Vermicomposting with local earthworms

Earthworms and their agriculture friendly activities have been reported from ancient time. Earthworms decompose organic matter quickly, increase nitrification, turnover soil etc., which increase plant productivity, soil fertility and enhance the growth of micro-organisms. Vermicomposting is a process of converting organic waste material through earthworm consumption into high quality of organic compost. Vermicompost contains water-soluble nutrients and is an excellent nutrient-rich organic fertilizer, soil conditioner and fish-feed. It is good for farming and small scale sustainable organic farming as well. Surface dwelling or non-borrowing earthworms are suitable for vermicomposting. These earthworms do not need soil for survival and live and they flourish in organic waste particularly mixed with cattle dung. Most soils in agricultural areas in Bangladesh have a low organic matter due to mainly lack of organic recycling and intensive chemical farming. In agricultural plots the soils are becoming barren day by day and deficiency of different nutrients is appeared one by one. So some government and non-government organizations are trying to promote vermicompost with technical and other supports. Mainly two exotic species *Eisenia fetida* and *Eudrilus eugeniae* are widely promoted and used for vermicomposting in Bangladesh. It is general understanding that local earthworms are unable to produce vermicompost. But, some experts and ecologists suggested that the search of suitable local species of earthworms for vermicomposting which are better adapted under local climate and field conditions. Besides, money is also required to buy exotic earthworms. Large-scale import of exotic varieties of earthworms and their culture for vermicompositng might be a threat for the native fauna of earthworms and involvement of risk of introduction of un-wanted species of micro and other organisms which may become hazardous in local environment. RIB's Agro-ecology Manual also emphasizes the use of native earthworms for vermicomposting. The manual has also focused to facilitate natural breeding and rearing native earthworm and to abstain from any activity which may cause harm to those earthworms in agricultural plots, so that the whole plot will be converted to vermicomposting area.



Photo: Local earthworms at Bogura

The RIB-RLS project's associated farmers identified the worsening fertility status of soils as one of the major agricultural challenges. They discussed the way-outs and the techniques of agro-ecological farming in regular PAR (Participatory Action Research) group meetings. Besides,

capacity building activities on different composting techniques including vermicomposting and sustainable soil management systems were organized and relevant publications were prepared by RIB to assist the farmers for conducting agro-ecology. Dr. Ranjit Sen (Senior Scientific Officer, Soil Science Division, Bangladesh Agricultural Research Institute) discussed the issues and preparation process with selected farmers during the Residential School on Agro-ecology in 2018. Later the learning was shared with all the associated farmers during Local Schools.

Though the exotic varieties of earthworms are quite available and can be bought from different sources, but farmers have to intensively search the native varieties in their locality and examine the capability of selected variety of earthworm. RIB organized an Exchange Visit at Manikganj to exchange agro-ecological knowledge and experiences within farmers of different areas in 2019. During visit, the participated project farmers observed the preparation of vermicomposting with local earthworms. Md. Ibrahim, a senior farmer and Kabiraj (experts in medicinal plants and folk medication) of Noyabari village of Manikganj, showed the local variety earthworm which he selected for vermicomposting and their natural and artificial habitat. They are leaf-litter or compost-dwelling worms and can be found at the soil-litter interface.



Photo: Local non-borrowing earthworms can be found at decomposing banana tree stalk

These initiatives encouraged the project farmers to produce vermicompost. By March 2020, fifty four farmers cultured vermicompost in their households. Thirty three farmers of them cultured vermicompost with local earthworms. They searched their neighbourhood, selected the particular variety and used local earthworms.

The farmers used round concrete container (chari/ ring) for producing vermicompost. They filled the container with cow dung and chopped organic waste and kept the container under shade. After 7-8 days they added earthworms. While the first lot of vermicompost was ready within 60-70 days, the duration of next lots gradually decreased to 30-40 days. Md. Taherul, farmer of Majhbari village of Bogura district, got 35 kilograms of vermicompost from one chari. Ansar Ali, farmer of Noyapara village of same district, preparing vermicompost simultaneously with non-native and native earthworms and planning to shift to native earthworms only.



Photo: Md. Taherul and his vermicompost culture container

Applying vermicompost the producer farmers were more than pleased with the results. It helped to build their confidence to shift agro-ecology from chemical dependent farming practices. The results also attracted the attention of other fellow farmers. The producer farmers are planning to increase the number of container and trying to keep suitable environment for earthworms in their agricultural plots. Other famers of their areas have also shown their interest to follow in their footsteps.



Photo: Prepared vermicompost in concrete container (chari)