

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

أَنْزَلَ مِنَ السَّمَاءِ ۖ فَسَالَتْ أَوْدِيَةٌ بِقَدَرِهَا فَاحْتَمَلَ السَّلِيلُ ۗ زَبَدًا مُّوَابِقًا ۚ وَمِمَّا

يُوقُونَ عَلَيْهِ فِي النَّارِ خِمْاءَ ۖ حَلِيَّةٍ أَوْ مَتَاعِ زِبَدٍ مِّثْلَهُ ۚ كَذَلِكَ يَضْرِبُ اللَّهُ

الْحَقَّ وَالْبَاطِلَ ۚ فَأَمَّا الزَّبَدُ فَيَذْهَبُ جُفَاءً ۖ وَأَمَّا مَا يَنْفَعُ النَّاسَ فَيَمْكُثُ فِي

الْأَرْضِ ۚ كَذَلِكَ يَضْرِبُ اللَّهُ الْأَمْثَالَ

صدق الله العظيم

آية (١٧) سورة الرعد

DEDICATION

To the soul of my mother, who encouraged, inspired me throughout my life. To my brothers who never refrained from helping and supporting me. Their continuous spurt whenever needed made success both possible and rewarding.

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ABSTRACT

Study of the Gash River revealed that it is an ephemeral braided unpredictable river. The flood of 2003 caused damages of extensive losses including lives, properties, resulting in an estimated loss of **575** million U.S.Dollars.

.Kassala Town lies in the beginning of the Gash River Delta on its eastern bank.Kassala is historically known to be an important agricultural and commercial centre was the capital of the Eastern Region, then it became the capital of Kassala State. The length of the Gash River in the vicinity of Kassala Town under study is 9 kilometers upstream and 9 kilometers downstream Kassala bridges. The study includes consideration of the bridges and their effect on the river morphology and hydrology. The main objective is the appraisal examination of the existing protection and training structure, as well as checking and quantifying the sediment transported into the Gash River to the channel and the delta.

Data collected and analysis revealed that the Gash River transports 15 million tons (40 million cubic meters) of sediment annually passing downstream Kassala bridges to its delta.

The appraisal revealed that although the adopted spur and dike system was and still is the ideal approach to train the Gash River and protect Kassala Town, yet the conducted undesired activities in its flood plain guide banks and bed were the main causes of inundation of KassalaTown.A second technical reason but not less important than the undesired activities is the absence of maintenance to the existing heads and shanks of the spurs.

It was clearly observed during the period from 1975 to 1984, when undesired activities were not practiced the bed of the Gash River in the vicinity of Kassala Town was 10 centimeter below the general ground level of Kassala Town. After 1984 the undesired activities became great. Cross cutting of the spur shanks was conducted in almost all the spur shanks upstream and downstream the bridges. The cross sectional distance between the heads of the spurs heads restricted by design to be only 120 meters became much more than double the distance and in some cases three as much. Bore wells are dug directly with the guide banks outer toe which should have been according to design restriction more than 20 meters. Due to these reasons it was observed that the bed of the Gash River became 2 meter higher than the Kassala town ground level. Hence the two bridges became like a bottle neck obstructing the flow. It is therefore concluded and recommended to enforce a law prohibiting these undesired activities as well as maintaining and rehabilitation of the existing spur dike system. This will only and only be the paved road leading to the protection of Kassala Town and Training the Gash River.

التجريد

دراسة نهر القاش اوضحت انه نهر موسمی متقسم ويصعب التنبؤ عنه. الغرق الذى حدث عام ٢٠٠٣ تسبب فى خسائر فادحة لمدينه كسلا . شملت تلك الكارثة وفيات وفقدان امتعه قدرت بما لا يقل عن خمسمائه خمسه وسبعون مليون دولار امريكى.

تقع مدينه كسلا على الضفة الشرقيه فى بدايه دلتا نهر القاش وكسلا معروفه تاريخيا بانها عاصمة الاقليم الشرقى ثم بعدها صارت عاصمة ولاية كسلا. تشمل هذه الدراسه حوالى تسعه كيلو مترات امام وعشرة كيلومترات خلف كبرى كسلا. كما تشمل الدراسه التعرض للكبريين وآثارهما على مورفولوجيه وهيدرولوجيه نهر القاش.

الهدف الاساسى للدراسه هو تقييم منشآت الحمايه والترويض القائمه اضافه لمراجعة كميات الطمى التى يرحلها نهر القاش فى المجرى حتى الدلتا.

تجميع وتحليل البيانات اوضحت ان نهر القاش يحمل حوالى خمسة عشر مليون طن (اربعين مليون متر مكعب) من الطمى سنويا تعبر تحت الكبريين الى الدلتا.

التقييم اوضح انه بالرغم من ان نظام العراضات والجسور كان ولا زال الطريقه المثلى لترويض نهرالقاش وحمايه مدينه كسلا لكن الممارسات غير المرشده فى حوض النهر الفيضى والجسور والمجرى كانت هى السبب الاساسى المباشر لغرق مدينة كسلا. هذا بالاضافه لسبب فنى لا يقل اهميه عن الممارسات غير المرشده يتمثل فى غياب الصيانه الدويه تماما عن رؤس وسيقان العراضات القائمه.

حسب الرصودات التى تمت بين عامى ١٩٧٥ و ١٩٨٤ عندما لم تبدأ الممارسات غير المرشده كان منسوب مجرى نهر القاش عند مدينة كسلا اقل من منسوب المدينه العام بعشره سنتيمترات. بعد عام ١٩٨٤ صارت الممارسات غير المرشده كثيره. تقريبا كل جسور (سيقان) العراضات امام وخلف الكبريين حفرت فيها مجارى وقواطع عميقه. المسافه بين رؤس العراضات المتبقيه بالشرق والغرب والمحدده بقانون التصميم الصارم والمحسوب ب ١٢٠ متر صار اكثر بكثير من الضعف وفى بعض الحالات ثلاثه اضعاف. الآبار الجوفيه تم حفرها ملاصقه لردميات الجسور والمحدده ايضا حسب قانون التصميم المحسوب والصارم بما لا يقل عن عشرين مترا. لهذه الاسباب لوحظ ان منسوب مجرى نهر القاش عند مدينة كسلا ارتفع مترين فوق منسوب مدينه كسلا. لذلك صار الكبريين ينظر اليهما بانهما يكونان عنق زجاجه لتمرير مياه الفيضانات خلف كبرى مدينة كسلا. لهذه الاسباب فقد خدمت الدراسه بالتوصيه لسن قانون يمنع الممارسات غير المرشده فورا بالاضافه للشروع ايضا فورا فى صيانة وتأهيل نظام الجسوروالعراضات القائمه. هذا فقط سيكون الطريق الممهد لحماية مدينة كسلا وترويض نهر القاش.

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