**Introduction**

The countries that are among the poorest countries of forest per capita level in the world, forest preservation is important. Forests are headspring of rivers and water sources that supply for agriculture. Forest with produce of Homus that has textured sponge is causing keep water and excretion of it for over time, that this prevents the creation of flood and act as a natural dam and provide water in the dry season. Tissue most sensitive to erosion can be seen in most parts. Sediment production in this area is 149,880 tonnes per year. This area has humid climate with most stable. The present research try to establish link between climatological effects and forest cover decreasing with maximum debit discharge and trying to assess interplay of two natural parameters on flooding within two determined period before and after harvesting.

**Materials and methods**

Shafarood areas has equivalent of 349.9 kilometers and set west of Gilan, Longitude 48 6 30 until 48 41 degree east and Latitude 37 25 until 37 34 30 North. Maximum height is 2903 meters and the minimum is 60 meters. Geological structure of the second period and expand layers sensitive to erosion can be seen in most parts. Sediment production in this area is 149,880 tonnes per year. This area has humid climate with annual precipitation 1431.76 mm and containing water regimen in autumn. Maximum rainfall in the area Shafarood in autumn (October) is 240.5 mm and minimum rainfall in summer (July) 60.9 mm. The average annual temperature is 5.16 mm and the maximum evapotranspiration occur in summer (July). The maximum debit discharge to be in March 9.22 in August and the least 2.99 cubic meter per second. 100.7 km is the basin environment and has a slope 6.06%, textured soil is heavy to very heavy. Quality of vegetation were used with Landsat_Tm processing satellite images in 1991. statistics of Exploitation collected from the Natural Resources Office of Gilan province and arranged to annual cutting, which were statistics included number and volume of trees harvested in the years of harvesting.

**Research Paper**

**The effect of Forest canopy Decrease in runoff amount on shafarood basin**

Sh. Sobh zahedi, M. Alidoust & M. R. pournasrollah

Researchers of Agricultur & Natural resource research center of Gilan province, Iran

Received: 2012-03-04  Accepted: 2012-03-28

Abstract: Many factors interfering in flooding of a watershed such as climatological characteristic (precipitation), cover diversity and physiography, The only factor which interfering on watershed could be precipitation of independent variable and harvest. The other factors mostly stable. The present research try to establish link between climatological effects and forest cover decreasing with maximum debit discharge and trying to assess interplay of two natural parameters on flooding within two determined period before and after harvesting. By applying precipitation data, number of harvested trees along with watershed debit before and after harvesting by using of regression method and correlation coefficient for each independent variable. There is a regular relation for each independent variable with increasing precipitation debit base which shown an increasing. Meanwhile before harvesting start (from 1978) in spite of decreasing in precipitation ratio we observed that the debit amount has increased. The study basin more able mean shown among 2,3 and 5 annual precipitation determined that before harvesting the area get enough water but after harvesting (in 1985 and soon) annual precipitation decreased but debit ration with respect to the last year increased. By accessing the mean debit in harvesting seasons the observation shown that before harvesting months, the water regime in study area imitating of precipitation with autumn and peak debit could be observed, in winter season. It is in least range but by evaluating after harvesting observation denoted that in winter season. There is pseudo peak, by comparing with last year precipitation observation shown that range of debit has increased but in winter this debit could be equal with autumn debit. Statistical data of pounel station debit from beginning up to now shown the daily debit from december till march in shafarood river in past years before harvesting had been monotonous and this variabilities had been from 2 to 3 m³ but this amount increased after harvesting years and it had been variable between 6 to 9 m² after 1978 (year) precipitation rate has decreased. This change was due to forest utilization which caused limitation area in forest. By evaluating after harvesting in shafarood basin water regime has got a regular link with precipitation regime, meanwhile with respect to forest utilization data, we can observed that in winter season maximum debit, high water volume and multi water in autumn. Therefore it is necessary to select a utilization method which could be appropriate with selected management method in the study basin.

Keywords: Utilization, Root, Runoff, Shafarood, Gilan
associated with discharge values. Finally, analysis of these relationships and increase or decrease in the amount of peak flood flow was determined and the necessary and practical suggestions were presented.

Results and discussion

Several factors such as rainfall, vegetation changes, physiographic and .... interfered in flowing water. In this field, the only factors that real change are utilization of forest cover and Rainfall that is not under human control. So coverage areas only factor that man can management and with appropriate management practices, control the water flowing.

Forest generally Homus sponge tissue store water. With harvesting coverage, maintaining and penetration rate groundwater storage decreased and flow regular is outside the hydrological sycle. In these areas water flow that occurs with percipitation, to form a temporary flood outside areas. Therefore, with forest utilization, the maximum instantaneous flow increase relate ago. In this case, the minimum flow rate and the average annual flow volume for reason increasing CN will be inverse relation with amount volume and number of trees harvested (Charts 3 and 4). Research Engler (1919) also reveals that in the region of low coverage and outer of forest, average maximum water flow is more than 2 times.

Diagram between rainfall in heavy rain months of years and debi discharge in before harvest years shows that with increase or decrease precipitation, the base flow changed, if the studies were taken after the operation from year 1979 although rainfall decreased than years ago but amount of the desired flow months has increased (Figure 1). Reason of it can be utilization of forest and decrease water infiltration in soil and lower evapotranspiration idue to exploitation.

Figure 3. The correlation between the number of trees harvested and the moment of maximum flow

Figure 4. The relationship between volume of trees harvested and the minimum flow area

Daily statistics Debi discharge in the months December to March in the years before the operation between 2 to 4 cubic meters has been variable, if this amount in the years after the 6 to 9 cubic meters has risen. The reason for this phenomenon is the utilization of the forest annually, especially in late autumn and winter season due to sleeping trees, the sap flow and thus the time rate of water infiltration decreases in soil.

Curve moving precipitation 2, 3 and 5 years (Figure 2) shows that amount of precipitation are decreased. Such interpretation can be given that the physiographic conditions and other parameters constant normal and rain than previous years have reduced. what factors may play an important role in increasing discharge. Answer this question is only one parameter that its unsuitable utilization and excessive of forest.

Comparison vegetation map (Figure 7) with flowing water potential map (Figure 8) show, most basin area are located in high potential areas that attack by a man.

Figure 5. Relationship between the level of forest degradation with maximum moment discharge

Figure 6. Relationship between the maximum discharge volume harvested

Investigate the relationship between low levels of forest with discharge using Form regression between reduction forest (126.2 ha) with discharge in the years harvest showed that reducing the level of the forest, discharge increased (Figure 5 and 6) and in Whereas if the trees afforest, be up to 12 years can not be expected that seedling hydrologic cycle able to intervene effectively. Therefore, it is necessary, that preserving existing forests and enriched with afforest in utilization and review management methods appropriate for the area to be applied. we use close to nature method, Because in this way always as dense masses and ages are available. Research and experience of other countries including Australia also shows that it is the best way to prevent flooding.

Figure 7. Vegetation Map of Shafarood

Figure 8. Zoning potential flood map of Shafarood

References

Aghazamani J (1990). afforest place in the country, forest and Rangeland magazine .No.6
Khanjani Shiraz B (1998). Comparison between biological and economic production and socio-economic effects of livestock production in the forest. The final report of the research project. Agriculture and Natural Resources Research Center, Guilan province.
Majnonyan H (1991), the trees and the environment. Publications Environmental Protection Agency.