Public Participation and Lay Knowledge in Environmental Governance: A Case Study of Community Based Adaptation in Bangladesh

Shahadat Hossain Shakil[1] and Md. Musfiqur Rahman Bhuiya[2]

Abstract: *This paper analyzes the debate of public participation within environmental governance process. In doing so, significance of local knowledge in climate change adaptation process has been evaluated. An adaptation project from the coastal areas of Bangladesh has been selected to reveal more specific result and to focus the study in a very specific angle. Local knowledge has been proved as a vital factor within the adaptation planning for coastal areas in the face of threat posed by climate change. Insights from similar studies has been drawn and evaluated. Finally public participation within the broader domain of environmental governance has been found inevitable.*

Keywords: environmental governance, public participation, local knowledge, climate change adaptation, Bangladesh

Introduction

Stakeholder's participation is a recurrent theme of environmental governance since 1960s, when environmental politics became institutionalized within western developed countries. Scientists, interest groups, media and local protests had significant influence in shaping the definition and resolution of environmental issues (Bulkeley and Mol, 2003). Involving communities and the public in governance makes instrumental sense, by improving the quality of decisions. Collaborative processes enable local actors to place their knowledge in the broader context of what state actors know, and vice versa (Innes et al.., 2007 cited in Taylor and de Loë, 2012). Only recognizing expert knowledge as a valid basis for decision-making excludes the knowledge and experience of people who live and work in ecosystems (Taylor and Buttel, 1992 cited in Evans, 2012). Contextualized knowledge, in turn, can lead to problem-specific responses that are more likely to be accepted and supported by the public (Lach et al.., 2005; van Ast and Boot, 2003 cited in Taylor and de Loë, 2012).

In contrast with the above mentioned supportive statement in favor of public participation and local knowledge integration in environmental policy making, German social theorist Ulrich Beck (1999) argued that politics is the key driver behind this inclusion of stakeholders process in the face of *risk society.* He states that,

[1]Postgraduate Student (MSc. Environmental Governance), School of Environment, Education and Development (SEED), The University of Manchester; E- mail: shakil.shahadathossain@postgrad.manchester.ac.uk
[2] Undergraduate Student, Department of Urban and Regional Planning, Bangladesh University Engineering and Technology, Dhaka, Bangladesh. Email: musfiq.sifat@gmail.com

> "in the face of this 'risk society', the conventional political institutions of modernity are increasingly…inadequate…as decision-making power, control and legitimacy increasingly locate outside the political system…which were previously considered un-political" (cited in Bulkeley and Mol, 2003).

Additionally, exclusions can become inherent in a decision making process, as the skills and knowledge required participating in deliberations restrict who is authorized to speak, along with what and how issues are debated (Demeritt, 2001 cited in Taylor and de Loë, 2012). Moreover, it is crucial to recognize the subtleties and complexities inherent in efforts to engage the public in decision-making and to avoid simplistic assumptions about the efficacy, transparency and public reach of community involvement processes (Rydin and Pennington, 2000; Cooke and Kothari, 2001cited in Few et al.,. 2007).

In light of the discussion above this paper will assess the significance of public participation within environmental governance process through focusing on the importance of local knowledge in environmental decision making. As a case study specific community based adaptation project will be used to evaluate the research question mentioned earlier. Because,

> "increase public involvement in many spheres of environmental management, to tackle future climate risks has been a logical step; this is particularly so for climate change adaptation, which is likely to be organized mostly at a non-global scale"(Adger, 2001).

Adaptive actions tend to be context and place specific, with implications for relatively delimited sets of stakeholders and requiring a knowledge base tailored to local settings (Few et al.., 2007). Additionally, during community based adaptation process a combination of scientific knowledge and local knowledge is used for informed decision making (Reid et al.., 2009).

Case Study

Practical Action Bangladesh in association with Asian Development Bank executed a project titled "*Community Based Adaptation in Vulnerable Coastal Areas of Bangladesh – Innovation to Build Resilience*". This project has been implemented in Shyamnagar and Kaliganj upazilas (lower tier of district) of Satkhira district (Figure-1) from March 2011 to April 2013.The main goal of this initiative has been to improve the resilience of vulnerable community against natural disasters (cyclones, storm surge) and its following effects (salt water intrusion and salinity), climate change, climatic variability and extreme weather events (Practical Action Bangladesh, 2012). A Number of activities has been initiated under the project in association with local community and combining their inherited knowledge (to adapt with the changing climate) with the scientific knowledge and best practices (i.e. adaptive agriculture, adaptive aquaculture, local weather forecasting board, artificial aquifer tube well and community shelter home) (adopted from Practical Action Bangladesh and ADB 2013a). In this essay only *adaptive agriculture practice* will be focused on to evaluate the significance of local knowledge supported by the scientific community.

Salt water intrusion has affected surface and ground waters in the study area for the last couple of decades, leading to severe scarcity of water to drink and to irrigate crop fields. Soil salinity further threatened their agricultural practices shifting from rice-based farming to shrimp-farming base (Practical Action Bangladesh and ADB, 2013a). Modifying the threats to crop production is the most practiced adaptation strategy in Bangladesh (Ahmed, 2006 cited in Pender and Alliance, 2010). Traditionally they are coping with this threat through developing salt tolerant rice variety, homestead gardening and alternative livelihood options (Miah, 2010). Recent government initiatives like developing high yield salt tolerant rice variety through research in association with the local community's knowledge and available adaptive species fostered this process (Rabbani, 2013; Berger and Ali, 2008).

(a) (b)

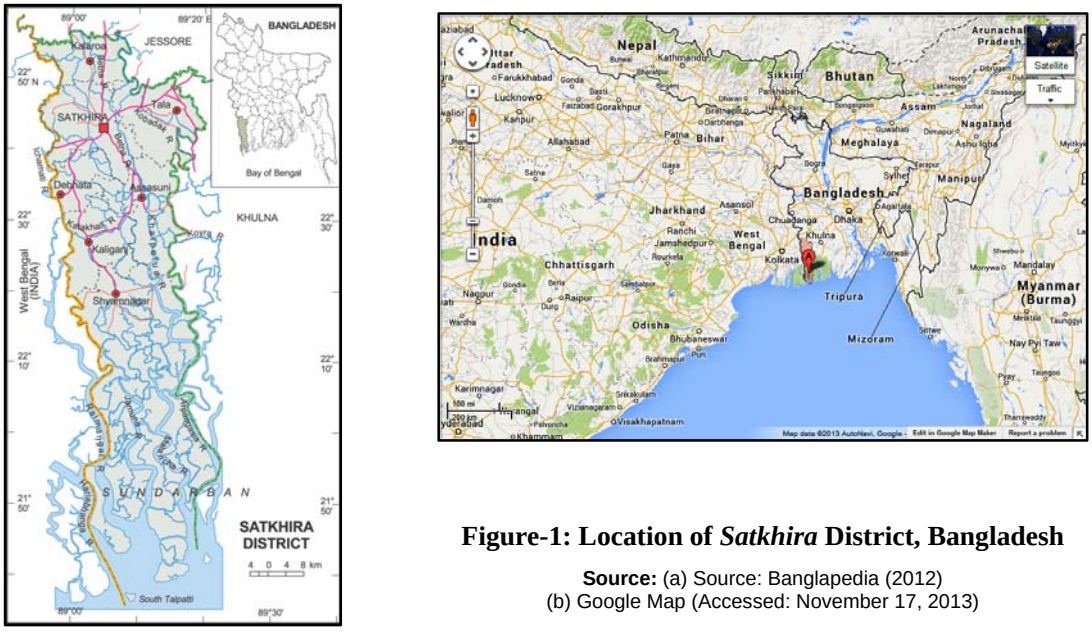

Figure-1: Location of *Satkhira* District, Bangladesh

Source: (a) Source: Banglapedia (2012)
(b) Google Map (Accessed: November 17, 2013)

An innovative rice-based agricultural system has been adopted in this cyclone affected, saline-prone, increasingly shrimp-farm dominated *Satkhira* district. To overcome the problem of irrigation during cropping season mini ponds are excavated adjacent to crop field to hold the rain water (Figure-2). During the rainy season low-saline tolerant fishes (i.e. monosex tilapia or carps) are traditionally cultivated and during dry season it is being used as a source of irrigation (Practical Action Bangladesh and ADB, 2013b). Different types of salt tolerant rice verities (i.e. BINA 8, BRRI Dhan 47, 48, 54 etc.) have been introduced and tried on a trial and error basis by the communities themselves as well as along with government research organizations (Practical Action Bangladesh and ADB, 2013b; Rabbani, 2013; Miah, 2010). Yearly cropping schedule has been also adapted with the changing

climate. Recently pulse and other vegetables are cultivated along with rice for better utilization of limited resources (*Ibid.*)

Figure-2: Rice Based Adaptive Copping System at *Satkhira*

Source: Practical Action Bangladesh and ADB (2013b)

Saline tolerant rice varieties have been also traditionally practiced in southern coastal areas of Sri Lanka in the face of climate change but producing low yield. Recent government led innovation of more resilient species with successful field trial experiment along with the local communities led to more adaptive capacity (Berger et al.., 2009). In addition, Leonard et al.. (2013) discussed the role of traditional ecological knowledge of the indigenous people (at north-west Australia) in monitoring and adapting to changing environmental conditions. For instance, indigenous people observe the flowering of the *Gali-Galing (Fern-leaf grevillea)* signals as the beginning of the cold season and is time to undertake traditional burning practices to prevent late hot season fires that damage the landscape. Moreover, one of the major coping strategies of the indigenous women's in the hill tracts of Bangladesh is preserving the rice verities that are more resilient which has been in practice for the last several generations (Maleya and The Women's Resource Network, 2011). Furthermore, Boillat and Berkes (2013) highlighted how Bolivian farmers traditionally anticipate/forecast the next season's rainfall and making agricultural decisions accordingly through dispersing sowing in time and space, and accessing plots at different altitudes and aspects.

Discussion

From the above mentioned studies it can be inferred that local knowledge is playing a significant role in environmental decision making under various circumstances. In case of *Satkhira* the solution (pond irrigation system) has been derived by the locals based on specific needs prior to government and NGO interventions (Ahmed, 2006; Miah, 2010; Pender and Alliance, 2010). In Sri Lanka high yield rice variety has been developed based on the locally established low yield species and further research by the scientists; and has been validated by local farmers via trial and error basis (Berger et

al.., 2009). In case of the indigenous women's of Bangladesh hill tracts, preserving traditional high yield and resilient rice varieties is the only available solution till now due to lack of alternatives and less progress of research in this arena (Maleya and The Women's Resource Network, 2011; Rabbani, 2013). Additionally, in case of indigenous people of north-west Australia, scientific records of climate-related events (including extreme weather, water availability, and phenology) are limited in number and time-scale as well as dispersion process is also not well-developed (Leonard et al.. 2013, p.629). Similar scenario is also applicable for the instance of Bolivian farmers (Boillat and Berkes 2013, p.10).

Other reasons for local knowledge's significance over scientific knowledge are - local people's difficulties using scientific information due to lack of accessibility and expertise; climate models weakness in terms of spatial and temporal scale; failure of data from meteorological station to fulfill the specific and changing demand of the farmers due to climate variability; and needs of scientific data to be verified with local data to ensure credibility (Reid et al.. 2009, p.22; Christian Aid, 2009). In contrast, while "local communities has less confidence on scientific data in question of reliability, … scientists are reluctant about local data because of subjectivity and lacking in rigorous" (Gaillard and Maceda, 2009). This conflict is termed by Petts and Brooks (2006) as "continuing gulf between the techno-centrism of the expert and the contextual knowledge of the lay public".

In the above mentioned cases local knowledge playing crucial role in environmental decision making, but due to continuous climate variability it's now facing the challenge to adapt effectively (i.e. Satkhira, Sri Lanka). So, it can be said undoubtedly that combinations of scientific knowledge and local knowledge can be more efficient, which is also explored in earlier case studies. Echoing the above findings Tanner (2005) declared that,

> "[t]here is clearly a need to bring the scientific expertise on future climate changes and adaptation techniques, together with the experience, traditional knowledge and locally defined vulnerabilities of the community, so that the best information from both sources can be combined into a strong community based adaptation response" (cited in Pender and Alliance, 2010, p.52).

On the other hand, while combining these two streams of knowledge through public participation intensive scrutiny about the inherent power relation of different stakeholders [mentioned earlier by Demeritt (2001)] should be taken into account because, "often the priorities and interests of outsiders override those of communities, and there is still a lot of 'doing to' communities, rather than communities taking charge"(Reid et al.. 2009, p.23). To overcome the complexity during public participation [introduced earlier by Rydin and Pennington (2000); Cooke and Kothari (2001)] innovative and subject specific approach should be taken which has been illustrated by Rouse et al.. (2013) while coastal adaptation planning of New Zealand. Additionally, according to Few et al.. (2007),

> "in order for the participation to be meaningful, this would…require a retreat from managerialism and a preparedness among agencies to place trust in the deliberative capabilities of stakeholders to propose plans that are both effective and equitable",

which has been concluded during their study on long term coastal management of UK.

Furthermore, to support another issue of debate ("legitimize the *risk* through participation") introduced by Beck (1999) earlier, Few (2001, 2003) has described a process whereby planning agencies have (consciously or subconsciously) attempted to steer stakeholder participation toward support for predetermined goals by forging tactical alliances, blocking dissent and avoiding scope for conflict. The result may be described as 'containment' of participation (cited in Few et al.. 2007, p.53).

Conclusion

As conclusion, local knowledge is significant equally as the scientific knowledge (in some cases surpasses) in environmental decision making and planning, in the era of complex challenge imposed by climate change, to adapt and sustain (Reid et al.., 2009; Taylor and de Loë, 2012). However, public knowledge should be subject to similar levels of critical scrutiny and questioning concerning its validity and trustworthiness as is expert understanding (Petts and Brooks, 2006). But at the end question remains about the legitimation of the climate change risk through community based adaptation process; in the era of continuous GHG emission production on one side by the global elites, and call as well as funding for community based adaptation on the other side by the same entity.

References

Adger, W. Nei. 2001. "Scales of Governance and Environmental Justice for Adaptation and Mitigation of Climate Change." *Journal of International Development* 13(7):921–31. Retrieved November 28, 2013 (http://doi.wiley.com/10.1002/jid.833).

Ahmed, Ahsan Uddin. 2006. *Bangladesh Climate Change Impacts and Vulnerability: A Synthesis*. Dhaka, Bangladesh: Climate Change Cell, Dept. of Environment : Comprehensive Disaster Management Programme, Govt. of the People's Republic of Bangladesh.

Banglapedia. 2012. "Satkhira District." *Banglapedia - National Encyclopedia of Bangladesh*. Retrieved November 18, 2013 (http://www.banglapedia.org/HT/S_0156.htm).

Beck, Ulrich. 1999. *World Risk Society*. Wiley.

Berger, Rachel, and Mohammad Ali. 2008. "Adaptation in South Asia." *Tiempo* (68):22–24. Retrieved November 29, 2013 (http://www.tiempocyberclimate.org/portal/archive/pdf/tiempo68high.pdf).

Berger, Rachel, Rohana Weregoda, and BeVaruna Rathnabharathierger. 2009. "Participatory Rice Variety Selection in Sri Lanka" edited by Hannah Reid, Mozaharul Alam, Rachel Berger, Terry Cannon, and Angela Milligan. *Participatory Learning and Action (PLA) : Community-based Adaptation to Climate Change* 60:88–98. Retrieved November 15, 2013 (http://pubs.iied.org/pdfs/14573IIED.pdf).

Boillat, Sébastien, and Fikret Berkes. 2013. "Perception and Interpretation of Climate Change among Quechua Farmers of Bolivia: Indigenous Knowledge as a Resource for Adaptive Capacity." *Ecology and Society* 18(4):1–13. Retrieved December 1, 2013. (http://www.ecologyandsociety.org/vol18/iss4/art21/).

Bulkeley, Harriet, and Arthur P. J. Mol. 2003. "Participation and Environmental Governance: Consensus, Ambivalence and Debate." *Environmental Values* 12(2):143–54. Retrieved November 17, 2013 (http://www.erica.demon.co.uk/EV/EV1207.html).

Christian Aid. 2009. "Developing a Climate Change Analysis" edited by Hannah Reid, Mozaharul Alam, Rachel Berger, Terry Cannon, and Angela Milligan. *Participatory Learning and Action (PLA) : Community-based Adaptation to Climate Change*

60:141–48. Retrieved November 15, 2013. (http://pubs.iied.org/pdfs/14573IIED.pdf).

Cooke, Bill, and Uma Kothari. 2001. *Participation: The New Tyranny?* Zed Books.

Demeritt, David. 2001. "The Construction of Global Warming and the Politics of Science." *Annals of the Association of American Geographers* 91(2):307–37. Retrieved November 18, 2013. (http://onlinelibrary.wiley.com/doi/10.1111/0004-5608.00245/abstract).

Evans, J. P. 2012. "Participation and Politics."pp. 187–209 in *Environmental Governance*. Oxon: Routledge.
Few, Roger. 2001. "Containment and Counter-Containment: Planner/Community Relations in Conservation Planning." *The Geographical Journal* 167(2):111–24. Retrieved December 1, 2013. (http://www.jstor.org/stable/3060482).

Few, Roger. 2003. "Participation or Containment? Insights from the Planning of Protected Areas in Belize." Pp. 23–44 in *Participatory Planning in the Caribbean: Lessons from Practice*, edited by Jonathan Pugh and Robert B. Potter. Ashgate, Aldershot, UK: Ashgate Publishing, Ltd.

Few, Roger, Katrina Brown, and Emma L. Tompkins. 2007. "Public Participation and Climate Change Adaptation: Avoiding the Illusion of Inclusion." *Climate Policy* 7(1):46–59. Retrieved November 18, 2013.
(http://www.tandfonline.com/doi/abs/10.1080/14693062.2007.9685637).

Gaillard, Jean Christophe, and Emmanuel A. Maceda. 2009. "Participatory Three-Dimensional Mapping for Disaster Risk Reduction" edited by Hannah Reid, Mozaharul Alam, Rachel Berger, Terry Cannon, and Angela Milligan. *Participatory Learning and Action (PLA) : Community-based Adaptation to Climate Change* 60:109–18. Retrieved November 15, 2013.
(http://pubs.iied.org/pdfs/14573IIED.pdf).

Hickey, Samuel, and Giles Mohan. 2004. "Towards Participation as Transformation: Critical Themes and Challenges." Pp. 3–24 in *Participation-From Tyranny to Transformation? : Exploring New Approaches to Participation in Development*, edited by Samuel Hickey and Giles Mohan. London, UK & New York, USA: Zed Books.

Innes, Judith E., Sarah Connick, and David Booher. 2007. "Informality as a Planning Strategy: Collaborative Water Management in the CALFED Bay-Delta Program." *Journal of the American Planning Association* 73(2):195–210. Retrieved November 18, 2013. (http://www.tandfonline.com/doi/abs/10.1080/01944360708976153).

IPCC. 2013. "Summary for Policymakers." in *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by Thomas F. Stocker et al.. Cambridge, UK & New York, USA: Cambridge University Press. Retrieved May 10, 2013
(http://www.climatechange2013.org/images/uploads/WGI_AR5_SPM_brochure.pdf).

Lach, Denise, Steve Rayner, and Helen Ingram. 2005. "Taming the Waters: Strategies to Domesticate the Wicked Problems of Water Resource Management." *International Journal of Water* 3(1):1. Retrieved November 18, 2013
(http://www.inderscience.com/info/inarticle.php?artid=7156).

Leonard, Sonia, Meg Parsons, Knut Olawsky, and Frances Kofod. 2013. "The Role of Culture and Traditional Knowledge in Climate Change Adaptation: Insights from East Kimberley, Australia." *Global Environmental Change* 23(3):623–32. Retrieved November 29, 2013. (http://www.sciencedirect.com/science/article/pii/S0959378013000423).

Maleya, Shenjuti Khisa, and The Women's Resource Network. 2011. "The Women of the Chittagong Hill Tracts and Their Experiences of Climate Change." Pp. 127–42 in *Indigenous Women, Climate Change and Forests*, edited by Wilfredo V.

Alangui, Grace Subido, and Ruth Tinda-an. Philippines: Tebtebba Foundation. Retrieved November 28, 2013
(http://www.tebtebba.org/index.php/content/196-iw-cc-tfm).

Miah, Md. MuslemUddin. 2010. *Innovative Farming Practices Related to Climate Change in the Vulnerable Areas of Bangladesh*. Dhaka, Bangladesh: BCAS, UNEP. Retrieved November 25,2013.
(http://www.apfedshowcase.net/sites/default/files/Final%20Report%20of%20UNEP%20APFED%20-BCAS.pdf).

Pender, James S., and A. C. T. Alliance. 2010. *Climate Change, Its Impacts and Possible Community Based Responses in Bangladesh*. 2nd ed. Dhaka, Bangladesh: Church of Bangladesh. Retrieved November 29, 2013
(http://uploads.ecocongregationscotland.org/uploads/Climate%20Change%20in%20Bangladesh_Sept%202010.pdf).

Petts, Judith, and Catherine Brooks. 2006. "Expert Conceptualizations of the Role of Lay Knowledge in Environmental Decision Making: Challenges for Deliberative Democracy." *Environment and Planning A* 38(6):1045–59. Retrieved November 18, 2013
(http://www.envplan.com/abstract.cgi?id=a37373).

Practical Action Bangladesh. 2012. *Annual Report 2012*. Dhaka, Bangladesh. Retrieved November 30, 2013
(http://practicalaction.org/media/preview/26300).

Practical Action Bangladesh, and ADB. 2013a. *Community-Based Adaptation: Innovation to Build Resilience*. Dhaka, Bangladesh: Practical Action Bangladesh Resident Mission & Asian Development Bank. Retrieved November 15, 2013
(https://practicalaction.org/media/preview/28852).

Practical Action Bangladesh, and ADB. 2013b. *Rice-Based Cropping System*. Dhaka, Bangladesh: Practical Action Bangladesh

Resident Mission & Asian Development Bank. Retrieved November 15, 2013 (http://practicalaction.org/media/view/28851).

Rabbani, Golam. 2013. "Adaptation Technologies in Agriculture: Experiences from Bangladesh."

Reid, Hannah et al.. 2009. "Community-Based Adaptation to Climate Change: An Overview" edited by Hannah Reid, Mozaharul Alam, Rachel Berger, Terry Cannon, and Angela Milligan. *Participatory Learning and Action (PLA) : Community-based Adaptation to Climate Change* 60:9–38. Retrieved November 15, 2013 (http://pubs.iied.org/pdfs/14573IIED.pdf).

Rouse, Helen et al.. 2013. "Coastal Adaptation to Climate Change: A New Zealand Story." *Journal of Coastal Research* (Special Issue No. 65):1957–62. Retrieved December 1, 2013. (http://ics2013.org/papers/Paper3907_rev.pdf).

Rydin, Yvonne, and Mark Pennington. 2000. "Public Participation and Local Environmental Planning: The Collective Action Problem and the Potential of Social Capital." *Local Environment* 5(2):153–69. Retrieved November 28, 2013 (http://www.tandfonline.com/doi/abs/10.1080/13549830050009328).

Taylor, Brent, and Rob C. de Loë. 2012. "Conceptualizations of Local Knowledge in Collaborative Environmental Governance." *Geoforum* 43(6):1207–17. Retrieved October 5, 2013. (http://linkinghub.elsevier.com/retrieve/pii/S001671851200067X).

Taylor, Marilyn. 2007. "Community Participation in the Real World: Opportunities and Pitfalls in New Governance Spaces." *Urban Studies* 44(2):297–317. Retrieved November 17, 2013. (http://usj.sagepub.com/cgi/doi/10.1080/00420980601074987).

Taylor, Peter J., and Frederick H. Buttel. 1992. "How Do We Know We Have Global Environmental Problems? Science and the Globalization of Environmental Discourse."*Geoforum* 23(3):405–16. Retrieved November 18, 2013 (http://www.sciencedirect.com/science/article/pii/0016718592900515).

Van Ast, J. A., and S. P. Boot. 2003. "Participation in European Water Policy." *Physics and Chemistry of the Earth, Parts A/B/C* 28(12–13):555–62. Retrieved November 18, 2013. (http://www.sciencedirect.com/science/article/pii/S1474706503000949).