



جامعة
بنغازي الحديثة



**مجلة جامعة بنغازي الحديثة للعلوم
والدراسات الإنسانية
مجلة علمية إلكترونية محكمة**

العدد السادس

لسنة 2019

حقوق الطبع محفوظة

شروط كتابة البحث العلمي في مجلة جامعة بنغازي الحديثة للعلوم والدراسات الإنسانية

- 1- الملخص باللغة العربية وباللغة الانجليزية (150 كلمة).
- 2- المقدمة، وتشمل التالي:
 - ❖ نبذة عن موضوع الدراسة (مدخل).
 - ❖ مشكلة الدراسة.
 - ❖ أهمية الدراسة.
 - ❖ أهداف الدراسة.
 - ❖ المنهج العلمي المتبع في الدراسة.
- 3- الخاتمة. (أهم نتائج البحث - التوصيات).
- 4- قائمة المصادر والمراجع.
- 5- عدد صفحات البحث لا تزيد عن (25) صفحة متضمنة الملاحق وقائمة المصادر والمراجع.

القواعد العامة لقبول النشر

1. تقبل المجلة نشر البحوث باللغتين العربية والانجليزية؛ والتي تتوافر فيها الشروط الآتية:
 - أن يكون البحث أصيلاً، وتتوافر فيه شروط البحث العلمي المعتمد على الأصول العلمية والمنهجية المتعارف عليها من حيث الإحاطة والاستقصاء والإضافة المعرفية (النتائج) والمنهجية والتوثيق وسلامة اللغة ودقة التعبير.
 - ألا يكون البحث قد سبق نشره أو قُدم للنشر في أي جهة أخرى أو مستل من رسالة أو اطروحة علمية.
 - أن يكون البحث مراعيًا لقواعد الضبط ودقة الرسوم والأشكال - إن وجدت - ومطبوعاً على ملف وورد، حجم الخط (14) وبخط (Arial 'Body') للغة العربية. وحجم الخط (12) بخط (Times New Roman) للغة الإنجليزية.
 - أن تكون الجداول والأشكال مدرجة في أماكنها الصحيحة، وأن تشمل العناوين والبيانات الإيضاحية.
 - أن يكون البحث ملتزماً بدقة التوثيق حسب دليل جمعية علم النفس الأمريكية (APA) وتثبيت هوامش البحث في نفس الصفحة والمصادر والمراجع في نهاية البحث على النحو الآتي:
 - أن تُثبت المراجع بذكر اسم المؤلف، ثم يوضع تاريخ نشره بين حاصرتين، يلي ذلك عنوان المصدر، متبوعاً باسم المحقق أو المترجم، ودار النشر، ومكان النشر، ورقم الجزء، ورقم الصفحة.
 - عند استخدام الدوريات (المجلات، المؤتمرات العلمية، الندوات) بوصفها مراجع للبحث: يُذكر اسم صاحب المقالة كاملاً، ثم تاريخ النشر بين حاصرتين، ثم عنوان المقالة، ثم ذكر اسم المجلة، ثم رقم المجلد، ثم رقم العدد، ودار النشر، ومكان النشر، ورقم الصفحة.
2. يقدم الباحث ملخص باللغتين العربية والانجليزية في حدود (150 كلمة) بحيث يتضمن مشكلة الدراسة، والهدف الرئيسي للدراسة، ومنهجية الدراسة، ونتائج الدراسة. ووضع الكلمات الرئيسية في نهاية الملخص (خمس كلمات).

3. تحتفظ مجلة جامعة بنغازي الحديثة بحقها في أسلوب إخراج البحث النهائي عند النشر.

إجراءات النشر

ترسل جميع المواد عبر البريد الإلكتروني الخاص بالمجلة جامعة بنغازي الحديثة وهو كالتالي:

- ✓ يرسل البحث إلكترونياً (Word + Pdf) إلى عنوان المجلة info.jmbush@bmu.edu.ly او نسخة على CD بحيث يظهر في البحث اسم الباحث ولقبة العلمي، ومكان عمله، ومجاله.
- ✓ يرفق مع البحث نموذج تقديم ورقة بحثية للنشر (موجود على موقع المجلة) وكذلك ارفاق موجز للسيرة الذاتية للباحث إلكترونياً.
- ✓ لا يقبل استلام الورقة العلمية الا بشروط وفورمات مجلة جامعة بنغازي الحديثة.
- ✓ في حالة قبول البحث مبدئياً يتم عرضة على مُحكمين من ذوي الاختصاص في مجال البحث، ويتم اختيارهم بسرية تامة، ولا يُعرض عليهم اسم الباحث أو بياناته، وذلك لإبداء آرائهم حول مدى أصالة البحث، وقيمتها العلمية، ومدى التزام الباحث بالمنهجية المتعارف عليها، ويطلب من المحكم تحديد مدى صلاحية البحث للنشر في المجلة من عدمها.
- ✓ يُخطر الباحث بقرار صلاحية بحثه للنشر من عدمها خلال شهرين من تاريخ الاستلام للبحث، وبموعد النشر، ورقم العدد الذي سينشر فيه البحث.
- ✓ في حالة ورود ملاحظات من المحكمين، تُرسل تلك الملاحظات إلى الباحث لإجراء التعديلات اللازمة بموجبها، على أن تعاد للمجلة خلال مدة أقصاها عشرة أيام.
- ✓ الأبحاث التي لم تتم الموافقة على نشرها لا تعاد إلى الباحثين.
- ✓ الأفكار الواردة فيما ينشر من دراسات وبحوث وعروض تعبر عن آراء أصحابها.
- ✓ لا يجوز نشر إي من المواد المنشورة في المجلة مرة أخرى.
- ✓ يدفع الراغب في نشر بحثه مبلغ قدره (400 دل) دينار لبيي إذا كان الباحث من داخل ليبيا، و (200 \$) دولار أمريكي إذا كان الباحث من خارج ليبيا. علماً بأن حسابنا القابل للتحويل هو: (بنغازي - ليبيا - مصرف التجارة والتنمية، الفرع الرئيسي - بنغازي، رقم 001-225540-0011. الاسم (صلاح الأمين عبدالله محمد).
- ✓ جميع المواد المنشورة في المجلة تخضع لقانون حقوق الملكية الفكرية للمجلة.

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Study of some variables and their affects on flooding out of septic tanks in Wadi Ataba, Fezzan, Libya

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Abstract

Study was conducted on septic tanks during April 2017 in Wadi Utba area – it is a part of Fezzan area that located western south Libya - to investigate the affect of some variables on septic tanks flooding out. Data was collected using questionnaires from number of random samples 213 questionnaires. Frequencies and percentage, in addition, mean and standard deviation were used to show and analyze data. Results showed that 11.3% of septic tanks always flooded, whereas 28.2% sometimes flooded and 60.6% have never flooded. For age of septic tanks it was found that 44.6% of septic tanks with age less than 10 years, 38.5% from 10 to 20 years, the remain percentage was 16.9% for septic tanks which have more than 20 years. With related to pumped out of septic tanks, it was found that 52.6% never pumped out since they have constructed, whereas 28.6% pumped out once during 1 to 4 months.

Keywords: Diseases, Septic tanks, Soil, Contamination, Wadi Ataba.

المخلص:

اجريت هذه الدراسة على الابار السوداء (البيارات) خلال شهر أبريل 2017م بمنطقة وادي عتبة وهي جزء من منطقة فزان الواقعة جنوب غرب ليبيا وذلك لمعرفة تأثير فيضان البيارات على الوسط ومدى ملائمتها للبيئة المحيطة بها. وقد تم جمع البيانات باستخدام الاستبانة من عينة عشوائية بلغ قوامها 213 استبانة. استخدمت التكرارات والنسب المئوية بالإضافة الى المتوسطات الحسابية والانحراف المعياري في عرض وتحليل البيانات. وقد أوضحت النتائج أن 11.3 % البيارات تفيض دائما، في حين 28.2 % منها تفيض أحيانا، وكانت نسبة 60.6 % من البيارات لم تفيض إطلاقا. أما بالنسبة لعمر البيارات بمنطقة وادي عتبة وفقد وجد أن 44.6 % منها عمرها اقل من 10 سنوات و 38.5 % من أجمالي البيارات عمرها من 10 الي 20 سنة والنسبة الباقية 16.9 % عمرها أكثر من 20 سنة. وفيما يتعلق بعدد مرات سحب البيارة (التخلص منها بواسطة شاحنات خاصة) فقد وجد أن 52.6 % من البيارات لم يتم سحبها منذ إنشائها، في حسن أن نسبة 28.6 % من البيارات تسحب مرة واحدة خلال من 1 الى 4 شهور.

الكلمات المفتاحية: الامراض، البيارات، التربة، التلوث، وادي عتبة.

Introduction

The purpose of the septic tank is to provide an environment for the first stage of treatment in onsite and decentralized wastewater systems by promoting physical settling, flotation, and the anaerobic digestion of sewage. Additionally, the tank allows storage of both digested and undigested solids until they are removed. A septic tank means any watertight, covered receptacle that is designed and constructed to receive the discharge of sewage from a building sewer or preceding tank, stores liquids for a detention period that provides separation of solids from liquid and digestion of organic matter, and allows the effluent to discharge to a succeeding tank, treatment device, or soil dispersal system (1).

Septic tanks allow the separation of solids from wastewater as heavier solids settle and fats, greases, and lighter solids float. The solids content of the wastewater is reduced by 60-80% within the tank. The settled solids are called sludge, the floated solids are called scum, and the liquid layer in between is called the clear zone. Although the liquid in the clear zone is not highly treated, it is greatly clarified compared to the wastewater entering the tank, the larger particles having migrated to either the sludge or scum layers. Another important function of the tank is storage of these accumulated solids. The tank is sized large enough to hold solids until maintenance (i.e., tank pumping) is performed. The effluent, or wastewater, that leaves the septic tank comes from the clear zone to minimize the solids loading on the downstream components of the system. The baffle, tee, or effluent screen at the outlet is designed to draw from the clear zone retaining floatable or settleable solids in the tank. The settling process requires time to occur, so the tank must be large enough to retain the wastewater in a turbulence-free environment for two to four days. Excessive flow and turbulence can disrupt the settling process, so tank volume, size shape, and inlet baffle configuration are designed to minimize turbulence (2).

Septic tank solids include both biodegradable and non-biodegradable materials; although many of the solids will decompose, some solids will accumulate in the tank. Anaerobic and facultative biological processes in the oxygen-deficient environment of the tank provide partial digestion of some of the wastewater components. These processes are slow, incomplete, and odor producing. Gases (hydrogen sulfide, methane, carbon dioxide, and others) result from the anaerobic digestion in the tank and may create safety hazards for improperly equipped service personnel. The gases accumulate in bubbles in the sludge that, as they rise, may re-suspend settled solids. This will elevate the total suspended solids (TSS) concentration in the clear zone and ultimately send more suspended solids to downstream system components. This scenario often results when active digestion occurs during warm temperatures. Attempts to reduce discharge of re-suspended solids led to the development of tank features such as gas deflectors. Effluent screens now help to perform this function. The objectives of this study are to study some variables that related to septic tanks such as size, age, type of soil and their affect on septic tanks flooding, in addition to study negative effects on surrounding area (1)

Methodology

Study area: Wadi Ataba is an area extended from west to east, comprise Valleys of Amsak, Matkhandoosh Mountain, Barjuj valley, Engarran valley, sharrabah valley, Um Alhamam valley until the oasis of Azzergan Palm Trees that located east Murzuk city. Wadi Ataba concludes 9 villages: Engarran, Tasawa, Agar, Tagroten, Marhaba, Um- Alhamam, Al-subetat and Dojal. Data was collected using questionnaire from

number of random samples 213 questionnaires. Frequencies and percentage, in addition to mean and standard deviation were used to show and analyze data using SPSS version 19.

Results and discussion

Results demonstrates that percentage of septic tanks that always flooded out in Wadi Ataba area is 11.3% from the total of samples whereas 28.2% sometimes flooded out between a period and another while the major percentage that 66.6% for septic tanks that never had flooded out (Figure 1.1) illustrated that.

For age of septic tanks in the area, percentage of septic tanks which have age less than 10 years about 44.6% and that with age from 10 – 20 years 38.5% while for septic tanks with age that more than 20 years is 16.9% (Figure 1.2). Correlation indicated significantly between age and rate of flooding out of septic tanks (0.241). As a septic tank is old, possibility of flooding out could happen frequently and that will be depend on many factors such as size, type of soil, maintenance of soil and number of family individuals where these factors increase septic tanks age and conserve quality of water and also protect the community from diseases (3). The advantages of septic tanks are simplicity, reliability, low cost, low maintenance requirements, nutrients in waste are returned to soil and a properly designed, well-maintenance system can last for more than 20 years(4)

With related to number of individuals in families, it was found that 31% for families that have less than 5 individuals while 16% for families more than 10 individuals (Figure 1 – 3). Correlation between number of individuals in families and flooding out of septic tanks was – 0.227.

Results indicated that percentage of septic tanks that never pumped out since they have constructed were the highest because most of them constructed newly subsequently they do not have a long time to flood out or may be constructed on sand soil that allow to wastewater to absorb quickly (Figure 1.4) and support the previous results that the percentage of flooding out were for septic tanks that never flooded out (5, 6).

For distance of septic tanks from the nearest water source, percentage of 35.2% of septic tanks with distance more than 800 meter, 25.8% of them less than 100 meter while 19.7% with distance from 200 meter to 400 meter, the lowest percentage was 19.2% from 400 – 800 meter (Figure 1.5). The important thing in any septic tanks whether constructed of concrete, plastic or glass fibers are that must be watertight and wastewater away from groundwater (5). A proper distance between septic tanks and the nearest water source that suggested from some workers were 30 meters (3). This study found that percentage of 47.1% of septic tanks in the area with distance more than 200 meters and this might be safe distance and insure for wastewater to not access groundwater (5).

Results showed that 89.2% of septic tanks in the area built up with blocks and have concrete roofs while 10.8% of them whether built up with blocks but there were not concrete roof or there were not built up with blocks and no concrete roofs , and the percentage was highest in Engarran village (50%), following by Dojal village (24%) and Um Alhamam village (17.3%) whereas the lowest percentage was in Al-subetat village (3.5%) (figure 1.6). A proper septic tanks in design in Wadi Ataba were high and this is very important and play a major role to minimize septic tanks flooding out. Dangerous of improper design septic tanks exceed the ecological and

health damages to possibility of fall some people into septic tanks and died specially elders and children; in fact some cases were happened in the area. The percentage of improper design of septic tanks were 50% in Engarran and 25% in Dojal and this critica indicator (8).

Household wastewater is loaded with diseases- causing bacteria and viruses as well as high levels of nitrogen and phosphorus. If a septic system is well-maintained and working properly, it will remove most of these pollutants. Insufficiently treated sewage from septic systems can cause groundwater contamination, which can spread disease in humans and animals. Improperly treated sewage also poses the risk of contaminating nearby surface waters, significantly increasing the chance of swimmers contracting a variety of infectious diseases, from eye and ear infections to acute gastrointestinal illness and hepatitis.

Conclusion

Study investigated some variables and their affects on flooding out of septic tanks in Wadi Ataba area, these variables are age, number of family individuals, pumping out, distance from water supply and design. Study showed that age of septic tank is one of affecting factors because as a septic tank is old as possibility of flooding out increase and vice versa. Considerable percentage of septic tanks in the area with age less than 10 years subsequently the rate of frequently flooding out is low. When there are big families, rate of water consumption will increase and that cause quickly filling. Pumping out frequently lead to long use and rarely flooding out. It was found that half of septic tanks never pumping out since they have constructed. Distance between septic tanks and water source must be enough to insure safety for people and surrounding area and to make sure the effluents never reach groundwater. Most of septic tanks in the study area are far from water source with distance more than 200 meters, and that is a safe distance whereas the remain number of them less than 100 meters so more researches are needed to know the exactly distance. For septic tanks design and it's relation with flooding out, study concluded that all septic tanks in the area do not properly design but the only point that this study focusing on is (Is a septic tank build up and has cement roof ?. it was found that septic tanks that properly design are watertight and keep effluents till treatment operation. Household wastewater contains bacteria, viruses, household chemicals and excess nutrients such as nitrates, all of which can cause health problems. Chemicals improperly released through a septic system can also pollute the local water source and community use for drinking water, commercial and/or recreational activities.

Reference

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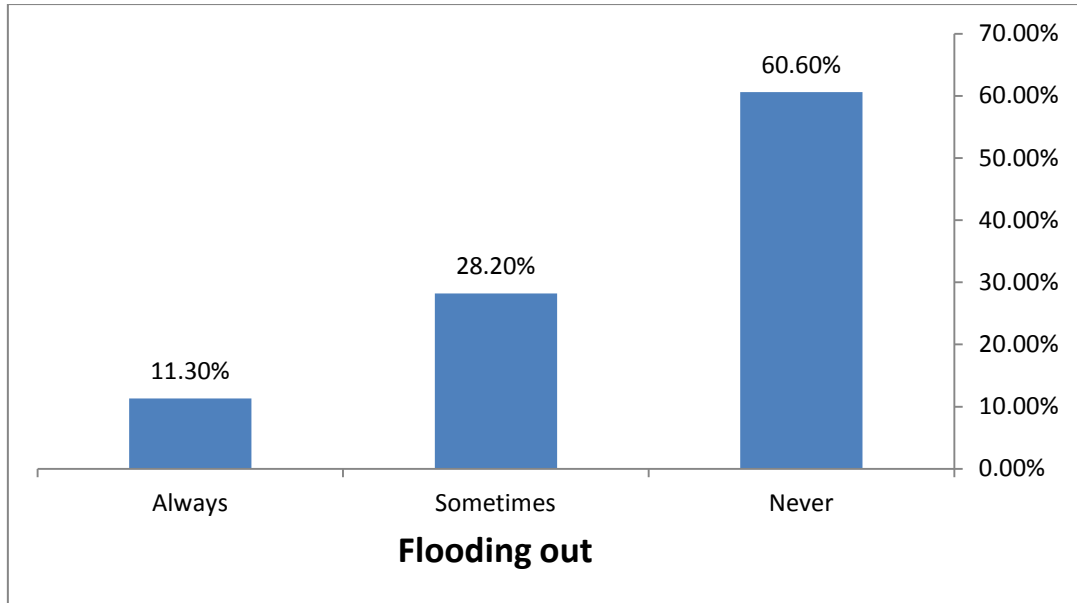


Figure (1.1) Frequencies for flooding out of septic tanks

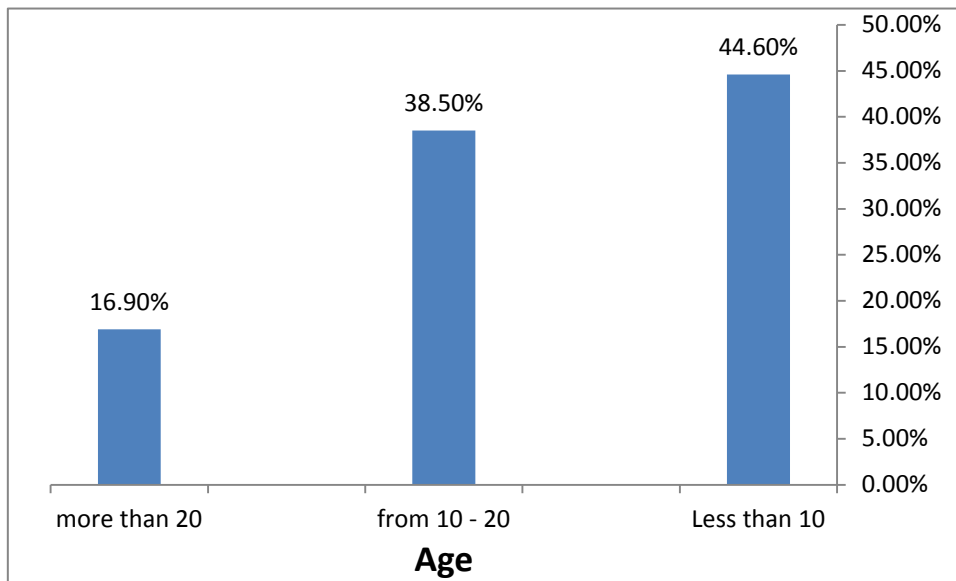


Figure (1- 2) Frequencies for age of septic tanks

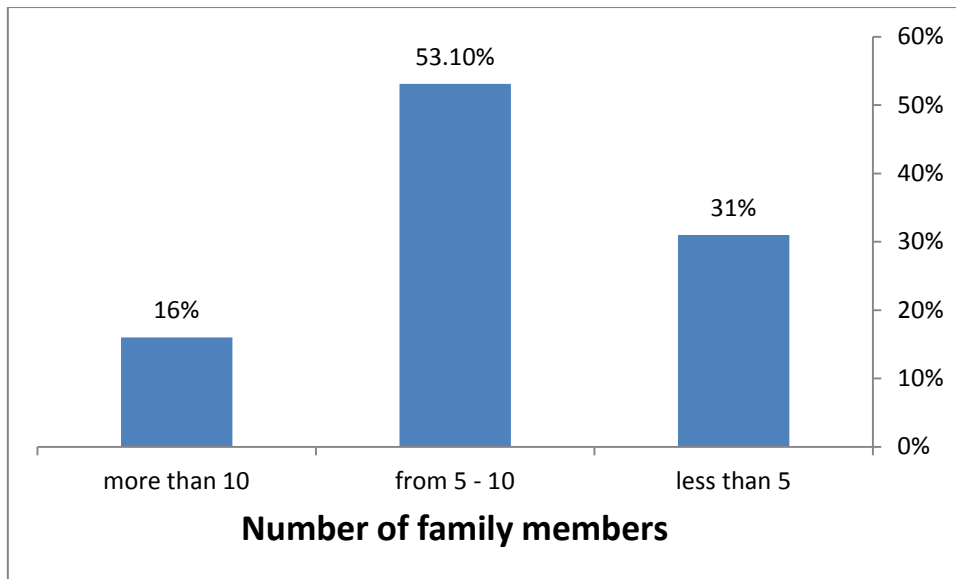


Figure (1.3) Frequencies of number of family members

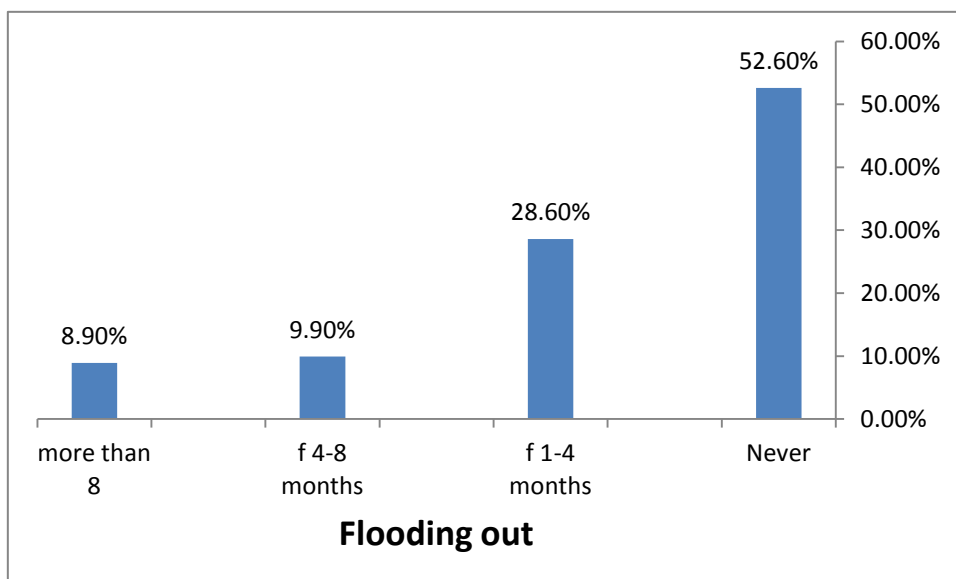


Figure (1.4) Frequencies of pumping out of septic tanks

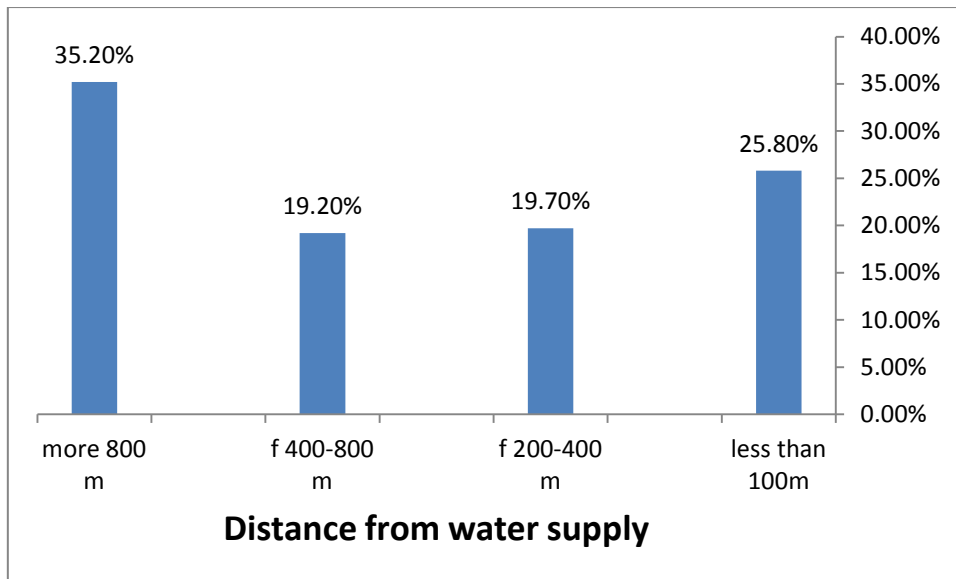


Figure (1.5) Frequencies of the distance from water supply

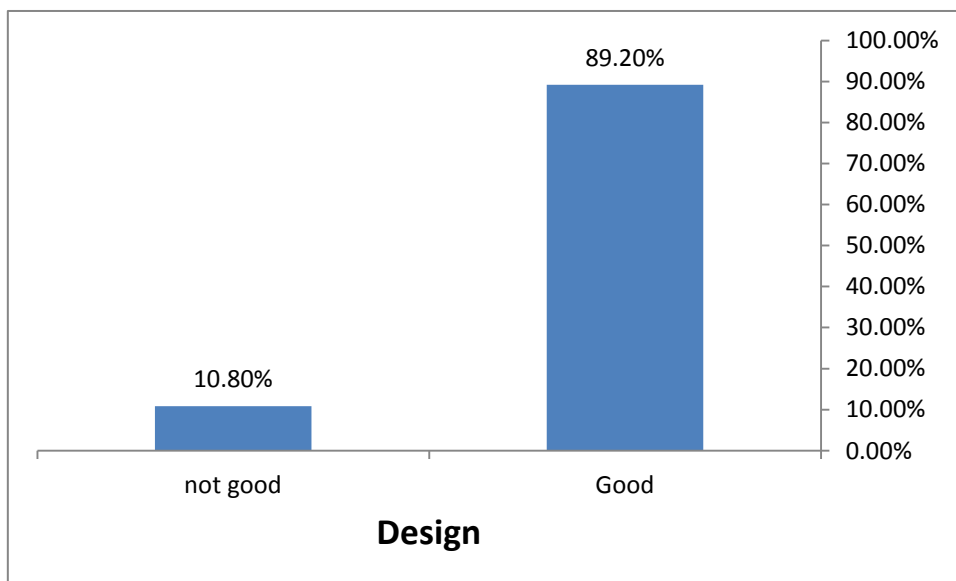


Figure (1.6) Frequencies of design of septic tanks