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| Research Subject | Application of a simple ceramic filter (SCF) to water treatment processes |
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Water is life and essential for all socio-economic development and for maintaining healthy ecosystems. Although water covers 70% of our planet, and it is easy to think that it will always be plentiful, only 2.5-3% of the world's water is fresh. Even then, just 1% of freshwater is easily accessible for our use. But this small fraction is again becoming more lessened due to continue population growth and urbanization, rapid industrialization, climate change and contamination by human activities. Now the world is facing water shortage problem. And the main challenge of the 21$^{st}$ century is to overcome this problem by supplying fresh water and treating wastewater to reuse as well. As the countermeasure of the water problem the conventional as well as advanced water treatment technologies have been designed and proposed.

But still now the advanced water treatment technologies are limited to developed countries. Advanced treatment technologies have not expanded to developing countries due to high cost and difficulties of installation, operation and maintenance. To overcome these challenges, interest of developing simple, innovative, inexpensive and effective techniques is increasing as in developing countries the supply of clean water and the treatment of water for reuse purpose is promising day by day.

From the past few decades the membrane technology is regarded as a key element of advanced treatment process for its extraordinary solid-liquid separation capacity. But the membrane technology is still costly for its wide application in developing countries. The membrane technology can only compete with other low cost separation system e.g. ceramic filtration. The ceramic filter made with locally available and cheap materials would be a good option for water treatment process in developing countries.

This research examined the applicability of a low cost and simple ceramic filter (SCF) to water treatment sectors focusing the situation of developing countries. The SCF used in this study has been manufactured by using locally available and cheap materials. The ingredients of the SCF are soil (collected from a local brickfield in Khulna city, south-western part of Bangladesh) and rice bran. The dried soil (sieved by 0.5 mm mesh) and the dried rice bran (sieved by 1 mm mesh) have been mixed homogeneously with a ratio of 80% of soil and 20% of rice bran on a weight basis. Appropriate amount of water has been added with the mixture to make dough for making filter. A hollow cylindrical shape of the filter has been made with the dough by using a dice of wood and PVC pipe. After sun dried the filter has been burnt at 900$^{o}$C in a small scale local kiln in the same region. The pore size of the filter is assumed 1-5 μm and the manufacturing cost for one ceramic filter is estimated to be US$0.2-0.3.

The applicability of the SCF to water treatment processer has been studied as following frame structure.

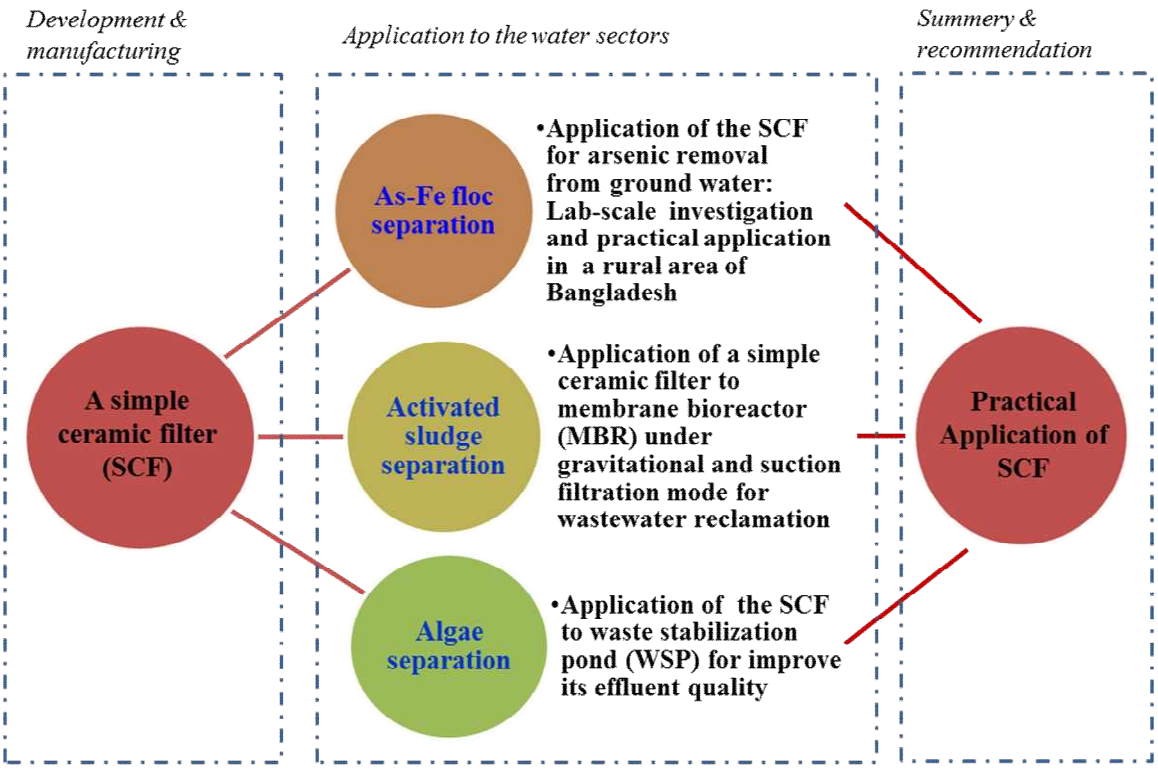


Figure: Frame of the study