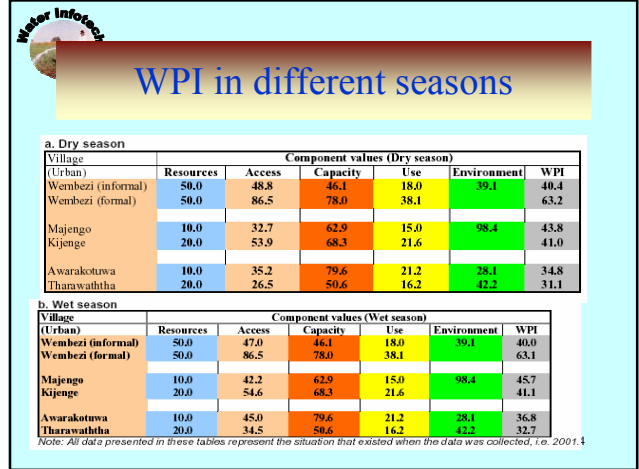
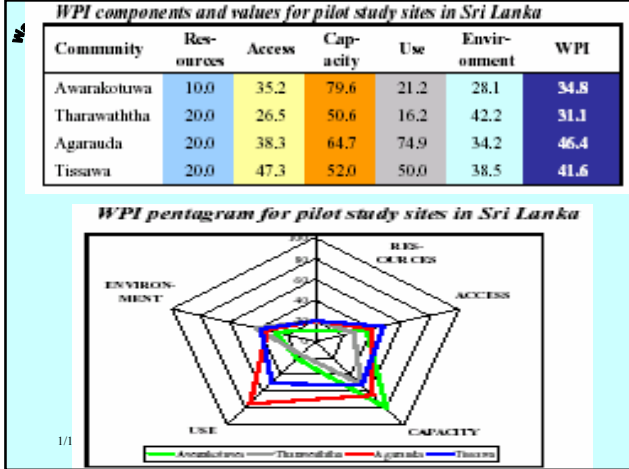
* Morocco * Nigeria

* Bolivia

LOW

Figure 2. Using a matrix approach to express the WPI. Source: Sullivan (2001a).

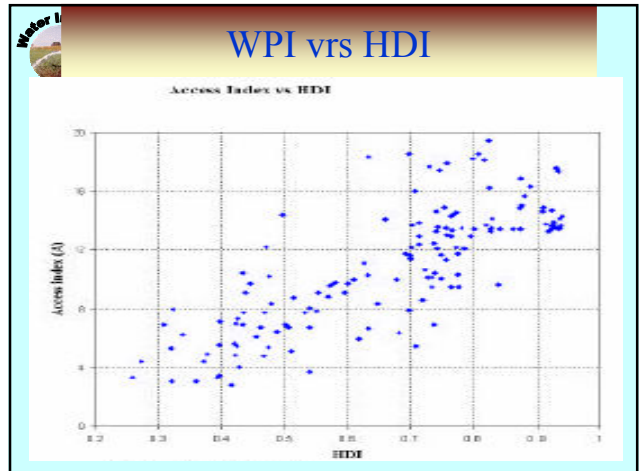




WPI

	Resources	Access	Capacity	Use	Environment	WPI	HDI
El Salvador	7.6	15.6	12.6	9.1	11.0	55.9	0.701
Equatorial Guinea	14.8	14.9	12.7	14.3	10.9	67.7	0.610
Eritrea	6.2	2.8	9.8	7.6	10.9	37.4	0.416
Ethiopia	6.6	3.1	8.0	8.1	9.5	35.4	0.321
Fiji	13.4	16.9	16.5	7.4	7.7	61.9	0.757
Finland	12.2	20.0	18.0	10.6	17.1	78.0	0.925
France	7.9	20.0	18.0	8.0	14.1	68.0	0.924
Gabon	16.5	8.8	13.2	12.2	10.8	61.5	0.617
Gambia	8.6	10.6	10.9	7.3	10.9	48.3	0.398
Georgia	11.0	17.5	13.1	7.6	10.9	60.0	0.742
Germany	6.5	20.0	18.0	6.2	13.7	64.5	0.921
Ghana	6.9	8.1	12.7	7.2	10.4	45.3	0.542
Greece	9.3	20.0	17.4	8.9	10.0	65.6	0.881
Guatemala	10.9	16.0	13.8	6.6	12.0	59.3	0.626
Guinea	13.1	7.7	9.0	11.0	10.9	51.7	0.387
Guinea-Bissau	11.8	8.9	6.1	10.3	10.9	48.1	0.339
Guyana	18.1	17.9	14.0	14.9	10.9	75.8	0.704
Haiti	6.1	6.2	10.5	6.5	5.8	35.1	0.467
Honduras	11.4	15.0	14.2	9.2	10.5	60.2	0.634
Hungary	9.5	13.5	16.9	8.9	12.6	61.4	0.829
Iceland	19.9	20.0	19.2	6.7	11.2	77.1	0.932
India	6.8	11.0	12.1	13.8	9.5	53.2	0.571
Indonesia	11.2	13.4	13.9	15.7	10.7	64.9	0.677
Iran	6.8	14.8	15.5	13.5	9.8	60.3	0.714
Ireland	11.2	19.8	19.1	10.5	12.8	73.4	0.916
Israel	0.8	16.7	16.8	10.9	8.6	53.9	0.893
Italy	7.7	19.8	17.4	5.3	10.7	60.9	0.909
Jamaica	8.2	17.5	15.0	7.5	9.5	57.7	0.738
Japan	8.1	20.0	18.9	6.2	11.6	64.8	0.928

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Rank of India out of 147 countries

Israel	53.90	late 1990s, early 2000s	93
Armenia	53.80	late 1990s, early 2000s	94
Cameroon	53.60	late 1990s, early 2000s	95
Kuwait	53.50	late 1990s, early 2000s	96
Laos	53.50	late 1990s, early 2000s	97
Zimbabwe	53.40	late 1990s, early 2000s	98
Swaziland	53.30	late 1990s, early 2000s	99
India	53.20	late 1990s, early 2000s	100