**ASSIGNMENT N°6 END OF MODULE 6**

**(WASTE MANAGEMENT)**

**COURSE TITLE**

**PGD 002 POSTGRADUATE DIPLOMA IN WATER, SANITATION AND HYGIENE (WASH)**

**(DEVELOPMENT DIMENSIONS AFRICA)**

**BY**

**YAHAYA AOUEL**

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1. **Explain four examples of potential benefits and four examples of possible drawbacks from public–private partnerships in urban sanitation and waste management.**

**Answer**

Benefits from public–private partnerships are many. They include but not limited to the followings:

* They can be more efficient and provide a better service because private companies are motivated by the potential profits;
* Private companies can be specialists in the service area and have access to expert knowledge and special equipment;
* They may be able to access funds that are not available to government offices;
* Also, public-private partnerships help local institutional sanitation and waste management do more with less;

In addition to the four benefits cited above, Public-private-partnerships are powerful tools that can help Government to:

* Develop sanitation and waste management’s workforce, raise awareness about sanitation and waste management (3Rs), solve problems of sanitation and waste management through new technology, speed up response and innovation cycles of sanitation and waste management, Build on the capabilities of others; leverage collective action, improve performance related to sanitation and waste management, connect with organizations that share local Authority goals regarding sanitation and waste management and extend the reach of messages and programs regarding sanitation and waste management, realize cost savings by imposing a corporate tax operating to improve other areas related to sanitation and waste management, as Government budgets shrink.

Many scholars gave their points of view regarding the impact of PPP on the improvement of WASH services to people in urban areas. Elizabeth et al. (1999, p3), in their PPP working paper series volume1 titled ‘‘Public-Private Partnership for the Urban Environment: Options and issues’’ demonstrated that Government agencies alone cannot provide sufficient WASH services to the population, they shall integrate PPP participation when designing. They stated that the rapid concentration of hundreds of millions of people in urban areas has placed an extra ordinary strain on government both national and local to meet citizen’s basic needs. Many governments are finding that their existing water, sanitation and energy infrastructures are unable to service their rapidly expanding population. In addition Governments realize that their limited financial resources are not sufficient to cover needed expansion of these services. Even where governments do find resources to subsidize public utilities, services is often still poor and sector of the population largely unserved. It is becoming increasingly clear that governments cannot meet the continually growing demand for water, waste and energy services acting alone. Governments are finding that their tax revenues are not providing sufficient resources to meet these needs and official development assistance has not been able to fill the gap. New approaches to addressing these problems that involve collaboration among an increasing number of stakeholders are urgently needed. Private partnerships are one of the most promising forms of such collaboration.

**Drawbacks**

There are a number of drawbacks which include but not limited to the followings:

* Private companies may be greedy and more interested in profit than in providing a good service;
* They may not be committed to providing the service over a long period of time and may leave or close down unexpectedly;
* If a single company provides a service with no competition they may take advantage of their monopoly by raising prices;
* Corruption (bribes paid to inspectors and officials to award contracts to a particular firm or to overlook shortcomings and associated penalties) can happen, the cost has to be borne either by the customers or the government through subsidies, most of time PPP is affected by politics which limits its capability, private sector will do only what it is paid to do and no more by forgetting principles of humanity.

The process of PPP is often complex and has limitations. Several findings illustrate similar constraints that face the public sector: financial challenges, low quality personnel, outdated equipment, laborious procurement procedures, rigid working schedule, and constraints on management changes, poor supervision and corruption. Post found that the determining factors for cost effectiveness in privatized solid waste collection are quality of service operation, income level in the service area, technology used and success of the fee collection, (Vin et al. 2019, p2).

1. **Briefly describe the main activities needed for planning improvements in sanitation and waste management in local institutions.**

**Answer**

When developing a plan for an improvement programme, some actions are necessary to achieve the goals. These actions include but not limited to the following:

* Know the scope of activity by identifying the institutions to be included, evaluate feasible service combinations;
* Assess the existing sanitation and waste management situation and identify the main problems, assessment of current status and assessment of user priorities;
* Identify the possible partners that you can work with. Consult all stakeholders to agree on the process to be followed. Finalize the sanitation plans at stakeholder workshop. Responsibilize each stakeholder according to his competency. For example, to the utility in charge for sewerage and sewage treatment, to the local government for on-site sanitation facilities, public, school facilities, to the concerned NGO or Community Based Organization CBO for community sanitation facilities, to the environment regulatory authority for monitoring and control of pollution and also the institutions shall be responsible for promotion of sanitation and hygiene education. Institutions responsible for sanitation must prepare an annual report for public consumption on operations and development of sanitation;
* Identify and prioritise activities taking account of available resources, identify options and indicators to be used, prepare consolidated sanitation plans for project area, develop, implement the plan of action. Monitor, evaluate and feedback, carryout regular inspection of sanitation and waste management facilities at all types of institution is important and make sure that the institutions are required to undertake continual organization development, they are guaranteed long term and autonomous management and private sector, NGOs or CBOs may construct and manage their own sanitation facilities with the approval of the local government and in accordance with local government bylaws and regulations.

1. **Composting is an example of waste recycling but it could also be described as an example of recovery from waste. Explain why this statement is true.**

**Answer**

Composting Is defined as biodegradable stabilized and mineralized humus transformation process by bacteria, micro- and higher-level organisms of decomposable organic constituents (agricultural, urban commercial etc. wastes) in solid wastes. Compost is not fertilizer but is used only for the structural improvement of the soil. However, it is possible to obtain fertilizer in superior quality by adding enough nitrogen, phosphorus, and potassium to the compost (Uygun, 2012). It is the biological decomposition of organic waste in the presence of air. Where appropriate, composting of organic waste is practicable on a domestic and even on an institutional scale, and should be encouraged, as it is environ­mentally friendly, and can considerably reduce the bulk of domestic waste. Veg­etable and plant waste can be thrown into a pit, and will produce useful compost for gardens after a few months.

It may also be possible to co-compost refuse and sludge from emptying latrines and septic tanks. In this case, special attention is required to ensure that com­post heaps attain and maintain adequate temperatures to kill pathogens. If there is any doubt about this, the compost should be stored for at least a year before use (Wisner & Adams, 2003). The benefits of composting are not only the reduction of waste, but also the production of compost which is a valuable soil improver. Composting agricultural and other types of wastes can be a useful process for recycling nutrients and maintaining or restoring levels of organic matter in the soil (Solano, et al., 2001).

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Recycling means reprocessing waste into new material. The first step is separation of waste into different types. The recycling of refuse after collection and transport may be encouraged and facilitated where suitable conditions exist. Sorting paper, glass, metals, and plastics for recycling could be an income-generating activity where these mate­rials are present in significant quantities in the refuse (Wisner & Adams, 2003).

Formal recycling of waste is an ideal practice to encourage as it is environmentally friendly and reduces the volume of landfill needed. However, because of the high level of organization and manpower needed, recycling is unlikely to be practicable in the majority of emergency situations, except in the longer-term stages. Nev­ertheless, in an emergency situation, a certain amount of informal recycling will naturally occur, as there may be a shortage of items such as containers, bags, and other materials.

Recovery is about finding other uses for wastes that enable some value to be extracted or recovered from them, usually by using them as a source of energy. The fourth option (after reduce, reuse and recycling), in the waste hierarchy is recovery. Recovering energy from waste on a large scale using an advanced incineration plant is a high-technology, high-cost option that is common in many developed countries. However, it needs a highly developed infrastructure (a reliable source of waste, good roads, a reliable waste collection service, a power distribution grid, etc.) and large amounts of waste. This technology is currently rarely used in low- and middle-income countries, but as cities develop there is great potential for energy-from-waste in the future in Ethiopia and many other countries (Scarlat et al., 2015).

Regarding the definition of composting, recycling and energy recovery and the characteristics linking them, one can say that composting is an example of recycling because the waste is reformed into a new material, compost, which is different from the original waste. It is also an example of recovery because the compost has value as a soil improver and has been recovered from the waste. Organic waste recovery, composting organic waste is a form of recycling and has similar benefits to other recycling processes. The amount of waste sent to landfill is reduced and the compost can be used locally to improve soils and the crops grown on them. Organic waste can also be used in anaerobic digesters to produce biogas for cooking and lighting. Composting can be scaled up at material- processing and energy-recovery facilities.

1. **Imagine there is a local NGO working in the town you are assigned to that wants to develop a school WASH programme. While preparing the project documents, the delegates of the local NGO come to your office and ask you to support them. Describe the minimum requirements that you will advise them to include in the sanitation and hygiene part of their programme.**

**Answer**

My advice to the NGO may needs to suggest that:

* Separate latrines for different sex and girls should be provided that are located in a convenient place in the school compound, give privacy to users, are easy to clean and agreeable to use. The school WASH programme must have accessible, gender-appropriate toilets and hand-washing facilities, access to potable drinking water and solid waste management with proper boundaries. The school must also teach children appropriate hygiene practices. It should have a practice gender-neutral division of hygiene-related tasks such as cleaning toilets, fetching and boiling water and taking care of the sick;
* The number of latrines should be calculated based on the number of students (one cubicle per 100 students) with a minimum of two cubicles for girls and two for boys, with urinals as well; facilities must be close to the schools, have sufficient capacity, with enough toilets and sinks for the number of students, be sized appropriately and simple to use, and have water and soap available at all times for hand washing as well as anal cleansing;
* Latrines should be designed and constructed to be appropriate for children of the age at the school; small children will need facilities they can reach and feel comfortable using; WASH facilities must feature appropriate dimensions and adjustments for children. Design adaptations can make facilities accessible and comfortable for children. Children are smaller and have less physical strength than adults. Facility designs should reflect these differences. For the youngest children, facilities should be adapted to allow for adults to supervise and help when children use the toilets, handwashing facilities or water points;
* There should be appropriate latrine and handwashing facilities for students with disabilities;

Annemarieke. M (n.d, p 4) stated that WASH in Schools also focuses on the development of life skills and the mobilization and involvement of parents, communities, governments and institutions to work together to improve hygiene, water and sanitation conditions. While there are many approaches based on differing cultural insights and environmental and social realities;

She demonstrated also that any WASH in Schools intervention should include the following requirements:

* handwashing facilities with soap should be provided very close to the latrines with separate facilities for boys and girls. The supply of water for handwashing must be maintained at all times, there should be appropriate provision of menstrual hygiene management facilities that ensure privacy for girls and allow them to dispose of or wash used menstrual pads hygienically; Learn about menstrual hygiene and physical and emotional changes during puberty (learning to avoid menstrual odour, discomfort and urinary or vaginal infections will encourage girls to come to school during menstruation), their WASH programme in Schools should aim to improve the health and learning performance of school-aged children and, by extension, that of their families by reducing the incidence of water and sanitation-related diseases. Every child friendly school requires appropriate WASH initiatives that keep the school environment clean and free of smells and inhibit the transmission of harmful bacteria, viruses and parasites, make sure that WASH services in Schools intervention should include Sustainable, safe water supply points, hand-washing stands and sanitation facilities, ensure that WASH in Schools intervention include Fully integrated life skills education, focusing on key hygiene behaviours for school children and using participatory teaching techniques and should include Outreach to families and the wider community, School WASH programme should learn to observe, communicate, cooperate, listen and carry out decisions about hygienic conditions and practices for themselves, their friends and younger siblings whose hygiene they may care for (skills they may apply in other aspects of life), sensibilize students to change their current hygiene behavior and continue better hygiene practices in the future;
* Their WASH in Schools programme should be efficiently and effectively implemented which lead to students who: Are healthier; Perform better in school; Positively influence hygiene practices in their homes, among family member and in the wider community, the key WASH school programme principles and desired features should be used as guides for interventions, stimulating discussion and creativity for the development of sustainable WASH in Schools programme, these programmes must then be adapted to the practical realities of the school and its surrounding community;
* Sustainable WASH in Schools programmes require the involvement and political leadership of ministries of education as well as related ministries such as health, public works, finance, local governance and water authorities Without the political commitment evidenced in policies, standards and budgets. WASH in Schools should remain externally subsidized. Such small-scale interventions cannot move beyond the pilot stage;
* To become catalysts for building alliances for WASH in Schools, the NGO should be in permanent contact with UNICEF, UNDP, WHO and other partners to focus on gathering evidence, creating all-stakeholders’ consultation venues and facilitating a coordinated, nationwide approach;
* Their NGO school WASH programmes may include elements such as protected wells, rainwater harvesting, piped water or pit latrines with slab, Ventilated improved pit (VIP) latrines, flush toilets or ecological sanitation, the NGO must ensure that each school design and construct child friendly, gender-sensitive, well-made and sustainable facilities for sanitation, hand washing, water supply, compound fencing and solid waste collection,
* The NGO shall ensure external accountability to schools, teachers, children, decision makers and donors; monitoring how resources are spent and benefits distributed; conducting quality control on programmes; evaluating of investments; tracking ecological and financial sustainability; and assessing overall aid effectiveness, the Toilets and water supplies must be appropriately situated within the school grounds. Even a well-designed facility may not be used if it is located in a way that fails to take into account practical, environmental or cultural considerations. This can become especially difficult when there are conflicting solutions or different preferences among user groups. Determining location demands a process of setting priorities and ensuring participatory decision-making. Children need to feel secure when visiting WASH facilities. They should not be at risk of harassment by people or attacks by animals such as snakes, scorpions or spiders. Access routes must be open and clear and the facilities in audible and visible proximity to the community, in the event that immediate assistance is needed;
* Ensure the Water quality: Sufficient water is available at all times for drinking, personal hygiene is in quantity and quality for all schools of their area of responsibility;
* Toilet facilities and urinals should guarantee privacy, particularly for people over the age of eight. Consider cultures requirements because in some cultures, it is important not to be seen entering or leaving the toilet. Access routes may be better situated away from the busy part of the community, while at the same time open and clear for security reasons;
* It must be possible to reach the facilities during all weather conditions, including after heavy rains or flooding. Sufficient lighting is needed for children who use facilities at night (in boarding schools). Facilities only contribute to health and hygiene improvements if properly used. For younger children, adult supervision of behaviour and skills is essential. Some locations will ease supervision. Locating a hand-washing facility near the classroom of younger children, for instance, allows for better monitoring than placing it near the toilet exit, the location of the facilities should allow for security to reduce the risk of vandalism, particularly when communal WASH facilities are being installed. An individual or group of supervisors can be assigned this task, Toilets and urinals are frequently located close to other producers of odours and flies, such as garbage dumps, cattle or animal pens. Such placement discourages people from using them. Facilities should be situated elsewhere or solutions designed to minimize nuisance and environmental degradation, toilets with leach-pits need to be located downstream from a spring (safe distance at least 20-30 metres from wells and water sources to avoid pollution of water sources). The further the horizontal distance the pathogen must travel from the point of entry into the water table, the more likely the pathogen will die. Pits should not be as deep as the groundwater table;
* WASH facilities must provide sufficient capacity and minimal waiting time. For water use in schools, WHO and UNICEF apply a convenient ratio (refer to UNICEF guidelines for drinking water quantity, for example 5 litres per student per day) for drinking and hand washing. When there are not enough toilets, taps and waste bins for the number of schoolchildren, they inevitably urinate and defecate elsewhere and forget to wash their hands, throw garbage on the ground or drink water from unsafe sources. Ensuring the right capacity in facilities is usually not a matter of applying a simple ratio. Different literature and country standards use a ratio of 1 toilet for 20-40 children. Beyond the total number of school children, factors that determine required capacity may include the times when children are allowed to go to the toilet, drink water or wash hands, and the number of classes and future growth of the school population. Arguments that applying this ratio is too costly can be partly countered by the construction of less costly urinals instead of latrines for both girls and boys. WASH facilities must consider the specific needs of girls and women When adolescent girls attend school during menstruation, they need toilets appropriate for girls, a water supply to wash in privacy and covered containers inside the toilet area to dispose of sanitary pads.10 If such facilities are not available, adolescent girls may be unable to remain comfortably in class;
* The school programme of the NGO must be aware of the special needs of children with disabilities which must also be taken into account in facility design plans. There are over a billion people in the world living with some form of disability. Estimates of the number of children with disabilities vary widely, depending on how disability is defined and measured. These wide variations indicate that children with disabilities are too often not identified and therefore do not receive the services they need. These children are often excluded from basic facilities, resulting in isolation, poor health and poverty. The lack of accessible school toilets can deter children with disabilities from attending school. If incorporated into the original design, adaptations can be made at little or no additional expense, adaptations in WASH facilities should be made for at least the following categories of persons with disabilities. Children with poor vision: special grips, guiding systems and proper lighting are needed. Children in wheelchairs or with crutches: facilities should include ramps, wider doors, extra room inside stalls for a wheelchair or assistant and special grips or foldable seats. People with missing or paralyzed limbs: lids, taps and knobs must be light and manoeuvrable with one hand or with feet;
* Advocating, influencing or persuading a decision-making or funding body to increase attention and resources to WASH in Schools, change a policy or law or agree to strengthen the overall WASH sector.

Annemarieke. M (n.d, p 7) argued that each school should work to develop adequate knowledge, attitudes and skills on hygiene through life skills-based hygiene education and child participation. Improving hygiene behaviour must go along with toilet construction and the provision of safe water and washing facilities in schools. Life skills-based hygiene education rests on the principle that new knowledge does not, by definition, translate into new practices. Therefore, life skills-based education seeks to instil hygiene practices into the realities of children’s daily lives, helping them acquire the knowledge of appropriate hygiene behaviours and the skills to use them. This approach considers the learning differences of various stages of child development and addresses them in the programme design, allowing children to effectively transform knowledge into practice.

She continues her arguments by thinking that schools WASH programme should actively engage parents and the community in WASH in Schools interventions. They are key partners during planning, implementation, operation and maintenance of facilities, and have important roles in monitoring the impact of WASH in Schools interventions and taking appropriate measures to improve children’s health. Parents and communities should also be engaged in emergency preparedness and response plans, which address the operation and use of WASH facilities at schools during emergencies. Engaging families and communities ensures that children apply their knowledge at home. Global experience has shown that children are enthusiastic promoters of their newly acquired hygiene skills and can potentially be effective agents of change within their homes and communities. If messaging and practices are consistent with the cultural environment, children’s advocacy can lead to better hygiene practices in homes and communities.

Unicef (1998, p 3) estimates that a good School WASH programme is a comprehensive programme, including: a participatory needs assessment involving students, teachers, parents and community members, formulation of objectives, outputs/results and an action plan, Improved water and environmental sanitation facilities, properly used and maintained facilities, hygiene education for students, teaching aids which build on the practical situation in and around schools, making students aware of the benefits of using improved facilities in a proper and hygienic way and the seriousness of diseases that result from poor SSH ( school, sanitation and hygiene), improved facilities and hygiene education going hand-in-hand, involvement of students in planning, implementation and maintenance, training for technical staff and teachers and monitoring of the programme and its impact, with a focus on self-assessment.

1. **Giving examples explain three examples of ways of encouraging or supporting an ISWM approach**

**Answer**

There are many possible ways of encouraging and supporting ISWM but since the question is to mention only three, then one may have mentioned any three of the following possible ways:

* The national government can allow greater flexibility in budget spending by municipalities;
* Extra funds may be allocated to adopt or extend ISWM;
* Start-up funding can be provided for new initiatives such as waste collection, composting and recycling schemes;
* Special awards could be given to individuals and organizations to celebrate successful projects;
* Providing effective training for people who wish to start new schemes and supporting them in the early stages of development;
* Organizing promotional campaigns to raise awareness of the 3 Rs among all members of the community;
* Increase recycling, waste recycling shall be efficient and economical, minimizing and eliminating the volume and quantity of wastes from landfills, Consider all aspects of waste. To maximize the efficiency of a waste management program, an ISWM plan should account for all aspects of waste, including generation, segregation, collection, transportation, sorting, recovery, treatment, and disposal;
* Create suitable networks for collection and transport of wastes to locations where waste can be reused and recycled;
* When there is effective cooperation between stakeholders implementation of successful waste management plan becomes pertinent Involve stakeholders. Involving all stakeholders, especially the public, in developing and implementing an ISWM plan will enhance its efficacy (e.g., by engaging support for the program);
* Also while promoting waste recycling and cooperation between the different stakeholders, project management can be subjected to high risks and fail in the intended purpose for which the project was planned;
* Analyze weaknesses, strengths, and capacities. Completing an analysis of the weaknesses, strengths, and capacities of their waste management activities will help cities identify the most suitable waste management options and effectively and efficiently implement an ISWM plan;
* Conduct assessment, a robust assessment of the economic, environmental, and social impacts of waste management options can help inform decisions about which options to pursue;
* Select suitable waste management options. Waste management options should be based on local needs and conditions. Cities should identify opportunities to use environmentally preferable waste management options (e.g., waste prevention and reduction) whenever possible;
* A national policy or legislation obliging every city to have a waste management plan, such as in Bulgaria, can create a need for assessments;
* An external donor programme based on commitments made in an international context may offer waste-related funding or technical assistance to the city;
* Coordinate with the national government. National governments play a key role in waste management, especially in establishing and enforcing waste management policies. Cities should work closely with national governments to clarify their respective roles and identify opportunities for mutual support;
* Identify sustainable sources of funding. An ISWM plan must include reliable sources of funding (e.g., user fees) to sustain waste programs. Incorporating the private sector into waste management activities can offer a way to reduce the costs of managing waste while also leveraging private sector expertise;
* Increase cost efficiency in waste management;
* Develop ISWM Management: The four sets of guidelines on ISWM covering waste characterization and quantification, assessment of current waste management system, target setting and identification of stakeholders’ issues of concern for ISWM, and how to develop ISWM Plan;
* Pilot projects on ISWM and emerging waste streams including E-waste, waste agricultural biomass, waste plastics and so on;
* Regional and sub-regional training for policy makers and experts on ISWM and emerging waste streams;
* Interactive advisory support on ISWM and emerging waste streams
* Society shall be accountable and responsible in waste reduction, e.g., decoupling waste increase from economic growth.

According to ISWA(n.d), *Solid Waste: Guidelines for Successful Planning*, Integrated solid waste management (ISWM) planning is a dynamic tool including aspects that range from policy-making and institutional development to technical design of integrated solutions for the handling and disposal of waste. The concept of ISWM differs a lot from the conventional approach towards waste management by seeking stakeholder participation, covering waste prevention and resource recovery, including interactions with other systems and promoting an integration of different habitat scales (city, neighborhood, household). ISWM does not cope with waste management as just a technical issue, but also recognizes the political and social factor as the most important.

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