

ANOR Newsletter

A mini-digester network:

-----A strategy for manure disposal

Recently, animal husbandry in China has been developing very rapidly and contributed greatly to the improvement of life standard of Chinese people. The distribution of the farms has a distinguish tendency of intensification and centralization around large cities because of the economic concern. The concomitant production of manure once caused a great environmental issue in the corresponding areas. Presently, the disposal has to undergo a standard treatment technology such as anaerobic digestion, A/O process, to meet the rigid national standard for the discharge of the wastewater and solid wastes. However, a way of animal raising, typically pigs, which probably occurs in other developing countries, has a difficulty in waste disposal.

In many areas, the animal farms are not operated in a large scale; farms each having several ten heads of animals are quite popular, and distributed scatteredly in land with a small area. Two decades ago, manure, in this case, was used as an important nutrient resource and played a crucial role in better cropping. However, the importance of manure as a nutrient resource has declined with the reduction of fertilizer cost and the increase of labor and transport cost, and therefore, farmers are reluctant to use manure as “organic fertilizer”. Furthermore, the large quantity of manure produced, due to the increase of animals in number, in a relative small area exceeds the loading capacity of the land around the farms. On the other hand, it is

obvious that farmers are not able to establish a standard manure treatment plant individually because of the high cost. Of the limited technologies available for manure treatment, anaerobic digestion seems to be a proper way for manure treatment, which supplies farmers with biogas for energy and residues for nutrient purpose with low operation cost. However, the collection facility for manure is also prohibitively expensive for the farmers. Each farm can only build a digester small in scale. This small-sized anaerobic digester was widely adopted in China in 70s and proved unsuccessful in many places. The main problems it encountered were:

- relatively high cost in that time;
- poor liability in biogas production.

Now, farmers do not have an economic problem in building the small-sized digester as shown in Fig 1; but the liability of biogas production hampered yet the wide acceptance of the way of manure treatment. An aerobic digestion network, which is indicated schematically in Fig 2, is established by connecting these “mini-digesters” with biogas pipe system, and proved very successful in biogas supply. The biogas produced is “buffered” by the pipe system and thus an individual biogas consumer uses the biogas that probably comes from all the nearby “min-digester”, avoiding the temporary biogas shortage. Experience shows a stable supply of biogas in four seasons. The liquid manure following digestion can be used for fertilization purpose since the most of the

carbonaceous materials have been removed. especially for product quality.
 Field experiment shows that this kind of nutrient resource is better for cropping, (March, from Zhejiang University, China)



Fig 1. Mini-anaerobic digester.

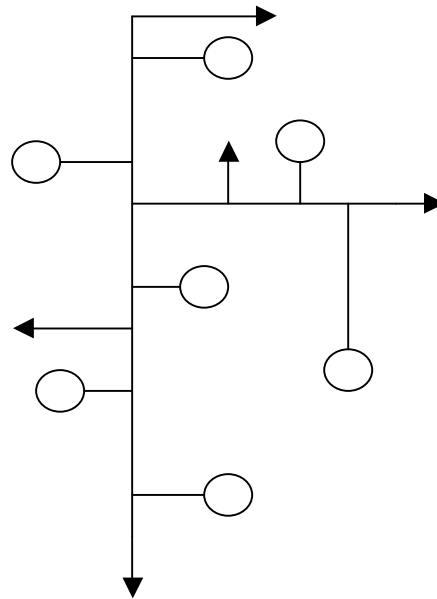


Fig 2. A mini-digester network.

- : Pipe system;
- ▶ : Biogas supply to farmers;
- : An individual mini-digester.