

Factors Influencing Water Conservation & the Reliability of Human Interdependence Paradigm Scale in Pakistan: A Quantitative Analysis

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Abstract

A study was conducted to examine the relationship of variables from the Norm Activation Model and water conservation behaviors as well as to assess the reliability of the Human Interdependence Paradigm in a Pakistani context. Since water scarcity has become a major environmental threat to the existence of humankind in the 21st century, there is a dire need to look at ways to promote water conservation behaviors and to perpetuate a conservation culture within societal levels. In this study participants from various walks of life, will be asked to fill out a questionnaire that will consist of items incorporating items such as Personal Norms, Awareness of Consequences and Ascription of responsibility as well as items of the Human Interdependence Paradigm scale. The results will be utilized to gain a broader perspective about the Pakistani culture in terms of conservation behaviors and adherence to various environmental worldviews on a subliminal level.

Keywords: Water Conservation Behaviors, Norm Activation Model, Pro-environmental behavior, New Human Interdependence Paradigm, Karachi

1. Introduction

As we all know, water is an essential part of human existence; it is a life sustaining resource and a resource worth waging wars over. The fact of the matter is that, in the quest to cater to the ever growing consumerist society, water scarcity has been added to the very long list of environmental problems that will threaten the existence of every living and breathing creature on this earth. Developing Nations such as Pakistan have been moving from a water stressed country to a water scarce country at an increasingly fast pace (World Bank Report, 2006) and technological ways to curtail the situation is often limited given the fact that, at the end of the day, it is humans who use and abuse this vital resource. Hence, there is now an increasing emphasis on pro-environmental behaviors in the domain of conservation psychology; that focus on behavioral attitudes and beliefs towards an environmental problem e.g. studies on water conservation behaviors (Corral-Verdugo & Frías-Armenta, *et al*, 2002, Gilg & Barr, 2006; Corral-Verdugo, Bechtel & Fraijo, 2003) or studies on energy conservation behaviors (Ibtissem, 2010). Pro-environmental behaviors has been receiving much

attention because researchers are now being drawn to the notion that people perform pro environmental behaviors for a number of reasons such as intrinsic motivations, moral obligations, norms beliefs and attitudes (Gilg & Bar, 2006; Jakovcevic & Steg, 2013; R.Turaga, Howarth, Borsuk, 2010). Therefore there is a need to understand the functionality of this notion in order to promote pro-environmental behaviors in a way that will solve the environmental problems; hence many studies have been conducted to bridge the gap between general environmental beliefs and pro-environmental behaviors such as water conservation behaviors (Adams, 2014). The objectives for this research are to assess the developments that have occurred in environmental world views with regards to the Human Exceptionalism Paradigm, The New Ecological Paradigm and the recent New Human Interdependence Paradigm. We will first assess the studies that have utilized these concepts and then through our primary research we will look at the reliability and predictive capacity of the New Human Interdependence Paradigm Scale in a Pakistani context. Also we will look at the three variables of the Norm activation model to water conservation behavior that has been self-reported by the participants of this study. In doing so we will be able to assess the relationship that these variables have when applied to pro-environmental behavior such as water conservation. This way we are able to gauge the effectiveness of the norm activation model in predicting water conservation behaviors. Other objectives of this research are also to gain a better understanding about the norm activation model and to assess its effectiveness with evidence from other researches to gain support for the model. Once we have established this, we will further analyze the various theories that have already been applied to predict water conservation behaviors such as the New Environmental Paradigm, Time Perspective theory etc. Through this research we will also be able to disprove or prove our hypotheses, as stated below: The hypotheses for this research were : 1) As compared to males, females engage in more water conservation actions 2) There is a positive relation between Personal norms and water conservation behaviors 3) There is a relationship between the Awareness of Consequences and water conservation behaviors 4) There is a relationship between the Ascription of Responsibility and water conservation behaviors. 5) The human interdependence paradigm scale is as applicable

and reliable in predicting water conservation behaviors in Pakistan as it is in other countries of the world.

2. Theoretical Framework

It is essential to note how environmental world views, paradigms and perspectives have particularly shifted in the aftermath of environmental disasters and extreme degradation. The traditional world view held at the time when the concept of Sustainable Development hadn't been established yet, was that of the Human Exceptionalism Paradigm (HEP) which was based on the assumption that human beings were unique and superior to other species and were 'exempt from the constraints of nature' (Corral-Verdugo, Carrus, Bonnes, Moser & Sinha, 2008). However, as societies progressed, environmental problems grew and abundance gradually decreased, environmental sociologists began to reject this notion as being unrealistic and began moving towards a new paradigm altogether. This Eco-centric world view was known as the 'New Ecological Paradigm' which was based on the notion that human beings are essentially a part of nature while also being constrained by its natural limitations. The polarity and dichotomy of these two paradigms sparked a huge debate with regards to the fact that societies exploit natural resources to survive, but they prosper only by compromising their own survival in the long-run. Therefore the need to establish a more comprehensive and non-dichotomous way of thinking brought about the creation of the New Human Interdependence Paradigm which holistically linked the need to conserve with the need for human progress while placing an emphasis on pro-environmental behaviours to bring about conservation. Pro-environmental behaviours have been receiving much attention because researchers are now being drawn to the notion that people engage in pro environmental behaviours for a number of reasons such as intrinsic motivations, moral obligations, norms, beliefs and attitudes. The Norm Activation Model deals with precisely this aspect, however, a negligible amount of work has been done with regards to its application to water conservation especially in the context of Pakistan. Schwartz (1977) Norm Activation Model (NAM) is based on the assumption that people assemble self-expectations (Personal norms) that influences the way one outwardly behaves. The first variable of the NAM is personal norm (e.g. I feel a personal obligation to turn off the tap while brushing my teeth) which refers to the feelings of moral obligation to behave in a certain way. The second variable, Awareness of consequences (AC) (e.g. I feel it is important to conserve water to avert water shortages) is the awareness of negative consequences associated with not behaving pro-socially. The third variable, Ascription of Responsibility (e.g. I feel I have a responsibility to conserve water to create a sustainable future), deals with the feeling of responsibility for the occurrence of those negative consequences. This model suggests that higher the adherence to these variables, the higher will be the probability of individuals behaving pro-environmentally.

3. Methodology

In this research Convenience Sampling method of sampling was used to achieve a sample size of 250 sample individuals. Respondents were asked to fill out a

questionnaire online via Google docs' survey link. The questionnaire utilized for this research paper consisted items pertaining to the socio-demographics of the participants, the next 5 items pertaining to Personal Norms, 4 items assessing awareness of consequences, 4 items assessing ascription of responsibility, the last 8 items pertaining to the participants water conservation behaviors and the rest will be pertaining to the Human Interdependence paradigm in a Pakistani context. The Cronbach alpha of the New Human Interdependence Paradigm Scale as seen from prior research (Schultz *et al*, 2011) is 0.88 which determines the reliability of the scale. However, the reliability will be further determined in during the course of this research.

4. Results

To test the Hypothesis 1: that 'As compared to males, females engage in more water conservation actions'; Independent Sample T Test was used. Results showed as compared to males, females were engaging in water conservation behaviors to a lesser degree ($M=22.6320, SD=5.47212$), while on the other hand, male participants self-reported to have engaged in water conservation behaviors more often than females ($M=23.9760, SD=5.73960$). $T(50) = -1.895, P > 0.05$. In order to test the next three hypotheses, Pearson Correlation was used; (Table 4.2) depicts a summary of all three hypotheses. The hypotheses mainly are an application of the Norm Activation Model (Schwarz, 1977): 1) There is a Positive relationship between the Personal Norms and water conservation behaviors, 2) There is a Relationship between Awareness of Consequences and Water conservation Behaviors, 3) There is a Relationship between the ascription of responsibility to conserve and water conservation behaviors. Hypothesis 2: To Test whether there is a positive relationship between Personal Norms (5 items) i.e. (I feel a personal obligation to turn off the tap while brushing my teeth, I feel a personal obligation to not waste water in general etc.) and Water Conservation Behaviors (8 items) (I have a shower in less than 5 minutes, I wash clothes on alternate days etc.); Pearson Correlation was used. The results showed that $r = 0.163, P < 0.5$. Hypothesis 3: To Test the relationship between Awareness of Consequences (4 items) i.e. ('I feel it is important to conserve water to avert water shortages', 'I feel no pressure to conserve water at the moment etc.) and Water Conservation behaviors (8 items) ('I turn off the tap while washing dishes', 'I Recycle water from the washing machine for flushing purposes' etc.); Pearson Correlation was used. The results showed that $r = -0.001, P > 0.05$. Hypothesis 4: To Test the relationship between Ascription of Responsibility (4 items) i.e. ('I feel that I am responsible for the problem of water scarcity in Karachi', 'I feel it is my responsibility to conserve water') and Water conservation Behaviors (8 items) ('I use the flush frequently', 'I repair any leaky faucets'); Pearson Correlation was used. The results showed $r = 0.227, P < 0.000$. Hypothesis 5: The Cronbach alpha reliability of the Human Interdependence Paradigm Scale in a Pakistani context. The Human Interdependence Paradigm Scale has 9 items e.g. (Human beings can progress only by conserving nature's resources; Human beings can enjoy nature only if they use its resources wisely.) The results

indicate that its reliability in assessing water conservation behaviors in Pakistan was 0.897.

5. Discussion and Analysis

After statistical analysis of our first hypothesis, As compared to males, females engage in more water conservation actions' we can conclude that our hypothesis is being rejected and we have found that this particular hypothesis is not supported. Hence, we cannot conclude that as compared to males, females engage in more conservation actions. Furthermore on the other hand, we can see that in this particular study, males had a higher mean in their conservation actions as compared to males, however by a very small difference. This disapproval of the hypothesis can be attributed to the fact that the sample size was not as diverse as it should have been and also it was not taken into consideration whether males from a particular age group engaged more often in water conservation as compared to their female counterparts. This is to suggest that perhaps, the males that had taken part in the study were highly concentrated in one age group, while on the other hand, females who had taken part in the study were from various age groups; therefore the tests hadn't taken this variable into consideration. The results of this particular hypothesis does not seem to be in line with the results conducted by Zelezny, Chua & Aldrich (2000), who conducted a study on gender differences in males and females in environmental attitudes and behaviors, have provided evidence for the fact that females have shown a stronger inclination towards pro-environmental behavior. However, the study examined the gender differences in primary school pro-environmental behavior, as well as examined self-reported pro-environmental behavior of males and females across 13 countries. The results indicated that the gender differences in pro-environmental behavior can be attributed towards the way that males and females are socialized in different ways. Hence, we can infer from this conclusion that the increase in males engaging in water conservation behavior could have been because of the ways in which both genders are being socialized to take on a more equal role in society. The results of Hypothesis 2 which tested whether there was a positive relationship between Personal Norms and water conservation behavior, suggests that there was a positive relationship, hence the hypothesis is approved. This conclusion advocates that Personal Norms, such as the moral obligations and the individual's personal value, beliefs and norms are of paramount importance in predicting water conservation behavior. If the person feels a personal and moral obligation to perform a certain action, this intrinsic feeling will in turn culminate in the person actually performing the behavior. The results of this hypothesis have been consistent with the results of many other studies for example, a study by Harland, Stats & Wilke (2007) also found that personal norms were strongly related with pro-environmental behavior as well as a study by Vinning & Ebreo, 2002 has also indicated the significance of personal norms in predicting pro-environmental behavior such as waste reduction. This has serious implications for policy makers and environmental activists to target this aspect in order to promote and encourage pro-environmental behavior such as water conservation. Environmental campaigns could then focus

more on psychological aspects of the people in order to save the environment and promote water conservation behaviors. The results of hypothesis 3, which tested whether there was a relationship between Awareness of Consequences and water conservation behavior, suggests that indeed there was not a significant relationship; hence the hypothesis has been disproved. According to the statistical analysis, however its results can be attributed towards the fact that the items of that particular portion was not as clear as it should have been. The results have not been conclusive with other studies such as that of Harland, Stats & Wilke (2007), which suggests that there is a strong relationship of awareness of consequences and personal norms with pro-environmental behavior. This means that people focus on prevention by means of feeling morally obliged to save the environment and ward off situations that have brought about the environmental issue. This is has important implications for environmental activists and campaigners so that they are able to understand what appeals to people more, that is, if they are well informed about the consequences that their actions are having on the environment, it may lead to them pursuing pro-environmental behaviors in order to curtail the situation. The results of hypothesis 4, which tested the relationship between Ascription of Responsibility and water conservation behaviors, have suggested that there is indeed a relationship between Ascription of responsibility and water conservation. Thus, this proves our hypothesis and suggests that those who assign responsibility to themselves for the consequences of their actions and feel a sense of responsibility, are more likely to engage in water conservation behaviors. The results show that its relationship with water conservation behaviors was as strong as that of personal norms and water conservation. The approval of this hypothesis has important implications such that policy makers are able to understand what to focus more on promoting a sense of commitment and responsibility in the minds of individuals in order to solve environmental problems. This research gives us an insight into the framework of the Norm Activation Model and how we can use this model to predict water conservation behaviors. It is an important aspect to understand the psychological and cognitive processes that underlie ones willingness, commitment and awareness to perform a certain behavior. Moreover, future research must utilize larger samples from diverse backgrounds and diverse age groups in order to gain a clearer picture and a more reliable indication of the this systematic process that leads to water conservation as its outcome. Furthermore, research experiments could incorporate post-hoc tests that could evaluate the extent to which manipulated external stimuli may affect these three variables in producing or promoting water conservation to a greater extent. Thus, there is more potential further research that can also look at how the variables of the Norm Activation Model interact with each other in order to bring about the desired behavior. The results of our 5th hypothesis are quite a major breakthrough for my research as well as for water conservation in a Pakistani context. The results had indicated that the New Human Interdependence Paradigm scale was reliable when tested amongst participants living in Pakistan. The New Human Interdependence Paradigm is gaining popularity as the New Ecological Paradigm scale

was seen as a less significant predictor of pro-environmental behaviors, the NHIP scale is becoming widely known and many researchers such as Coral Verdugo,(2008) have been testing it in various countries to assess its reliability in various cultural settings. Therefore the results of this particular hypothesis is quite significant in the environmental realm, knowing this, we are able to gain insights into the world views being held from one country to another; we wanted to know what factors influence water conservation behaviors, and whether the adherence to a particular world view is a significant predictor of these pro-environmental behaviors. Through this research we were able to see whether western ideas are different from that of eastern origin, whether western countries believe less in behaving in pro-environmental behaviors because of their quest for purely economic gains, and whether eastern countries depend more on their natural resources for their daily sustenance, hence adhere more towards a specific set of world views. The results of the NHIP scale's predictive capacity is a major breakthrough for the environmental field in Pakistan, now that we have gauged this, we can come up with strategic plans on working our way around it in order to increase people's adherence towards these paradigms that might influence their pro-environmental behaviors, thus alleviating many of our environmental problems that we are facing today. All in all, this research provides a platform to initiate more research for the domain of water conservation behaviors in order to solve the environmental issue of the 21st century that is gaining momentum at a very fast pace

References

- Adams, E. (2014). Behavioral Attitudes towards Water Conservation and Re-use among the United States Public. *Resources and Environment*, 4(3), pp. 162-167
- Bechtel, R. B., Corral-Verdugo, V., & Pinheiro, J. Q. (1999). Environmental belief systems: United States, Brazil, and Mexico. *Journal of Cross cultural Psychology*, 30, 122-128.
- Bechtel, R. B., Corral-Verdugo, V., Asai, M., & González, A. (2006). A crosscultural study of environmental belief structures. *International Journal of Psychology*, 41, 145-151.
- Buttel, F. (1987) *New Directions in Environmental Sociology Annual Review of Sociology*, Vol. 13 (1987), pp. 465-488.
- Catton Jr., William R.; Dunlap, Riley E. *Environmental sociology: a new paradigm. American Sociologist* . Feb78, Vol. 13 Issue 1, p41-49. 9p.
- Clark, W., & Finley, J. (2007). Determinants of Water Conservation Intention in Blagoevgrad, Bulgaria. *Society and Natural Resources*, 20(7), 613-627.
- Corral-Verdugo, V., & Pinheiro, J. (2006). Sustainability, future orientation and water conservation. *European Review of Applied Psychology*, 56, 191-198.
- Corral-Verdugo, V., Bechtel, R. B. & Blanca, Fraijo-Sing. (2003). Environmental beliefs and water conservation: An empirical study. *Journal of Environmental Psychology*, 23, 247-257.
- Corral-Verdugo, V., Carrus, G., Bonnes, M., Moser, G. & Sinha, J. (2008). Environmental beliefs and endorsement of Sustainable Development principles in water conservation: towards a New Human Interdependence Paradigm scale. *Environment and Behavior*, 40, 703-725.
- Corral-Verdugo, V., Frías, M., Pérez, F., Orduño, V., & Espinoza, N. (2002). Residential water consumption, motivation for conserving water, and the continuing tragedy of the commons. *Environmental Management*, 30, 527-535.
- De Groot, J. I. M., Steg, L. & Dicke, M. (2007). Morality and Reducing Car Use: Testing the Norm Activation Model of Pro social Behavior. In F. Columbus (Ed.), *Transportation Research Trends (in press)*, NOVA Publishers.
- De Groot, J., & Steg, L. (2008). Value orientations to explain beliefs related to environmental significant behavior: How to measure egoistic, altruistic, and biospheric value orientations. *Environment and Behavior*, 40(3), 330-355.
- De Groot, J., & Steg, L. (2009). Morality and pro social behavior: The role of awareness, responsibility, and norms in the norm activation model. *Journal of Social Psychology*, 149(4), 425-449.
- Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). Measuring endorsement of the new environmental paradigm: A revised NEP Scale. *Journal of Social Issues*, 56(3), 425-442.
- Gilbertson, M., Hurlimann, A. and Dolnicar, S. (2011) Does water context influence behavior and attitudes to water conservation? *Australasian Journal of Environmental Management*, 18 (1), 47-60.
- Gilg, A., & Barr, S. W. (2006). Behavioral attitudes towards water saving? Evidence from a study of environmental actions. *Ecological Economics*, 57, 400-414.
- Harland, P., Staats, H., & Wilke, H. (2007). Situational and personality factors as direct or personal norm mediated predictors of pro-environmental behavior: Questions derived from norm-activation theory. *Basic and Applied Psychology*, 29(4), 323-334.
- Bernardo Hernández, Victor Corral-Verdugo, Stephany Hess-Medler & Ernesto Suárez, 2012. The Relationship between Social and Environmental Interdependence as an Explanation of Proenvironmental Behavior. *Human ecology review* Vol.19 (1).
- Hopper, J.R., Neilsen, J.M. (1991). Recycling as altruistic behavior: Normative and Behavioral strategies to expand participation in a community recycling program. *Environment and behavior*, 23(2), 195-220.
- Human Development Report-UNDP, 2006. *Beyond Scarcity: Power, Poverty and Global water crisis*. Retrieved from <http://hdr.undp.org/en>
- Ibtissem, M. (2010). Application of Value Beliefs Norms Theory to the Energy Conservation Behavior. *Journal of Sustainable Development*, 3(2); www.ccsenet.org/jsd
- McDonald, G & Patterson, M. (2007). Bridging the divide in urban sustainability: from human exemptionalism to the new ecological paradigm. *Urban Ecosyst* 10:169-192.
- Pakistan; Strategic Country Environmental Assessment Report: *Rising to the Challenges*, May, 2006
- Schultz, P. W. (2002). Environmental attitudes and behaviors across cultures. In W. J. Lonner, D. L. Dinnel, S. A. Hayes, & D. Sattler (Eds.), *Online readings in psychology and culture*. Bellingham: Western Washington University, Department of Psychology, Center for Cross-Cultural Research. Retrieved from <http://www.wvu.edu/culture>.
- Schultz, P. W., Bonnes, M & Fornara, F. (2011). General environmental attitudes and beliefs: The spatial bias and the NHIP scale. Chap 3, p59-74.
- Schwartz, S. H. (1977). Normative influences on altruism. In L. Berkowitz (Ed.), *Advances in experimental social psychology*, (Vol. 10, pp. 221-279). New York: Academic press.

- Stern P.C. (2000). Towards a coherent theory of environmentally significant behavior, *Journal of social issues*, 56, 3, 407-424.
- Stern, P., Dietz, T., Abel, T., Guagnano, G., & Kalof, L. (1999). A values-belief-norm theory of support for social movements: The case of environmentalism. *Human Ecology Review*, 6(2), 81-97.
- Turaga, R., Howarth, R. & Borsuk, M. (2010). Pro environmental behavior: Rational Choice meets Moral Motivation. *Annals of the New York ACADEMY OF SCIENCES*.1185 (2010) 211–224, 2010.
- Van Liere, K., & Dunlap, R. (1978). Moral norms and environmental behavior: An application of Schwartz's norm activation model to yard burning. *Journal of Applied Social Psychology*, 8, 174-188.
- Vinning, J., Ebreo, A., Cristancho, S. (2002-2003). Responsibility for Environmental Problems and the Consequences of Waste Reduction: A Test of the Norm-Activation Model. *Journal of Environmental Systems*, 29(3) 219-244,
- Vinning.J. & Ebreo, A. (1990). What makes a recycler? A comparison of recyclers and non-recyclers. *Environment and Behavior*, 22(1), 55-73.
- Vinning.J. & Ebreo, A. (1992). Predicting recycling behavior from global and specific environmental attitudes and changes in recycling opportunities. *Journal of Applied Social Psychology*, 22(20) 1580-1607
- World Bank (2006). Pakistan strategic environmental country assessment. Retrieved from <http://go.worldbank.org/VHYXZCYIZ0>
- Williams, J. (2007). Thinking as Natural: Another Look at Human Exemptionalism. *Human Ecology Review*, Vol. 14, No. 2.
- Zelezny, L., Chua, P. & Aldrich, C. (2000). Elaborating on Gender Differences in Environmentalism. *Journal of Social Issues*, 56 (3) 443-457.