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PARTICIPATORY RURAL APPRAISAL APPROACHES: AN OVERVIEW AND AN EXEMPLARY APPLICATION OF FOCUS GROUP DISCUSSION IN CLIMATE CHANGE ADAPTATION AND MITIGATION STRATEGIES

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Abstract

Different tools and techniques of participatory approaches are the basic way of conducting qualitative research especially in the field of applied social science. Focus Group Discussion (FGD) is one of the main Participatory Rural Appraisal (PRA) technique often used in combination with others to achieve desired goals. Considering this concept, this paper attempts to review the PRA approach and then application of FGD, in combination with matrix scoring and ranking to identify problems and causes of climate change along with possible mitigation and adaptation strategies. A group of 20 students at post graduate level under the faculty of Agriculture and Horticulture at Humboldt University of Berlin, Germany those from different corner of the world was considered as target people of the study. The results concluded that “unpredictable weather events” was ranked as the present outstanding visible climate change problem caused by “human activities”. However, it was noted that if alternative renewable energy sources are exploited, this could contribute to solving the present climate change problem. This finding might have the good reference for the policy makers in the same line not only for developing countries but also for developed countries.

Keywords: PRA, FGD, Climate Change, Adaptation and Mitigation

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Introduction

PRA is a process which extends into analysis, planning and action. The World Bank defines PRA as a ‘family of participatory approaches and methods which emphasize local knowledge and enable local people to do their own appraisal, analysis and planning. ‘PRA uses group animation and exercises to facilitate information sharing, analysis and action among stakeholders’ (World Bank, 1995).

It originated in the early 1990's, deriving its basic principles from activist participatory research, agro-ecosystem analysis, applied anthropology, field research on farming systems and most significantly Rapid Rural Appraisal (RRA). While there is no concrete definition, RRA can be defined as a series of techniques for research that are claimed to generate results of less apparent precision, but greater evidential value, than classic quantitative survey techniques'. From parallel research work in different parts of the world, RRA emerged as an idea in the 1970's. Later in the 1980's the word “Participatory” found footing in RRA. At the 1985 Khon Kaen International Conference a typology of seven

types of RRA were generated, (KKU, 1987) of which “Participatory Rapid Rural Appraisal” (PRRA) was one. From here RRA further evolved to PRA in 1988 – 1990 mainly in Kenya & India at NGO's and various government bodies. This was then promoted by bodies like International Institute for Environment and Development (IIED), Ford Foundation (FF) and Swedish International Development Cooperation Agency (SIDA). In RRA, information is more elicited and extracted by outsiders while in PRA it is more shared and owned by the locals (Chambers, 1994). Alam and Ishan (2012) explained that PRA is the most suitable and appropriate method to identify the existing situation of the community. Recently, PRA has come to mean Participatory Reflection and Action (Chambers, 2007) while Participatory Learning and Action (PLA) method, which is much broader and includes other related or similar approaches is sometimes equally used in the place of PRA (Chambers, 2007).

In the three decades from its origin PRA witnessed a period of constant evolution. At the core of these changes was the goal to address two

primary concerns, which were not tackled by the pre-existing research methods. First was to integrate local perspective in the development process by becoming more responsive to local people and local situations. Second was to develop an adaptive methodology that would provide timely and cost effective information.

Today the principles of PRA are: 1) 'handing over the stick' which means surrendering authority to local people in the learning processes, 2) ability to conduct critical examination by and of facilitators of their own roles, personal responsibility i.e. 'using one's own best judgment at all times', 3) multi way sharing of ideas and information and 4) stimulation of 'community awareness' (Chambers, 1992; Chambers, 1997; Weber and Ison, 1995).

Its applications include but are not limited to general analysis of a specific topic, question, or problem; needs assessment; feasibility studies; identification and establishment of priorities for development or research activities, monitoring and evaluation of development or research activities and identification of conflicting interests between groups. This is usually achieved by use of one or more tools of PRA. This paper aims at: 1) briefly clarify the theoretical concepts of some of the existing PRA tools including Focus Group Discussion (FGD) as one of the PRA tool and 3) practically illustrating how a FGD can be use to determine problems and causes of climate change as well as mitigation and adaptation strategies.

Methodology

Different literatures review and FGD were practiced to explain objectives of the study. About 20 post graduate students those coming from different part of the globe whose study under the faculty of Agriculture and Horticulture at Humboldt University of Berlin, Germany were considered as target people of the study. The details of the FGD conduction along with result is explained at the second part of the paper while first part of the paper revealed with PRA approaches.

Overview of PRA tools

There are several tools and techniques that belong to the PRA family. Some of these are briefly described along their main goal below:

Some existing PRA tools

Historical Timelines involves the analysis of past events such as conflicts, natural disasters (floods, droughts, cyclones etc.), changes in the natural, social, political or economic environment and the ways in which community members have dealt with them (Callens *et al.*, 1999). The goal of this tool is to understand the history of the

community and identify trends and their influences throughout history (SEPP, 2007). Village resource maps are a compilation of the perception of resources in a given community and are usually drawn by the community members on large pieces of paper or on the ground to indicate spatial representations of resources such as infrastructure, water sources, agricultural landscapes, agro-ecological zones, forest and grazing areas (AFN, 2002). Moreover, it helps to the researchers or policy makers to assess & evaluate the resources of the community (Carey and Etling, 1997).

Another important tool of PRA is seasonal calendar which is used to explore seasonal changes in a given community. Changes such as the distribution of rainfall patterns, income, agricultural and non-agricultural labour, food consumption, animal fodder, gender-specific workload and migration can be shown on such calendars (Chambers, 1994). The main objective of the seasonal calendar is to learn about changes in livelihoods over the year and to show food availability, gender-specific workload, water availability, credit availability throughout the year, as well as holidays available within the community. The use of open ended questions is important in obtaining more detailed information. Some key questions to ask the community could be: How does credit availability vary over the year? What are the busiest months of the year? How does rainfall vary over the year? (Sontheimer *et al.*, 1999).

Wealth ranking is a sensitive PRA tool aimed at investigating perceptions of wealth differences and inequalities in a community. It involves placing people on the different steps of the social ladder according to their own criteria, chiefly to discover which community members belong to the richest, middle-income and poorest categories (Lekshmi *et al.*, 2008). During the interviews, Callen *et al.* (1999) suggests the use of questions such as: What socio-economic groupings are there in a community and who belongs to what group? ; What are the local perceptions of wealth, well-being and inequality in the community? Questions such as these are aimed at understanding local indicators and criteria of well-being and wealth in a community. The responses got can also be used to address livelihood concerns for different wealth groups in the community especially the poor (Vietnam, 2003).

Transect Walks involve members of the outside investigating team (researchers and facilitators) walking through the community with local people to record significant social and physical features of the region (Maarten *et al.*, 2008). Observations and discussions involving asking open-ended questions and listening are carried

out, as different zones, soil types; land uses, vegetation, crops and livestock are identified. Problems as well as possible solutions are also sought as the different zones and resources are mapped and diagrammed (Chambers, 1994). Maarten *et al.* (2008) add that the use of transect walks helps researchers gain the confidence of the local people and can be used to identify circumstances under which climate change may have an impact on a given village. Diagrams are a pictorial representation of information, used to illustrate flows, causal relationships and other connections as well as the analysis of spatial data (Adepo, 2000). Examples are Venn diagrams, Flow diagrams, Transect diagrams, Causal-linkage diagrams and Systems diagrams. Conroy (2002) indicates that diagrams encourage participants to get involved in the research process and express the information in a way that is best understood by them, while at the same time openly discussing options of correcting and refining the information.

Schwedes and Werner (2010) describe matrix scoring and ranking as an exercise that involves placing something in order to determine what is important and what is less important or less appropriate, that is; different options or solutions are ranked according to criteria. A matrix is a dual entry network that can be applied to evaluate two sets of variables (Conroy, 2002). The major objective of this tool is to identify the common problems within the community, rank and score them in order of importance, then scrutinize them and brainstorm for possible solutions. Problem-Cause-Effect-Solution Trees (Problem Trees) involves collectively identifying, listing and prioritizing problems within a community, their causes and possible solutions. This tool helps recognize linkages between causes and effects of problems as well as their solutions. It can be used to plan activities within a given community, pertaining to issues such as health, nutrition, education and gender issues (SEPP, 2007). Interview such as semi-structured interviews, key informant interviews and expert interviews can be used with individuals, key informants, experts, interest groups or other small groups of villagers (Cavestro, 2003).

Focus Group Discussion (FGD)

Campbell (2008) defines a FGD as “a planned, facilitated discussion among a small group of stakeholders designed to obtain perceptions in a defined area of interest in a permissive, non threatening environment”. It is the method of rapid assessment and data gathering in which participants congregate to talk about the specific issues and concern based on a list of key themes drawn up by the researcher/facilitator (Kumar,

1987). The main objective of focus group discussion is to acquire knowledge regarding the particular issue. It can be used to collectively assemble and analyse information for many purposes such as the adoption of a particular innovation (Ndah *et al.*, 2011), needs assessment (Tipping, 1998), program evaluation (Packer *et al.*, 1994) etc. For conducting a focus group discussion, a facilitator and assistant to facilitator are needed. The facilitator leads the group discussion and encourages the participants. The assistant to the facilitator is to take notes, run the tape recorder, respond to the unexpected interruptions, and is always ready to follow the facilitator’s mode of action. Knowledgeable, pleasing personality, politeness, ability to speak local language, respect to local norms and behaviour, ethics, patience etc. are the main criteria of a good facilitator.

Exemplary application of a FGD in climate change

The main purpose of this issue was to practically demonstrate how a FGD as a PRA tool alongside others can be used to identify and analyse some of the adverse climate change problems, causes as well as some possible mitigation and adaptation strategies. The target group for this exercise was a group of students under the faculty of agriculture and horticulture at Humboldt University of Berlin. Therefore, represents the statements and conclusions arrived at by this group of students within a FGD session.

Specific objectives of the FGD exercise

This exercise was meant specifically to:

- 1) Understand the group’s perceptions of climate change by identifying and ranking some of the main climate change problems presently under debate.
- 2) Identify and understand the major cause or triggers of the identified problems
- 3) Identify and understand some of the possible mitigation and adaptation strategy to Climate change.

All these were meant to in effect expose the individual as well as groups perception of the present climate change issue under debate with the use of a FGD.

Organisation of the FGD

Participants included about 20 students from different cultural as well as disciplinary backgrounds. The purpose of choosing such a heterogeneous group for this purpose was meant to ideally bring to a common platform the differences in perceptions with regards to the present climate change issue. Two PRA-team members were in charge of the organisation and running of the exercise. While one was in charge of facilitating the discussion, one was taking

notes and assisting with the compilation of the results for the feedback session.

Guided questions and methods used

To effectively achieve the desired objectives, the focus group exercise was combined with other PRA tools such as “matrix scoring and ranking”. The key questions which guided the discussion with the corresponding steps or activities that were followed through in chronological order included:

- 1) According to you, what are the major climate change problems that people have faced during the 10 past years? (exercise 1)
- 2) In your view, what are the possible causes for the problems of climate change you have identified? (exercise 2)
- 3) According to you, what could be possible mitigation and adaptation strategies to the climate change problems you have identified? (exercise 3)

Activities in chronological order during the FGD (Exercise 1: Problems)

- Participants were asked to write down three problems each on cards which were collected and pasted on the pin board
- The pasted cards were then grouped with the help of participants according to categories and boldly printed numbers printed against each category (e.g. 1, 2, 3...)
- Each participant was then asked to individually rank these categories according to his/her perception by casting three votes for the three most important (severe) problems. This was by writing down three numbers selected from the represented (preferred) categories on cards.
- The votes were then counted and the three top ranked categories with the highest frequency of votes (selection) were then singled out as the most severe climate change problems perceived by the group.

The same exercise and activities was repeated for exercise 2 (causes) and exercise 3 (solutions) respectively to obtain results which answered the three questions and met the three objectives (see results).

Results and Discussion

After the three exercises, three major problems of climate change were identified, three main causes as well as three main mitigation and adaptation strategies as presented in Figures 1, 2 and 3.

Problems of climate change

Amongst the identified problems of climate change, those that fell under the category

“unpredictable weather events” were ranked the most severe with 50% severity rate. This was closely followed by the “water scarcity and desertification category” with 33% severity rate while the “Air and water pollution” category occupied the third position with 17% severity according to the perception of the group (Fig. 1). Similar finding has been explained by the several researchers and institutes.

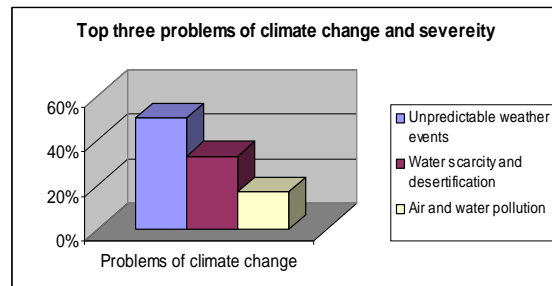


Fig.1. Top three problems of climate change according to the FGD

IPCC (2001) found the weather variability in the most places in the world due to climate change while Pickup (1998) described desertification is triggered by climate variability. Water scarcity is the result of climate change as explained by Morrison *et al.* (1998). Besides, Kinney (2008) and Delpla *et al.* (2009) revealed that air and water quality is affected by the climate change. So, the top three problems of climate change that have identified by this study are also justified by the others research. Therefore, policy makers, researchers, developers etc. might be considered while taking strategies for future context.

Causes of climate change

After categorising and ranking the identified possible causes of climate change by the group (exercise 2), the “human activities and use of fossil fuel category emerged as that with the most severe effect on climate (70% magnitude). Second on the list was the category “increasing temperatures” with 20% while “increase deforestation” occupied the third position with 10% (Fig. 2). Similar result has been found by the several researches while Hamilton and Stampone (2013) described that anthropogenic activities is the cause of climate change and fossil fuel is also the responsible for the same (IPCC, 2007). Moreover, emission of methane that plays an important role in global warming has been increased due to higher temperatures (Science News, 2010). Bloom *et al.* (2010) found about 7% methane has been increased during 2003-2007 due to warming of mid-latitude and wet arctic region. Now a days, higher temperatures are not consequence of climate change rather it can also worsen cause of it. Besides, Nobre *et al.* (2009) described that

deforestation is one of the cause of climate change. Now a days, deforestation, Green House Gas (GHG) emission are the crucial issue for altering the climate (Nordhaus, 1991). Responsible authority might have interests to give emphasize of these indentified problems that makes climate change adaptations effective.

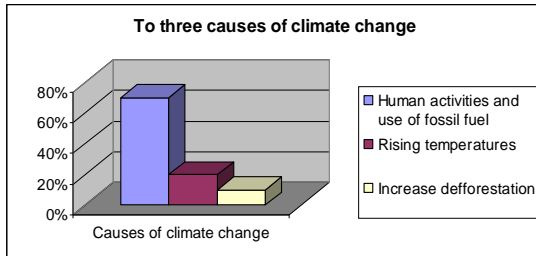


Fig. 2. Top three causes of climate change and magnitude

Mitigation and adaptation strategies

The last exercise (exercise 3), focused on analysing possible adaptation and mitigation strategies ended as well with three main categories: "Use of renewable energy plus a positive change in attitude and behaviour" towards the climate was identified as the category of solutions, which could have a significant positive effect on climate change (60% chance). This was followed by that which gave suggestions on favourable policies with regards to climate issues with a 30% chance (Fig. 3).

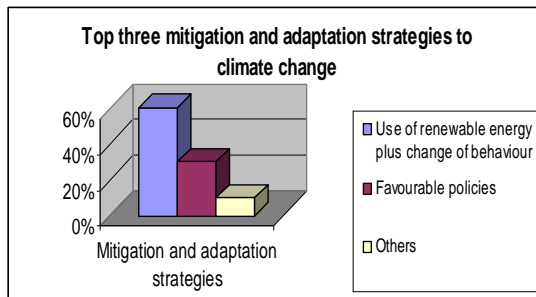


Fig. 2. Top three mitigation and adaptation strategies of climate change strategies

The last category which remained un-classified made mentioned of change in farming practices, and other suggestions which were deemed irrelevant and could have no influence on climate e.g. one suggestion was "to kill people", which we found to be out of context. Ziuku and Meyer (2012) explains that renewable energy reduces the 30% GHG by 2030 while McKibbin and Wilcoxon (2003) mentioned optimal policy can be mitigated as well as adaptation to climate change at low cost. They also specified the policies on land use change, water use property rights that migh have good effect on cliamte

change adaptations and mitigation as well. In the developing countries, agriculture sector is highly affected by climate change (FAO, 2009) resulting food shortage. Therefore, it is necessary to adapt with climate change quickly to produce more food by adopting different adaptations strategies such as increased use of irrigation, practicing crop diversification, integrated farming system, use of drought & salinity tolerant varieties etc (Uddin, 2012).

From the three categories of problems, causes and solutions, it could by concluded that unpredictable weather events as the most outstandingly identified category of climate change problems, is possibly caused by human activities especially through increase used of fossil fuels. The group then agreed that this problems could be possibly remedied to a certain extend if there is an increase search of alternative renewable energy sources followed by general awareness towards positively influencing peoples attitude and behaviour with regards to the present climate change issue.

Conclusion

In conclusion PRA is an ever changing trans-disciplinary process which uses adaptive methodology as and when problems arise. It is important to remember that in this research process one must always try to reduce the big questions to specific queries, immediate gratification is a rare event, local development is a two way street (feedback is critical) and that the behaviour and attitude of outsiders matter as much as the methods and their correct performance. One should be an active learner rather than claim to be an expert. Focus Group Discussion is one of the important PRA technique often used in combination with others to achieve desired goals. This paper tried to explain this technique, in combination with matrix scoring and ranking with a group of 20 students to identify causes of climate change as well as possible mitigation and adaptation strategies. The results concluded that "unpredictable weather events" was ranked as the present outstanding visible climate change problem caused by "human activities". However it was noted that if "alternative renewable energy sources are exploited, this could contribute to solving the present climate change problem. This finding might have the good reference for the policy makers in the same line not only for developing countries but also for developed countries.

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References

- Adepo, S. 2000. Training Manual on Participatory Rural Appraisal. Online available: <http://www.myfirecommunity.net/discussions/images/NPost8220Attach1.pdf> and accessed on 21st January 2013.
- AFN. 2002. Participatory Rural Appraisal for Community Forest Management: Tools and Techniques. Asia Forest Network, California USA. pp. 18-19.
- Alam, A. and Ishan, S. 2012. Role of Participatory Rural Appraisal in Community Development (A Case Study of Barani Area Development Project in Agriculture, Live Stock and Forestry Development in Kohat). *Int. J. Acad. Res. Busi. & Soc. Sci.* 2 (8): 25-38.
- Bloom, A.A., Palmer, I.P., Fraser, A. Reay, D.S. and Frankenberg, C. 2010. Large-Scale Controls of Methanogenesis Inferred from Methane and Gravity Spaceborne Data. *Science*. 327 (5963): 322. doi:10.1126/science.1175176
- Callens, K., Seiffert, B. and Sontheimer, S. 1999. The PRA Tool Box, Technical Backstopping to the Preparatory Phase of GCP/ETH/056/BEL. Online available: <http://www.fao.org/docrep/003/x5996e/x5996e06.htm#6.2.%20Modified%20PRA%20Tools> and accessed on 20th August, 2013.
- Campbell, R. 2008. Guide to Focus Group Discussion, micro report no. 138. USAID. p. 1.
- Carey, H.A. and Etling, A.W. 1997. Constructing and Conducting Rural Appraisal. *J. Int. Agric. Extn. Edn.* 4 (3): 27-37.
- Cavestro, L. 2003. PRA - Participatory Rural Appraisal Concepts Methodologies and Techniques. MS Thesis. University of Padova, Italy. pp. 16 -26.
- Chambers, R. 1992. Rural Appraisal: Rapid, Relaxed and Participatory. Discussion Paper #311, Institute of Development Studies, Sussex, UK. pp. 15-16.
- Chambers, R. 1994. The Origins and Practice of Participatory Rural Appraisal. *World Dev.* 22 (7): 953-969.
- Chambers, R. 1997. Whose Reality Counts? Putting the First Last. London: ITDG Publishing. pp. 157-158.
- Chambers, R. 2007. From PRA to PLA and Pluralism: Practice and Theory. Working Paper #286, Institute of Development Studies, University of Sussex, Sussex, UK. pp. 7-12.
- Conroy, C. 2002. PRA Tools used for Research into Common Pool Resources: Socio-economic Methodologies for Natural Resources Research, Best Practice Guidelines. Natural Resources Institute, University of Greenwich, UK. pp. 7-8.
- Delpa, I., Jung, A.V., Baures, E., Clement, O. and Thomas. 2009. Impacts of climate change on surface water quality in relation to drinking water production. *Env. Int.* 35: 1225–1233.
- FAO. 2009. Food Security and Agricultural Mitigation in Developing Countries: Options for Capturing Synergies. Rome: FAO. 11 p. Hamilton, L.C. and Stampone, M.D. 2013. Blowin' in the Wind: Short-Term Weather and Belief in Anthropogenic Climate Change. *Wea. Climate Soc.* 5: 112–119.
- IPCC. 2001. Impacts, Adaptation and Vulnerability. Third Assessment Report. Cambridge University Press, Cambridge, UK. 92 p.
- IPCC. 2007. Climate change 2007. Fourth Assessment Report. Cambridge University Press, Cambridge, UK. 134 p.
- Kinney, P.L. 2008. Climate change, Air Quality, and Human Health. *American J. Prev. Med.* 35 (5): 459-467.
- KKU. 1987. Rapid Rural Appraisal. Proceedings of the 1985 International Conference on Rapid Rural Appraisal, Rural Systems Research and Farming Systems Research Projects, University of Khon Kaen, Thailand. pp. 14-18.
- Kumar, K. 1987. Conducting focus group interviews in developing countries. AID Program Design and Evaluation Methodology Report No. 8. Washington, DC: USAID. pp. 3-5.
- Lekshmi, P.S.S., Venugopalan, R. and Padmini, K. 2008. Livelihood Analysis using Wealth Ranking Tool of PRA. *Indian Res. J. Extn. Edn.* 8 (2&3): 75-77.
- Maarten, K.A., Cannon, T. and Burton, I. 2008. Community Level Adaptation to Climate Change: The Potential Role of Participatory Community Risk Assessment. *Global Env. Change.* 18: 165-179.
- McKibbin, W.J. and Wilcoxon, P.J. 2003. Climate Policy and Uncertainty: The Roles of Adaptation versus Mitigation. Online available: http://een.anu.edu.au/download_files/een0306.pdf and accessed on 10th October, 2013.
- Morrison, J., Morikawa, M., Murphy, M. and Schulte, P. 2009. Water Scarcity & climate change: Growing Risks for Businesses & Investors. A ceres report. Pacific Institute. Oakland. Online available: http://www.pacinst.org/wp-content/uploads/2013/02/full_report30.pdf and accessed on 20th September, 2013.

- Ndah, H.T., Knierim, A. and Ndambi, O.A. 2011. Fish Pond Aquaculture in Cameroon: A Field Survey of Determinants for Farmers' Adoption Behavior. *J. Agril. Edn. & Extn.* 17 (4): 309-323.
- Nobre, Paulo, Malagutti, M., Domingos, F.U., Roberto A.F., De Almeida. and Giarolla, E. 2009. Amazon Deforestation and Climate Change in a Coupled Model Simulation. *J. Climate.* 22: 5686–5697.
- Nordhaus, W.D. 1991. Economic approaches to greenhouse warming. pp. 33-68. *In: Global warming: Economic policy approaches*, ed. R.D. Dornbush and J.M. Poterba, Cambridge, MA: MIT Press.
- Packer, T., Race, E.K. and Hotch, F.D. 1994. Focus groups: a tool for consumer-based program evaluation in rehabilitation agency settings. *J. Rehabil.* 60 (3):30-33.
- Pickup, G. 1998. Desertification and climate change—the Australian perspective. *Climate Res.* 11: 51–63.
- Schwedes, S. and Werner, W. 2010. Manual for participatory land use planning facilitators. Ministry of Lands and Settlement and German Technical Cooperation (GTZ). pp. 139-141.
- Science News. 2010. Higher Temperatures Can Worsen Climate Change, Methane Measurements from Space Revealed. Online available: <http://www.sciencedaily.com/releases/2010/01/100115204416.htm> and accessed on 10th September, 2013.
- SEPP. 2007. Socio-Economic Planning Process. Participatory Rural Appraisal Manual. Quang Ngai Province, Vietnam. Online available: <http://www.rdsikkim.org/Files/3%20PRA%20Facilitators%20Manual.pdf> and accessed on 19th September, 2013.
- Sontheimer, S., Callens, K. and Seiffert, B. 1999. Conducting a PRA Training and Modifying PRA Tools to Your Needs. An Example from a Participatory Household Food Security and Nutrition Project in Ethiopia. Food and Agricultural Organization of the United Nation. Online available: http://www.fao.org/Participation/english_web_new/content_en/Sector_doc/PRA_nutrition.pdf and accessed on 18th September, 2013.
- Tipping, J. 1998. Focus groups: A method of Needs Assessment. *J. Cont. Edu. Health Prof.* 18: 150–154. Online available: <http://www.iisd.org/casl/caslguides/rapidruralappraisal.htm> and accessed on 18th September, 2013.
- Uddin, M.N. 2012. An Analysis of Farmers' Perception and Adaptation Strategies of Climate Change in Bangladesh. MS Thesis. Humboldt University of Berlin, Germany. pp. 46-49.
- Vietnam, H. 2003. PRA tools for identifying activities for the mid-term and yearly socio-economic Village Development Plan (VDP). Extension and Training Support Project for Forestry and Agriculture in the Uplands. pp. 25-26.
- Weber, L. and Ison, R. 1995. Participatory Rural Appraisal design: Conceptual and process issues. *Agril. Sysm.* 47: 107–31.
- World Bank. 1995. The Participation Sourcebook, Washington DC, World Bank. p. 175.
- Ziuku, S. and Meyer, E.L. 2012. Mitigating climate change through renewable energy and energy efficiency in the residential sector in South Africa. *Int. J. Renewable Energy Tech. Res.* 2 (1): 33 – 43.