

Country Paper on Safe Use of Wastewater in Agriculture

1. Water availability and use

The prime source of water is the precipitation of rain. There are three available water sources which are as follows.

- (a) Surface Water**
- (b) Ground Water or Underground Water**
- (c) Rain or Snow**

These water sources are originated from the precipitate according to the water circulation. The water that some precipitates directly reach to the natural or artificial water harvesting pond, lake, impounding reservoirs, dam streams, river and sea, and some runoffs flow into the those water harvesters, is called the Surface Water. The some of runoffs that infiltrate into ground, is called Ground water. The rain water is directly received from the precipitate. In cold countries, snow is the important water source for human beings. The following water usage patterns is very common in Myanmar:

- (a) Domestic use –Bathing, Washing, Flushing, Cooking, Drinking**
- (b) Garden watering use**
- (c) Fire fighting**
- (d) Industrial use**
- (e) Commercial use**
- (f) Agricultural use**
- (g) Unaccountable or losses**

The Engineering Department (Water Supply and Sanitation) under Yangon City Development Committee (YCDC) of Yangon Regional Government is solely responsible for the provision of the domestic water for Yangonists. YCDC is providing the water to the downtown (6) townships, townships near-by downtown and some sub-urbans from water sources of tube wells, Inya and Kandawgyi lakes, Gyobyu , Lwaygar and Phugyi impounding reservoirs and Ngamoeyeik dam. The unserved areas by YCDC is drilling the own tube well individually in their compound. Some are buying the water from water vendors. Similarly , for Mandalay of third capital city, MCDC has being made same as YCDC for the provision of the domestic water for Mandalay people, from water sources of tube wells, Nandawshte lake, Yeni stream, Kindar and Sedawgyi dams.

In Nay Pyi Taw of the first capital city of Myanmar, Nay Pyi Taw Development Committee (NDC) is dully responsible for the provision of the domestic water and commercial complexes. The water from the water sources of tube wells, Mingalar lake and impounding reservoirs and Ngalite dam are distributed

The plenty of the water usage patterns in Myanmar will demand the rain water recharge schemes all over the country in the future of next generation due to overpumping of ground water and surface water and drought

of Climate Change, finally water scarcity . The fluctuation of water is gradually high at the time between 6:00 am to 12:00 am. The water usage is lowest at time between 1:00 pm to 4:00 pm. Again, the fluctuation of water is high at the time between 4:00 pm to 9:00 pm.

2. Wastewater production and treatment

The wastewater including sewage from above-mentioned water uses are generated as domestic, industrial and agricultural wastewaters which should be discharged into the already-managed treatment plants before final disposing respectively ,for example: domestic wastewater into the municipal open drains and pipe system in municipality areas or/and common effluent treatment plant. In the out of municipal areas, the individual household is to manage their wastewater as per directions without being affected the health status of people of Ministry of Health, ; specially for sub-urbans and rural areas.

The Engineering Department (Water Supply and Sanitation) under Yangon City Development Committee (YCDC) of Yangon Regional Government is solely responsible for the systematic disposal of the municipal wastewater of Yangon people including wastewater production and treatment. Similarly, the Engineering Department (Water Supply and Sanitation) under Nay Pyi Taw Development Committee (NDC) of Union Government is fully taking care of the systematic disposal of the municipal wastewater of people resided in the Union area. including wastewater production and treatment. The Engineering Department (Water Supply and Sanitation) under the Mandalay City Development Committee (MCDC) of the Mandalay Regional Government is solely responsible for the systematic disposal of the municipal wastewater of Mandalay people including wastewater production and treatment. For industrial zones, the industrial zone supervision committee of third capital city Mandalay and MDCD is jointly responsible for the systematic disposal and treatment of the industrial wastewater. The construction of wastewater treatment plants for the municipality and industries has been making under arrangements of MDCD and the Mandalay Regional government.

YCDC has already constructed the activated sludge wastewater treatment plant capable of (30)MGD. At present, the generation of wastewater treatment in Yangon is (3) MGD. The activated sludge wastewater treatment technology is the secondary method out of wastewater treatment technologies. This plant had been constructed since 2003 and in 2006, plant was commissioning into services. The minor maintenance work of plant has oftenly been carrying out and it is fully functioning now. Owing to this central common treatment plant for downtown (6) townships only, expanded common treatment plants construction for people residing in peri urbans are fundamentally required. So, YCDC has formulated and drawn the '(5) years Master plans on sanitation project including new settlement areas' to construct the common treatment plants in peri-urban

and new settlement areas. Moreover, generation renovation and maintenance works such as replacing the old pipes, chambers and manholes with new ones, desludging, lifting of manholes, substituting the old equipments and apparatus of Shone ejectors with new ones including change of driven mechanical to electrical system and major repair work on Main air pumping station have been urgently carried out because of the growing foreign visitors to the country from day to day. In line with the increasing population, development tasks, infrastructure relating to social, business, education and living standard and life style, and others and according to the field surveys including preliminary survey to able to carry out sanitation activities,(4) categories of land and site for the construction of wastewater treatment plants are as follows:

Priority rank	site location	proposed duration (year-wise)
1.	Thanlyseson □ Botahtaung Township	2003-2005(completed)
2.	Ahlone forest compound □ Ahlone Township	2015-2020
3.	Land site near by Padaukchaung □ Hlaing Township	2025-2030
4.	Land site near by Thitponseik □ North Okkalapa Township	2035-2040

As of first priority rank, the Wastewater Treatment Plant was constructed at Thanlyseson of Batahtaung Township in 2003 and since 2006, wastewater treatment works had carried out. It has a treating capacity of roundabout (3.25) Million Gallons wastewater generated not only from (6) Yangon downtown townships but also from individual sewage tank.

The Nay Pyi Taw situated the Union governemnt'offices was officially founded by the old government as a first capital city of the Myanmar since 2005 in the middle part of Myanmar. It has the (3) old townships and (5) new townships, all together (8) townships. In line with the well-established city, all infra-structures are completely installed at the government-owned office and apartment buildings situated in the new five townships of Nay Pyi Taw. The sanitation work, one of the infra-structures, have already been installed through the septic tanks having the (10) years design life for each government offices. And for the government apartment buildings lived by various staffs, the water carriage sewage disposal system have already been installed. Within the design year, only minor problems are happened such the blockage at squatting toilet pens and pipe brokening. For (3) old townships, individual household is to manage their wastewater (sewage) as per directions without being affected the health status of people of Ministry of Health, ; specially for sub-urbans and rural areas. For the disposal of industrial wastewater produced from industrial estate, the water carriage sewage system through the large septic tanks with (10) to (20) design years have been constructed by every industry with coordination, cooperation and permission of Engineering Department (Water

Supply and Sanitation) of NDC and other Ministries concerned. The reuse and recycle of municipal wastewater for watering to crop production is not applied. The water supply for the agricultural activities is depending on pumping water from reservoirs and dams. The volume of wastewater generated by domestic, municipal, and industrial sectors is not available.

3. Wastewater use and disposal

The wastewater reuse and recycle is well known in the world. The technical training on ecological sanitation is very famous in east and west Asia. The technical experts from the Ministry of Health and the City Development Committees of Myanmar were trained in Nepal. In the ecological sanitation technology, ecosan latrine is constructed and used for bio-fertilizer through the composting the human excreta and the urine is for watering purpose to plantation by means of separate disposal of human excreta and urine. This technology is very fruitful for the objective of water conservation, environment clean and green and sustainable development of ecosystem. But, the application of this type of technology is not yet in Myanmar because of political commitment of the government and traditional culture, religion and other norms.

The wastewater use is depending on the type and efficiency of wastewater treatment technology used like that primary, secondary and tertiary. Upon the characteristic of wastewater generated, the required efficiency of the treated wastewater and many factors, wastewater reuse could be done for purpose of wastewater irrigation of paddy crop and vegetation and the industrial wastewater reuse for individual process of commodity production (depending on required quality of each production process). But, the arrangements for the wastewater reuse and use have been making in the near future. The disposal methods have been mentioned in the above. In the law and regulation concerning with the fly-proof latrine construction and utilization affected in Myanmar, every household must construct and utilize the fly-proof latrine at least one for the targeting of preventing of water and soil pollution, for elimination of water-borne and sanitation-related disease, healthy life span and high fitness of Myanmar people and fulfillment of MDG goal.

The Ministry of Agriculture and Irrigation is solely responsible for food sufficiency and security for the whole country. The high yield crop, especially; a variety of the paddy seeds are capable to fulfill to the objectives of the Ministry of Agriculture and Irrigation.

The irrigated cultivation system is prevalent for high yield crop. In so doing, dam construction at the network scale is essential for the development of the irrigated cultivation system. The following irrigation figures are:

<u>Type</u>	<u>Number</u>
Dam construction	371
River water pumping	327
Underground water	8,279
Total irrigated area percentage	17.10%

4.Policies and institutional set-up for wastewater management

The avoiding and restrictions formulated on direct disposing without treatment of wastewater into the receiving water bodies is the policy for the wastewater management for objectives of prevention of water, soil and air pollution and for elimination of water-borne and sanitation-related disease from Myanmar environment, for assisting the elimination of water-borne and sanitation-related disease in the World. This is mentioned and enacted in the law of Communicable diseases prevention (1996) of Myanmar.

The detailed objectives

- To uplift the health status of the people.
- To make communicable diseases no longer public health problems, aiming towards total eradication or elimination and also to reduce the magnitude of other health problems.
- To foresee emerging diseases and potential health problems and make necessary arrangement of the control regarding to different pollution
- To develop the solid and liquid waste management system following international codes of practice
- To conserve environment through enabling the free of water pollution, soil pollution

National Health Policy

The National Health was developed with initiation and guidance of the National Health Committee, starting in 1993. The National Health Policy has placed the Health For All goal as a prime objective using Primary Health Care approach. The National Health Policy is designated as follows:

1	To raise level of health of the country and promote the physical and mental well-being of the people with the objective of achieving "Health for all" goal, using primary health care approach.
2	To follows the guidelines of population policy formulated in the country.
3	To produce sufficient as well as efficient human resources for health locally in the context of broad frame work of long term health development plan.
4	To strictly abide by the rules and regulations mentioned in the drug laws and by-laws which are promulgated in the country.
5	To augment the role of the co-operative, joint ventures, private sectors and non-government organizations in delivering of health care in view of the changing economic system

6	To explore and develop alternative health care financing system.
7	To implement health activities in close collaboration and also in an integrated manner with related ministries.
8	To promulgate new rules and regulations in accord with the prevailing health and health related conditions as and when necessary.
9	<i>To intensify and expand environmental health activities including prevention and control of air and water pollution.</i>
10	To promote national physical fitness through the expansion of sports and physical education activities by encouraging community participation, supporting outstanding athletes and reviving traditional sports.
11	To encourage conduct of medical research activities not only on prevailing health problems but also giving due attention in conducting health system research.
12	To expand the health service activities not only to rural but also to border areas to meet overall health needs of the country.
13	To foresee any emerging health problem that poses a threat to the health and well-being of the people of Myanmar, so that preventive and curative measures can be initiated.
14	To reinforce the services and research activities of indigenous medicine to international level and to involve in community health care activities.
1 5	To strengthen collaboration with other countries for national health development.

The Minister for Health is a chairman of central supervision committee for this law. The members of committee are the responsible persons from the Ministry concerned. The City Development Committees have the law of City Development Committee. The regulation and practice of law has been enacted in this law, for example; Yangon City Development Committee Law (1998). The implementing taskforces are headed Mayors of Nay Pyi Taw , Yangon city and Mandalay city respectively. The each subcommittees for each activity are organized under the implementing taskforces. Aiming to reduce environmental pollution, thereby totally eliminate, to develop the environmental friendly towns, the wastewater treatment system in the new settlement areas will be carried out. To achieve the aims, there will be identified it depending on the following circumstances.

- (a) The availability of receiving water body such as river and stream for disposal of effluent after treating wastewater
- (b) In the condition of limited river and stream, availability of suitable land areas as disposal site without any annoyance
- (c) In the condition which river and stream are very long distant, availability of many follow lands

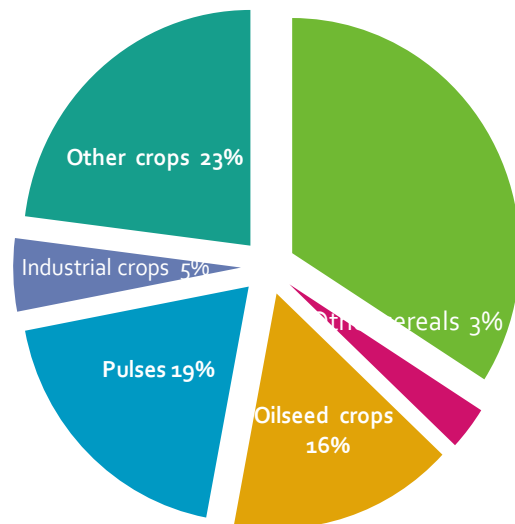
Policies Adopted in Agricultural Sector

- (a) To allow freedom of choice in agricultural production**
- (b) To expand agricultural land and to safeguard the rights of farmers**
- (c) To encourage the participation of private sector in the commercial production of seasonal, perennial crops, and distribution of farm machineries and other inputs**
- (d) To encourage the research and development activities for the improvement of quality and, to increase the production of agricultural crops.**

Strategies Measures For Agricultural Development

- (a) Development of new agricultural land.**
- (b) Provision of sufficient irrigation water**
- (c) Provision and support for agricultural mechanization.**
- (d) Application of modern agro-technologies**
- (e) Development and utilization of modern varieties**

Main crops production in 2010-



5. Research/practice on different aspects of wastewater

Some Constraints for agricultural Policies

- (a) Inadequate pricing policies both for agricultural inputs and products;**
- (b) Lower investment in agricultural research and development;**
- (c) Inadequate human resource development in both Research and Development and agricultural extension;**
- (c) Weak linkages in agricultural research and extension;**
- (d) Inadequate in agricultural credit;**

- (e) Lack of basic physical infrastructure;
- (f) Weakness in strengthening information networks;
- (g) Need to enhance technology capability.

The vegetation farming is still be watered human urine traditionally for a long decade. The human excreta is composted for natural fertilizer. These two technology is scarcely used in practice nowadays.

6. Status and need for the knowledge and skills on the safe use of wastewater

The safe use of wastewater is an important agenda at the ever-lasting development of wastewater treatment technology. Upon the characteristic of wastewater generated, the required efficiency of the treated wastewater and many factors, wastewater reuse could be done for purpose of wastewater irrigation of paddy crop and vegetation and the industrial wastewater reuse for individual process of commodity production (depending on required quality of each production process). But, the arrangements for the wastewater reuse and use have been making in the near future.

The availability of skilled human resources for implementing for safe use of wastewater in all sectors is as long as possible. Many technical persons trained in abroad are available in the local of Myanmar. The mid and raw human resources are available in every parts of country.

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Inadequate human resource development in both R&D and agricultural extension;
Weak linkages in agricultural research and extension;
Inadequate in agricultural credit;
Lack of basic physical infrastructure;
Weakness in strengthening information networks;
Need to enhance technology capability.

The majority of Myanmar people on knowledge and skills on the safe use of wastewater needs to expand because of insufficient knowledge on this matter. The knowledge and capacity gap between technician and people is broadly wide. Apart from this gap, political commitment is highly needed in Myanmar. It can speedily drive the urgent development on the safe use of wastewater management. Prioritizing this agenda is mainly relevant for bringing of the rapid development on safe use of wastewater in the Republic of the Union of Myanmar.

