Towards a Gender and Water Index

Barbara van Koppen
International Water Management Institute

1. Gender in the Water Poverty Index

The Water Poverty Index seeks to link two major global challenges that, for too long, were addressed separately. One is the effective and ecologically sustainable management of freshwater resources, which become increasingly scarce as the demands by growing and increasingly wealthier populations augment. The other challenge regards the social uplift of the world's poor, who are still left out, living below minimum standards of wellbeing, especially in rural areas in the South. Water is an important asset in this process.

Gender issues are integrated in the Water Poverty Index in various explicit and implicit ways. Explicitly, gender-disaggregated data were collected in a study into domestic water provision to households without a house connection in South Africa (453 households), Tanzania (377 households), and Sri Lanka (411 households). The results are presented in this paper. Gender issues are also implicitly addressed by examining health and sanitation issues related to domestic water supplies among the poor (*cf* Hunt and Cairncross 2001; Sullivan 2002). Inadequate facilities are widely known to affect poor women even stronger than men. Women are not only primarily responsible for water supply but, as caretakers for children and the sick, women often bear a disproportionate burden of water-related disease. Moreover, better sanitation especially benefits women, who are more disadvantaged in this regard than men (Hannah and Anderson 2001). A better understanding of these and other relationships is of utmost relevance for poor women, who outnumber poor men (UNDP 1995).

The present paper further expands on the gender dimensions of the Water Poverty Index. One area to further add value regards gender issues in productive uses of water, especially irrigation, and in water resources management, such as catchment management. Below, some latest research findings are reported. Another addition is conceptual and methodological. This paper explores a methodology for the development of a specific Gender and Water Index for integrated water resources management. 'Gender' is taken as the very starting point, recognizing that gender and poverty are inter-related but yet *different* social phenomena. Developing a Gender and Water index is analogous to what the Water and Poverty Index developed for poverty.

Gender refers to the social and psychological dimensions of the relationships between men and women, articulating how these relationships are shaped by society and its history, norms, culture, institutions, education and socialisation, economy, laws, and politics. Biological differences between men and women as the two 'sexes' are obvious reality. However, the notion of 'gender' conveys the wide variation throughout history and across the world in which different societies attribute economic, cultural, and socio-political meanings to what is often people's strong identity of 'femininity' or 'masculinity'. Gender clarifies that 'sexe' is no natural destiny but human creation, subject to agency and change (Jackson 1998). Although

gender, poverty, and water are intertwined –just like gender and other sets of social relationships are- this paper explores the route of analytical distinction, at least initially, before blending again into hopefully richer insights.

2. Rationale and Method for Gender and Water Index Development

The Gender and Water Index developed below is a decision-support tool that guides policy makers in ensuring greater gender equity in the basins governed, as relevant for integrated water resources management – the focus of our attention here. A Gender and Water Index allows characterizing and comparing basins from a gender perspective and monitoring the same basin over-time, for example to assess impacts of new policies. The policy relevance is the greater, if the indices relate more directly to integrated water resources management and give better direction for feasible and effective intervention to the policy makers, legislators, and implementers from governmental and non-governmental national and international organizations, for which the indices are meant to be a decision-support tool. Indices that aim to capture complex phenomena, as gender relations and other social phenomena typically are, comprise many components or 'attributes'. Attributes can be expressed as indicators and, then, indicators can be aggregated again into indices. Perhaps the clearest way to accommodate a lay audience about the meaning of indicators and indices is to express the indicator, and, after aggregating and weighting, the indices, as scores between 1 and 5. The value of the score would express the degree to which the socio-political goal of the users of the tool is achieved, or not, at a certain moment in time.

For gender relations, conform the Convention of Elimination of All Forms of Discrimination against Women (United Nations 1987) and the Platform for Action, formulated during the Fourth World Conference on Women in Beijing (United Nations 1995), one could come, for example, to the following agreement about the "gender performance of a basin". A basin would perform well from a gender perspective, if:

- both genders have equal access to water and benefit equally,
- both genders bear equal costs for using water,
- both genders participate equally in (paid and unpaid) water management and decision-making.

Such basins would receive a score of 5. The score of basins in which women are virtually completely excluded from benefits from water and decision-making, but still bear high costs, would be 1.

Although a score 5 for any river basin may seem utopian at this time in history, this does not challenge the rationale and method for the development of a Gender and Water Index as such. However, there is an important issue here: water management is only one aspect of the many factors that shape, change, or perpetuate the socio-economic, historical, cultural, and political relations between men and women. Gender equity requires more changes in society than only those depending upon ways of governing water. Nevertheless, the rationale and method for index development as such remain valid if one wants to compare river basins from a gender perspective. However, it warrants a better understanding of the multiple relationships between gender and water. Moreover, action only within a narrow water sector is insufficient to reach a higher gender score. We come back to this.

The modest aim of the present paper is to explore just the very first step of a Gender and Water Index, which is the identification of key attributes to be included in such Index. The attributes are a synthesis of key issues highlighted in global literature and debates on gender and water during the past decades. Each key attributes is researchable either in the conventional way or with a more participatory method. While some data may already be available, the collection of other data may require more or less effort. As for other basin characteristics, data tend to be available at other levels than basins. Regrouping of results according to river basin boundaries is still needed. While the methodological feasibility of measuring the attributes and hence their appropriateness for verifiable indices development need to be kept in mind, the single most important first step is consensus on the attributes. This is the basis for second steps, such as the conceptual development and empirical measurement of indicators of each attribute and their aggregation into one index.

We now come back to the nature of the relationships between gender relations and the natural resource of water. These relationships are more or less evident and strong. In this paper we highlight the more or less proven relationships. Attributes for which the relation with water use and management is clear and direct are called 'Direct Gender and Water Attributes'. Attributes that highlight underlying processes that indirectly, but often forcefully, impinge upon gender dynamics in water use and management are so-called 'Integrated Gender and Water Attributes'. The 'Integrated Gender and Water Attributes' have been identified in research, although hardly any quantification on the relationships has been undertaken as yet. Integrated attributes constitute important conditions or 'prior issues' that influence the more visible, direct relationships. Without addressing those prior issues, water policy makers risk just scratching a surface, without ever reaching even a score 2, or 3, let alone score 5, if we take the above-mentioned example in which score 5 expresses equal access to water, equal benefits and costs, and equal participation in paid and unpaid water management decision-making.

The less visible but yet important attributes are called 'Integrated Attributes', conforming the global recognition that a more comprehensive approach to water management, or Integrated Water Resources Management, is needed (Global Water Partnership 2000). However, up till now, Integrated Water Resources Management (IWRM) was interpreted in a limited way and confined to the physical and hydrological aspects of water management (quantity-quality; surface-groundwater; upstream-downstream; basin-boundaries). As we will show, it is both needed and fruitful to elaborate the concept of IWRM to also address complex relationships between the natural resource water and social relations, such as societies' gender relations and other socio-economic, class, caste, and ethnic relations. Underlying social processes can be better understood if the call for *Integrated* Water Resources Management is better applied to the social dimensions as well.

Basically, a more integrated approach is a matter of common sense. Even daily discussions on gender and water, especially water for productive purposes, quickly reach the point in which gender characteristics *not* obviously related to water seem more important, such as women's limited education or women's limited access to land. Education, land, and other factors emerge spontaneously as *prior* social conditions, or ultimate desired impacts, of effective Integrated Water Resources Management.

A review of literature, including ongoing debates in the global Gender and Water Alliance (Maharaj 2002), resulted in the following list of gender issues that have been identified as relevant, either as Direct or Integrated Gender and Water Attributes. They should, in any case, be included in a Gender and Water Index that assesses the performance of river basins from a gender perspective. All attributes are policy-relevant and can be measured empirically. The development of the method for the latter and its implementation can be taken forward once there is consensus about the list of relevant attributes.

Table 1. Overview of Direct and Integrated Attributes of a Gender and Water Index

DIRECT AND INTEGRATED ATTRIBUTES OF A GENDER AND WATER INDEX	
1. Minimum and Shared Intra-Household Costs for Domestic Water	
Attribute 1- Direct	Minimum Costs for Safe Domestic Water
Attribute 2- Direct	Shared Costs for Safe Domestic Water
Attribute 3 - Direct	Women's Equal Participation in Community Decision-making
2. Equal (Self-) Employment and Other Benefits from Water for Productive Uses	
Attribute 4 – Direct	Women Farmers' Equal Access to Water for Productive Use
Attribute 5 – Direct	Women Farmers' Equal Participation in Water User Associations
Attribute 6 - Integrated	Equal Access to and Control over Water-dependent Enterprises
Attribute 7- Integrated	Sharing in Water-related Employment and other Benefits
3. Equal Participation in (Unpaid and Paid) Water-related Decision-making	
Attribute 8 - Direct	Women's Equal Participation in Water-related Decision-making
Attribute 9 – Direct/Integ.	Gender-disaggregated Data
Attribute 10 - Integrated	Women's Equal Education and Inclusion in Public Governance

3. Minimizing and Sharing the Intra-Household Costs for Domestic Water

In poor households in which household water connections are still lacking, the task to provide water for household use is often gendered in the sense that men and women have different obligations to contribute to this aspect of family welfare (Van Wijk 2001). Water provision is one of the tasks integrated in the broader societal gender patterns in which unpaid domestic and income-generating tasks are divided. For example, men may be responsible for the digging and upkeep of public village tanks or wells, thus controlling the access to the resource, while women take up most of the

laborious task of daily water fetching for their households. Elsewhere, for example in cultures where women's seclusion is strong, male kin may also take up these latter responsibilities, especially when it involves more sophisticated means of transport, like bicycles.

In the context of the Water Poverty Index, detailed comparative empirical research was carried out into prevailing divisions of household water provision tasks in villages in South Africa, Tanzania, and Sri Lanka, the results of which are summarized in Table 1, Table 2, and Table 3. Salient findings are the following.

In all villages in all three countries, women are the water carriers in the large majority of households, varying from 83% to 91%. Men and children are clearly less regular contributors, but the patterns vary considerably. In Tanzania, in 16% of the households only are men also providing water. In South Africa, this is 20%. In Sri Lanka, however, this varies substantively in the four villages studied. In Awarakotuwa, as many as 64% of the households have men who carry water, while this is only 17% in Tharawatta – similar to the African villages.

For children, the pattern is the reverse: African children contribute more often than their fathers to water provision, 37 and 42 % in Tanzania and South Africa respectively. However, in Sri Lanka, children contribute in less than 15% of the households. (In interpreting these data, one should note that the proportion of children of the defined age also differs). These patterns are also reflected in the averages for all households in the respective villages in terms of, first, number of household members by gender and age that regularly carry water and, second, in terms of the number of trips that the respective household members make, on average, and, third, in terms of volume of water contributed.

What is interesting in the African surveys in which this question was particularly asked, is that, if men carry water, they bring larger volumes of water than their female kin per trip. Children, on the other hand, bring less than both adult men and women.

Overall, the labor costs to provide water are huge, especially for women and in the dry season. In South Africa, women spend up to 119 minutes per day for this chore; in Tanzania, it is even as high as 416 minutes in the dry season. In Sri Lanka, the time inputs even for a normal day are high, varying from 97 to 221 minutes. Yet, the volumes of water available per person per day in all sample villages are still below or even way below the quantities recommended by the WHO of 50 liters per person per day. For South Africa the volume is even as low as 18 liters.

Table 1. Water provision by gender in South Africa (Ethembeni, Latha, and Wembezi) for households without connection*

Sample demographics

number of households	453
number of persons in sample	4346
percentage adults	61
percentage children	39

Water provision

wet season; time per trip (min)	35
dry season: time per trip (min)	35
households with women water carriers (no., %)	413 (91%)
households with men water carriers (no., %)	90 (20%)
households with children water carriers (no., %)	167 (37%)

	women	**men**	**children**
average volume per trip (ltrs)	22	32	14
average number of persons per trip per day			
first trip	1.6	0.3	0.6
second trip	1.2	0.2	0.3
third trip	0.7	0.1	0.2
average number of trips per person per day	3.4	0.5	1.1
wet season average time per person per day (min)	118	19	37
dry season average time per person per day (min)	119	19	37
average volume provided per person per day (ltrs)	84	14	16

	average household
total volume available per household per day (litrs)	115
total volume available per person per day (ltrs)	18

* 159 households have a household water connection, mainly in Wembezi

Table 2. Water provision by gender in Tanzania (Nkoaranga, Samaria, Majengo, Kijenge) for households without connection*

Sample demographics

number of households	377
number of persons in sample	2592
percentage adults	52
percentage children	48

Water provision

wet season; time per trip (min)	142
dry season: time per trip (min)	164
households with women water carriers (no., %)	312 (83%)
households with men water carriers (no., %)	59 (16%)
households with children water carriers (no., %)	158 (42%)

	women	**men**	**children**
average volume per trip (ltrs)	45	66	39
average number of persons per trip per day			
first trip	1.1	0.2	0.4
second trip	0.8	0.1	0.2
third trip	0.6	0.1	0.4
average number of trips per person per day	2.5	0.3	0.9
wet season average time per person per day (min)	360	45	135
dry season average time per person per day (min)	416	52	156
average volume per person per day (ltrs)	85	14	28

	average household
average volume available per household per day (ltrs)	127
average volume available per person per day (ltrs)+A18	28

*104 households have a household water connection

Table 3. Water provision by gender in Sri Lanka (Agarauda, Awarakotuwa, Tharawatta, Tissawa) in 411 households without connection

Sample demographics	*Village*			
	Agarauda	Awara-kotuwa	Thara-watta	Tissawa
number of households	65	120	83	143
number of persons	282	500	346	579
percentage of male adults	36	34	37	40
percentage of female adults	35	36	34	40
percentage of male children <14	13	14	13	11
percentage of female children <14	16	16	16	9
Water provision				
wet season; time per trip (min)	15	23	47	13
dry season: time per trip (min)	18	71	92	24
households with women water carriers (no., %)	57 (88%)	107(89%)	74 (89%)	120(84%)
households with men water carriers (no., %)	29 (45%)	77 (64%)	14 (17%)	79 (55%)
households with children water carriers (no., %)	10 (15%)	8 (7%)	6 (7%)	20 (14%)
average number of household members regularly providing water				
women	1	0.9	1.1	1
men	0.5	0.6	0.2	0.6
children	0.1	0.1	0.1	0.1
average volume per trip (ltrs)	25	24	26	25
average number of trips per normal day	7.3	6.4	4.7	7.5
average volume available per household per day (ltrs)	185	153	121	186
average volume available per person per day (ltrs)	43	37	29	46
total time per household per normal day (min)	105	147	221	97

The empirical findings of this research underline the need to include the following attributes in a Gender and Water Index.

Attribute 1- Direct: Minimum Costs for Safe Domestic Water
Consensus is broad that the extent to which especially poor women but also poor men are *liberated* from the former labor or excessive cash burdens, is a major manifestation of 'good gender performance' in a river basin. Obviously, better water supply is especially important for the poor whose access to facilities is weakest. Moreover, for them, cash costs, both absolutely and relatively as a proportion of the income, are often exorbitantly high. New facilities should be affordable for them. The latter goal incited, for example, the government of South Africa to provide the first 6000 liters per household per month for free, through cross-subsidization by higher-volume users who pay higher tariffs, and through state support. Domestic water supply projects by national and international governments and NGOs can significantly change and improve women's and men's wellbeing and gender relations.

Attribute 2- Direct: Shared Costs for Safe Domestic Water
Gender equity in the division of the remaining cash and labor obligations within households is another direct gender attribute, embedded in the social patterns in which men and women divide their contributions to household welfare. Empirical insight in

this issue is still limited. An anecdotic example in Niger tells that women continued taking the lion share of the new obligations after installation of a borehole, even when this required cash investments. In other situations where taps were newly installed, as in Mashabela, South Africa, the relative easiness of the new water points stimulated men to also fetch water, unlike before. However, most men did not change their overall contributions to the household expenditures in order to pay these new costs (Van Koppen and Makola forthcoming). Where house connections are full-fledged, gendered labor input for water provision has become irrelevant. The issue of the way in which men and women contribute to the cash costs is again a matter of intra-household patterns of obligations for expenditures for household welfare.

Attribute 3 - Direct: Women's Equal Participation in Community-level Decision-making

A third gender attribute in domestic water supply is community-level decision-making and the access to possibly new paid employment opportunities. Community decision-making in projects includes the site selection, technology choice, training and capacity building, membership rights and obligations, composition of the committee including the leadership positions, paid positions of operators and mechanics, etc. This attribute, in which agencies themselves play the major role, has been well studied. There is strong evidence in the water sector that women's inclusion in community-level decision-making on domestic water supply on the same footing as men's considerably enhances the efficiency and chances for sustainable adoption of the new facilities (*cf* Van Wijk-Sijbesma 2001; UNDP/SEED 2000).

4. Ensuring Equal (Self-) Employment and Other Benefits from Water for Productive Uses

Water is a also crucial input into income-generating activities, especially in rural areas. Self-employment for incomes in kind and cash in rural households in the form of gardening, cropping, livestock, fisheries, forestry, small industries, etc. critically depend upon water and, hence, the technologies to better manage water, mitigate periods of drought and protect against adversities like soil erosion, flooding, and increasingly pollution. As direct water users in such self-employment, both men and women require, in the first place, access to appropriate land and water management technologies to improve their access to water for the divers water-related enterprises. Second, once the physically available water resources are being committed and competition for the scarce resources increases, water allocations to female water users need to be as well protected, if not expanded, as water allocations to male water users.

Attribute 4 - Direct: Women Farmers' Equal Access to Water for Productive Purposes

Attribute 5 – Direct: Women Farmers' Equal Participation in Water User Associations

Direct Gender Attributes have been extensively documented for the case of irrigation. They follow from the need of women farm decision-makers to obtain access to water, on the same footing as men farm decision-makers, to improve the producitivy of their water-dependent enterprises. Worldwide, numerous cases have been documented in which women farm decision-makers were bluntly excluded in the construction of new irrigation schemes (Hangar and Morris 1973; Dey 1980; Zwarteveen 1994; Van Koppen 1998; Merrey and Baviskar 1998). Women farmers who, before the project,

had strong local rights to land in the new command area or women who were well included in local arrangements to obtain water rights through participation in construction works (Prins 1996), were simply expropriated, often from one day to the other, because of projects that were heavily biased in favor of men. This had negative impacts on the production in the new schemes, as women withdrew labor or even completely abandoned these sites by lack of own benefits (Jones 1986; Carney 1988).

These project failures raised awareness and sensitivity among irrigation professionals. Various more recent irrigation projects pioneered into including both men and women farm decision-makers from the design phase of the project onwards. They consequently achieved better productivity and equity. These projects proved to be more successful, in terms of canal maintenance, cost-recovery, and dynamism of Water Users Associations and their committees (Hulsebosch and Ombarra 1995; Arroyo and Boelens 1997; Van Koppen et al. 2001). So both for the purpose of gender equity and sustainable productivity, women farm decision-makers should be equipped with the same technical means to access water and be equally included in Water Users Associations as men, both as members and leaders.

In the above, we focused on the access to irrigation technologies and institutions for women *farm decision-makers*. Depending upon the local situation, which highly varies over the globe, a considerable proportion of farm decision-makers can be women. This is the case, for example, in areas with high male out-migration like in parts of Eastern and Southern Africa (Safiliou 1994; Van Koppen et al. 2000), but also in Latin America and Asia; or for specific agro-ecological environments like wetlands in West Africa (Richards 1986); or for homestead cultivation worldwide. Such farming systems with about equal or even more than, say, a two-third majority of women are called respectively 'dual' and 'female farming systems' (Safiliou 1988; Van Koppen 2002). The gender attributes discussed concern especially female or dual farming systems.

Male farming systems are defined as farming systems in which the majority of farm decision-makers, say more than two-third, are male. Male farming systems are found in areas in countries like India and Nepal, although, often unexpectedly, there may also be exceptions (Zwarteveen 1996). In areas with such male-dominated agrarian structure, women in most farm households are merely unpaid farm laborers, whose contributions are confined to the laborious, unskilled tasks. Irrigation is rarely a task for which women are primarily responsible. Core tasks like irrigation, which highly influence the success of the enterprise and often require specific skills, monetary investments, and contacts with outsiders, are monopolized by men as a gender. When the income status allows, female kin is replaced by male or female wage laborers.

The minority of women farm decision-makers in such male farming systems not only faces prejudices from the intervening agencies, as the case mentioned above, but also from gender-biased local arrangements. As a corollary, agencies seeking more gender-inclusiveness for this minority of women farm decision-makers have to challenge local norms and practices. Agencies are bound to counter male resistance in male farming systems, while in the dual and female farming systems mentioned above, agencies' just have to go with the rather equitable local gender relations, rather than introducing new gender exclusion (Van Koppen 2002).

Attribute 6 - Integrated: Women's Equal Access to and Control over Water-dependent Enterprises

In male farming systems, the majority of women face primarily the 'prior' gender issue that they lack control over own economic enterprises and their outputs. The fact that water is one input in comprehensive production systems makes water a special resource. Once women (or any other social category) are excluded from opportunities to manage own enterprises, it implies that it is rather meaningless to improve their access to just one input, water. Instead, the first issue is to get access to the range of factors needed for their own enterprise, such as access to land, other technologies, skills, and markets, *together* with access to water. Access to land, the key resource in agrarian societies, is probably the most important factor (Agarwal 1994).

The need for a broader, holistic perspective on economic opportunities rather than just one input in an enterprise, water, is not limited to the collective irrigation schemes and Water Users Associations. The same principle holds true for other water-related technologies for cropping, such as individual small-scale land and water management technologies, like treadle pumps, bucket drip irrigation, water harvesting, soil conservation, etc. Moreover, the same principles hold true for other water-dependent enterprises than cropping. Women's own access to and control over water-dependent enterprises is an Integrated Gender and Water Attribute[1].

Attribute 7- Integrated: Sharing in Water-related Employment and other Benefits

In the above, we discussed role of water in raising the productivity and profitability in self-employment for women and men as *direct* water users. There are other ways in which women and men can benefit from water. First and foremost, they can find wage employment in water-related enterprises, in a sense, as *indirect* water users. Wage employment is generated in farming, cattle rearing, fishing, forestry, mines, tourism business, etc. Second, women and men can benefit from hydro-power, navigation, and other functions of water in society.

The number and the types of jobs created for women compared to men in water-dependent enterprises is an important Integrated Gender and Water Attribute. For example, a basin in which a large proportion of water is used to create massive employment for poor women would have a Gender and Water Index with a higher score than a basin in which much water is used for tourism that generates benefits only for a small international tourist company and a handful of foreign tourists. 'Jobs per drop for (poor) women and men' is an Integrated Gender and Water Attribute that may influence allocation decisions regarding sectors that give most equitable employment. However, it also refers to realms beyond water management: gender-segregated job markets.

[1] For the specific case of collective irrigation schemes, the International Water Management Institute developed a Gender Performance Indicator for Irrigation that captures the above-mentioned dynamics in further detail. It is based on nine comparative case studies in Asia and Africa. The Gender Performance Indicator for Irrigation is a generic decision-support tool for policy makers, interventionists, and researchers that accommodates huge variation in the gendered organization of farming worldwide. It gives the methodology to assess whether a farming system is a male, dual, or female farming system, and whether gender-based inclusion or exclusion from irrigation institutions takes place at farm, forum, and leadership level. This allows identifying realistic and effective action for gender-inclusive irrigation intervention or, as local reality requires, intervention for women's broader economic empowerment (Van Koppen 2002).

More research needs to be done on measuring 'jobs per drop' as an alternative for economic benefit calculation, expressed as just one overall figure of monetary profits made, ignoring the distribution of water-related wealth between men and women (or poor and non-poor, or any other categories of all citizens).

5. Equal Participation in (Unpaid and Paid) Decision-making

A last set of Gender and Water Attributes with both direct and integrated dimensions has received relatively ample attention: women's and men's equal participation in decision-making bodies on water issues. Above, we already mentioned the usually voluntary community-level drinking water committees and Water Users Associations for irrigation. Decision-making also encompasses other government and non-governmental organizations, both volunteers and professionals, non-profit and commercial. With a growing call for public participation in integrated water resources management from local to basin level, new networks and institutions are being created. Education, training, and research institutes are other bodies involved in decision-making, perhaps more indirectly. With increasing activities of commercial companies in the water sector, gender staffing becomes an important issue there as well. In all these organizations the issue of gender equitable participation arises.

Attribute 8 - Direct: Women's Equal Participation in (Paid and Unpaid) Water-related Decision-making
World-wide, considerable gender gaps have been observed in the composition of decision-making bodies in sector-based water management and integrated water resources management, although gaps are somewhat closing (Athukorala and Tortajada 1998; Schreiner 2001). Direct Gender and Water Attributes for equity in decision-making could encompass characteristics such as:

- the proportion of women in formal or informal institutions at the various levels of decision-making (members, management/leadership, technical staff)
- salary scales for equal work
- access to conventional and modern information channels and quality of information provision to men and women
- intensity of participation in decision-making which can range from just being listened to, to the ultimate decision-making powers.

These attributes would also encompass policies, laws, and other actions for change, and their enforcement, including:

- gender machineries for planning and enforcement at highest decision-making levels
- gender-specific and affirmative recruitment policies, such as quota systems
- capacity building and gender-awareness raising for women and men; networking and organization, exchange visits
- monitoring, evaluation, and other means for enforcement of gender-sensitive measures
- performance evaluation/rewarding of both men and women functionaries for the degree in which they perform their jobs or functions in a gender-sensitive way.
- NGOs for advocacy; movements and campaigns

Attribute 9 – Direct and Integrated: Gender-disaggregated Data
The availability of gender-disaggregated data is a crucial condition for any gender-equitable decision-making. It is also a performance indicator for research institutions and universities, whose primary task is to generate high-quality data. This is valid for general and water-specific data.

Attribute 10 - Integrated: Women's Equal Education and Inclusion in Public Governance
The following phenomena are essential conditions for equal participation in water-related decision-making (and often society's distribution of paid and unpaid tasks as well). They include attributes such as:

- Literacy, Languages, and School Enrolment, which are important for economic opportunity-creation, but also for leadership positions in governing bodies
- Mobility, Transport, and Communication
  Financial and cultural constraints negatively affect women's relative mobility and access to means of communication (telephone, email), which is often required to participate in decision-making
- Participation in Politics, Administration, Networks, etc.
  Decision-making in the water sector is embedded in international, national and local political bodies and government administration, so women's exclusion from these bodies is inevitably reproduced in the water sector. As a corollary, more gender-balance in general public governance spheres can support and cross-fertilize initiatives in the water sector. Especially NGOs are interesting in this regard. Women are well organized in, for example, NGOs in India (e.g. Self Employed Women) or Bangladesh (Grameen Bank, BRAC, Proshika). Such NGOs can be highly instrumental in the implementation of the attributes discussed: minimizing and equal sharing of domestic labor for water supply; ensuring equal employment and other benefits from productive water use; and in equitable decision-making in water-related decision-making forums

6. Conclusion

The totality of above-identified attributes for a Gender and Water Index would help assessing how well a river basin 'performs' from a gender perspective, and where further feasible policy and intervention is needed, in order to ensure that both genders have equal access to water and benefit equally; bear equal costs for using water; and participate equally in (paid and unpaid) water management and decision-making.

It is clear that direct attributes alone are insufficient to reach such broader goals. The integrated attributes identified, for which the relation between gender and water use and management is less visible but plausible, are also important. Yet, for a range of attributes that are manifestations of gender relations per se and that figure high on the world's gender agendas, it is yet to be clarified how they relate to the ecologically sustainable management of freshwater resources. Examples of such gender attributes are reproductive rights issues and fertility and women's and men's health and life expectancy (besides those health aspects related to drinking water, hygiene, and sanitation), dependency ratios for women and men providers, male-female ratios, gendered infanticide, violence against women, women's higher vulnerability for HIV/AIDS, etc. Intuitively, one would expect that such gender characteristics are also

important underlying conditions for river basins to obtain a score 5. However, such relationships have not been explored as yet (except for health impacts of drinking water and hygiene, as at least partially addressed in the Water Poverty Index).

In sum, therefore, if 'gender' is taken as starting point of index development, it not only corroborates the importance of attributes addressed in the empirical research of the Water Poverty Index in South Africa, Tanzania, and Sri Lanka. There is added value in at least three respects. First, this approach underlines the need to address a wider range of direct attributes, including those regarding productive water use and participation in decision-making in general. That implies fostering:

- Minimum costs for safe domestic water
- Shared costs for safe domestic water
- Women's participation in community decision-making
- Women farmers' access to water for productive purposes at farm level
- Women farmers' participation in Water User Associations
- Women's participation in water-related decision-making
- Gender-disaggregated data

Second, it highlights where a narrow focus on water alone would be misleading and where an integrated approach is needed if water policy makers want to be effective and realistic. This implies fostering:

- Women's Access to and Control over Water-dependent Enterprises
- Sharing in Water-related Employment and other Benefits
- Women's education and inclusion in public governance

Last but not least, starting with gender stimulates further analysis of the complex relationships between water and gender, even if a gender-equitable river basin, or society in general, remains utopia for the near future.

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