

Short Report on the field visit to Freweign (Sinkata)-Hawzien, and Abreha Weatsbeha-Hawzien Roads

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1. Introduction

As part of the on-going research project development, a one day field visit was carried out on the date March 23, 2013 to the project sites. Luckily the field visit coincided with the first heavy rainfall which took place on March 22, 2013. This gave an opportunity to observe a number of issues related to road project ideas:

- Flood from culverts is affecting dwelling houses and farm lands;
- Water logging at the road sides is affecting not only the safety of the roads but also farm lands of the communities;
- Flood from roads affecting surface water reservoirs (like Horeye);
- Flood water recharging shallow groundwater systems.

2. Site condition

The majority of the soils along the plains which the roads cross is dominantly sandy/silty in nature (Plate 1) and shallow groundwater is among the commonly used technologies for small-scale irrigation as well as for water supply in the area. The underlying rock is sandstone (named as the “Entich Sandstone” which is friable in nature. In some cases, metamorphic rocks are exposed along valley floors of the Freweign-Hawzien road. In all cases, these rocks provide shallow groundwater aquifer systems.



Plate 1: View of the plains at Freweign area which the road under construction passes through. The communities at down side of the road are endangered by the flood from culverts.

Thousands of hand-dug wells are developed in the plains (Plate 2a, b, c) which the roads are crossing and more hand-dug wells are under construction as well (Plate 3). The hand-dug wells have depths which vary from 5m-10m and the diameter varies from 6m to 8m.



Plate 2a: A road passing close to an existing hand-dug well which is used for small-scale irrigation along the Freweign-Hawzien road.



Plate 2b. Hand-dug well for small-scale irrigation along the Abreha Westbeha-Hawzien road.



Plate 2c: Hand-dug wells used for small-scale irrigation along the Abreha Wetsbehawzien road.



Plate 2d: Shallow well (for water supply) at the road side of the Abreha Wetsbeha-Hawzien road. Well was developed after the road construction but there is a plan to upgrade the road to an asphalt.



Plate 3: Hand-dug well which is under construction in Freweign (Sinkata) area .

3. Issues related to road construction and

Due to the fact that the field work was carried out the next day after the heavy rainfall of March 22, 2013, several hydrological issues were noted along the roads.

3.1 Water logging at the road sides

At different sections of the road which is under construction, ponding of water was observed (Plate 4) which could be guided for enhanced recharge of the shallow groundwater system of the area. It is important to mention that several hand-dug wells exist at the down sides of the roads. The communities have good experience of small-scale irrigation but they complain that many of the wells dry-up in the late months of the dry season.



Plate 4: Ponding of water at the road side of the Freweign-Hawzien road.

3.2 Flood from culverts affecting dwelling houses and small rural villages

Due to the change in the hydrology of the areas, runoff from road sides and upslope is affecting communities (Plate 5). The communities are made complaints that their farm land and dwelling houses is affected by the flood (Plate 6). Some of the surface reservoirs (Horeye) is also filled with flood water (silting-up the reservoirs) as a result of the road construction (Plate 7).



Plate 5: Ponding of water at the road side and endangered dwelling houses from floods from culverts. The consultant of the road plans to channel the flow from culverts down up to 1km from the road.



Plate 6: Representative of the communities affected by the flood explaining the issue at Freweign-Hawzien road.



Plate 7: A 3m deep surface reservoir (Horeye) filled with flood water from road sides at the Freweign-Hawzien road.

4. Opportunities for the proposed research project

The proposed research has great opportunities to be effectively implemented in this area for a number of reasons:

- Shallow groundwater is the main source of water for small-scale irrigation as well as for water supply in the study area. One of the major problem with groundwater in the area is the lowering of the water table. Through proper management of flood water from roads the groundwater could be recharged effectively.
- The soil in the area is sandy/silty type which makes it very favorable for groundwater recharge and development.
- The communities have indicated that shortage of water is a critical problem. Now that there is flood water from roads, it can be considered as an opportunity rather than a risk of properly utilized for enhanced groundwater recharge.
- The consultant's as well as the client's concern of channeling the water from roads to several Kms distance could be solved by trying to recharge the groundwater system.
- The practice and experience which could be gained from this project could be used a model for further integrated approach of road design and water harvesting.