1 Improvement on Environment Sanitation of Newar (Ethnic) Community using Dry (Ecological Sanitation) toilet

2 A Case Study of Peri-Urban Community in and out of Kathmandu valley

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Abstract: *Newars, ethnic community of Kathmandu valley, have a traditional practice of using urine and human faeces as manure in the form of "nauga" and "saaga" but with change in time period and occupation, these practices have been less visible at present. With modification, ecological sanitation (Ecosan) toilets were introduced in Peri-Urban farmers' community of Newar and successfully adopted by the community. Till now 748 ecosan toilets have been constructed in this community. The aim of the study is to identify present situation of Ecosan toilet and its impact on environment and their livelihood. Most of toilets were found in use and managed mainly by old generation. The environmental sanitation were found much improved .The agriculture production was not so different in compare to the use of chemical fertilizers but quality of food were found much better as expressed by users. More research in utilization of urine is found necessary to attract farmers of Newar & non-Newar community. Modification and promotion of Ecosan toilets among younger generation in urban area could be sustainable option to reduce environmental pollution and to mitigate growing scarcity of water.*

Keywords *Ecological sanitation, Ecosan toilet (Dry & Wet), Newar*

Introduction Newar, one of the most ancient inhabitants (since 6th century B.C.) of Kathmandu valley (anciently called "Nepal valley") are rich in indigenous skills and technologies that hold high social integration, good cultural and religious norms with their own traditional speaking language called "Nepal Bhasha", diversified occupational conditions based on caste and advanced system of urban development with its own traditional system of waste management known as "n*auga*" and "*saaga*". *Nauga,* literally means ash pit, was constructed under the ground floor staircase for urinating and then adding ash, straw and rice-husk to produce compost. *Saaga* literally means compost pit made near the courtyard where especially organic wastes from kitchen were accumulated and composted. Traditionally, a cleaners' caste called "pode" was in charge of collecting human excreta from pit latrines to sell it further to farmers.

Along with the increasing urbanization, indigenous knowledge of composting technology have been disappearing and the few remaining examples regarding

these practices are now unhygienic and in poor condition.

In Nepal, out of 27 million populations at present, only 46% have access to latrines while the rest of the people practice open-air defecation. Annually some 13000 children under five years of age die of diarrheal diseases due to poor hygiene and sanitation. Nepal continues to bear the loss of some 10 billion rupees each year in terms of health expenses, loss of productivity and adverse effects in tourism due to this situation. Nepal's national goal is to provide basic sanitation facilities to all by 2017. However, it has to ensure 53% toilet coverage by 2015 to achieve the sanitation MDG (Nepal

Country Plan of IYS, 2008). Thus, improvement of hygiene and sustainable environment sanitation becomes one of main challenges for Nepal.

In 2002, some professional experts from ENPHO, D-Net and DWSS came up with new thought in adopting the Newar indigenous technology in modified form and initiated planning and construction of the dry toilet referring ecological sanitation at the peri-urban community of Lalitpur i.e. Siddhipur and Khokana VDCs. Till now 1141 Ecosan toilets have been constructed in Nepal (DWSS, ENPHO & SEAM-N, 2009). In general, two types of these toilets have been introduced in Nepal: urine-diverting dry toilets and urine-diverting wet toilets. Most of the toilets constructed so far are dry toilets and 66% of all Ecosan toilets constructed so far are located in Kathmandu valley (DWSS 2009). Thus, this is a case study done focusing mainly on Newar community of Kathmandu valley with aim of identifying present situation of Ecosan toilets and their impacts on environment and their livelihood.

Methodology This is the case study carried out on present situation and impact of Ecosan toilet on livelihood of Newar community of peri-urban area of Kathmandu valley. Since Newar especially farmers' community has indigenous technology of using urine and human faeces as fertilizers, the study try to reveal currently adopted practices of Ecosan toilet and impact on their livelihood. The researcher visited various places like *Siddhipur, Lubhu, Chapagaun, Thecho, Khokana & Tokha* in Kathmandu valley where most of Dry Ecosan toilet were constructed and carried out field observation, direct interviews with users and family members. The researcher carried out random sampling taking 10% of samples from total number of Ecosan toilet constructed in Kathmandu valley. The researcher also carried out study outside the Kathmandu valley in Eastern Terai regions like *Itahari* Municipality, *Khanar* and *Hattimuda* VDCs to observe present practices and condition of Wet Ecosan toilets. The secondary information was collected from various government and non-government organization of Nepal.

Result and Discussion Socio-culturally, Newars were familiar with recycling of urine and faeces as fertilizer since ancient time, it did not take so much time to adopt this Ecosan toilet. The toilet was easily adopted by old generation though it took some times for younger generation. About 98% of the Dry Ecosan toilets in Newar community were found in use, while the rest of others were demolished and not in use due to migration and construction of new houses after family fragmentation. In some places like *Tokha*, such toilets were not found in hygienic condition due to scarcity of water in the village.

Different structures of double vault dry Eco-san toilet were found in the community. Most of the toilets were made from brick and cement upto superstructure and few of them were brick and cement upto plinth and bamboo in superstructure. There were various types of pan sets. The average cost of the Dry Ecosan toilet was about NRs. 16,000 (152 €[1]) for complete construction. Only the labor cost of about NRs. 1000 (9.5 Euro) was the contribution part of the community. At present it would cost about NRs 25,000/- (238 €) and for its training NRs. 600/- (5.7€) per person. The construction cost can vary from place to place depending upon design adopted, material used and market price fluctuation.

Almost farmers were of the opinion that there was increase in agriculture production after using urine and human excreta, however, they have no experimental data as evidence. They reported that there was significant increment in quality and productivity of vegetables like beans, brinjal, chilly, potato etc. and crops like rice, maize. Especially, potato did not rotten easily as it does while using

chemical fertilizers. They admitted that it reduced about 50% costs of chemical fertilizers and pesticides after using it. Some of them were found using urine as a pesticides to the vegetables as well as fruit trees. With their practical experience they found soil texture and soil fertility much improving than before. However, during crop season, these fertilizers were even not enough for them, they have to depend upon chemical fertilizer but lesser in amount. Before intervention of Ecosan toilet and sanitation awareness, Siddhipur usually nickname as “A town of Faeces". Similarly, Newar's older town like *Tokha, Khokana, Thecho* and *Pyangaun* were also in poor environmental and sanitation condition. Now, after massive awareness raising among community especially by female social mobilizer's of Siddhipur and after adoption of Ecosan toilet, the old city is now very clean which was a major achievement from environment point of view that community expressed proudly to every visitor.

A Case Story: Black Gold for Jivan and Krishna Devi Maharjan, Siddhipur

Mr. Jivan, who is living happily with his better-half Krishna & 2 children, is a farmer by profession. He has cultivated various kinds of vegetables on 0.23 hectors of land and commercially selling them in local market. He is very proud that his vegetables are sold so quickly in the market and earn NRs. 45000/- (428.6 €) per month. He grows different types of vegetables such as chilly, brinjal, beans, lettuce, cabbage, maize, carrot, radish, cauliflower etc. He uses urine directly to the crop and sometimes uses with slurry of bio-gas. He harvested compost from Ecosan toilet at every 3 months and mixed it with partially composted cow dung and decomposed straw etc. He confidently said that production is double than before. Another interesting thing is that he used urine as pesticides and sprayed it on the leaves of fruit trees to protect it. He and his family are very happy with this toilet and its end products like compost and urine becomes black gold for them.

Outside the Kathmandu valley in Eastern Terai region of Nepal, the authors visited few Wet Ecosan toilets that are constructed in Itahari municipality, Khanar and Hattimuda VDCs with SEAM-N support. About 70% of users hesitate to use urine and they just discharge it in the open drainage and field and also toilets are not properly maintained. However, exceptionally some of users like Ms *Binita Bista, Itahari* and *Mr. Chandra Lal Chaudhary, Khanar* are good example, among others, who without hesitation use urine for organic vegetable farming such as *pumpkin, gourd, beans, lady’s fingers, chilly, lettuce, etc. Mr. Chaudhary* earned NRs.12000/- (114€) per month by selling vegetables in market. They do not use any chemical fertilizers.

Conclusions Traditional system like "*Khichamuga "*(open public defecation place), which usually remained in poor and unhygienic condition, is now almost eradicated in urban & peri-urban community of Newar. However, there were still few remaining in community like *Siddhipur & Chapagaun.* Some of "nauga" and " saaga" were now rarely found . Dry Ecosan toilets though very negligible in compare to other general toilets, were steadily increasing in practices over the past six years in Nepal. Dry Ecosan toilet was successfully launched in peri-urban community of Kathmandu valley in Newar community and they were now started to introduce in many areas like *Parsa, Gorkha, Chitwan, Sunsari & Morang* districts outside the Kathmandu valley in non-Newar community as well. Environmental sanitation and hygienic situation in community like *Siddhipur, Tokha, Khokana* and *Thecho* has been improved. Some of Ecosan toilet users are practicing organic vegetable farming as an income generation activity.

Since beginning, the design of Dry Ecosan toilets were found modified many times to make more user friendly however, there is still hesitation for new generation in managing and operation of urine storage and compost from human faeces . Difficulties in transporting urine far in the field were another challenge for them. Many Newars in Siddhipur, due to lack of space in courtyard, are unable to construct such toilets though many showed willingness. Rapid urbanization process that reduced agriculture field and change in occupation among new generation of farmers in *Thecho, Khokana* and *Tokha* made the community less interested towards this technology. Thus

modification of design with user's friendly way for new generation would be very essential in order to promote these toilets in urban area. The development of micro entrepreneur in urine recycling business could be one of good option too. Similarly in rural areas both in Terai and hills, especially among farmers, this type of toilet could be promoted for sustainable organic farming.

Some of recent good policies formulated by Ministry of Local Development, GON has committed to use 20% of water sector budget to sanitation promotion. Also, Ministry of Finance has given mandate to Village Development Committee for using 25% of their funds for achieving open defecation free zone, which could help in improving total environmental sanitation in Nepal. Still, we need adequate policy consistency and relevant program support in this regard.

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