**Referee 1**
**General Comments**

1- Although this methodology was done in different parts of world with different conditions previously, however no study has done on this methodology in Iran so far and this paper is new in Iran. Furthermore little study uses reservoir sediment to fingerprint sediment sources.

2- A catchment map and raw data added to the paper and Discussion was extended.

3- The introduction was revised and some new references added to this section.

**Specific comments**

4- **Page 6678, line 21:** The clear discrimination between the potential source materials provided by the source fingerprint properties, the relatively high levels of correct classification demonstrated by the stepwise discriminate function analysis and the limited divergence between the observed and predicted values for the sediment properties associated with individual sediment samples, demonstrated by the RME analysis and the low uncertainty amount, indicate that the source fingerprinting approach appears to work well in the study catchments and to generate reliable results.

5- **Page 6680, line 20:** Detailed catchment maps was added and figure 1 was referenced.

6- **Page 6681, lines 5 and 19**: we describe better the nature of the reservoirs and their sampling in the revised version.

7- **Page 6682, line 17:** we presented a raw data table including mean and standard deviation of materials collected from sediment source and reservoir sediments.

8- **Page 6683, line 15:** All of the 100 mixing models calculated in this study met the criterion was suggested by Walling and Collins (2000).

9- **Page 6685, line 1:** gullies mostly were located on material including evaporated marls that are susceptible to erosion specially gully erosion. However more explanation came in the revision.

10- **Page 6685, line 4:** the size of each geological formation or sediment sources within the catchment are presented in the paper as well as a new figure was added.

**11-** **Page 6685, line 22:** this sentence was changed according to referee comment.

12- **Page 6686:** The discussion was extended.

**Technical Corrections**

All technical corrections were done.

**Referee 2**
**General Comments**
1- Although the methodology was done in different parts of world with different conditions previously, however no study has done on this methodology in Iran so far and this paper is very new in Iran. Secondly in most of previous studies suspended sediment was used and a further problem associated with the sediment sampling procedures commonly used in suspended sediment is the need to obtain the collect of large volumes of water to sufficient dry mass of sediment and to permit analysis of a wide range of fingerprinting properties whereas the use of reservoir sediment in fingerprinting technique used in this research is a new idea that is free from these potential problems.
2- A catchment map and raw data added to the paper and Discussion was extended.
3- The introduction was revised and some new references added to this section.
4- The introduction presented shorter.
5- The map of catchment with more detail was added.


**Specific comments**
6- **Page 6680, lines 4-13:** References were updated.
7- **Page 6680, section 2.1. :** Sub-section 2.1 was converted in section 2. We provide detailed information in study area section and figure 1 in the revision.
8- **Page 6681, lines12-14.** Yes, samples collected from all around the catchment and 10 representative samples collected from all around each geological formation.
9- **Page 6681, line 12-14:** The sampling program started in Jun 2008 when reservoir sediments became relatively dry. We have no idea of temporal variability of source tracer values because rainfall-runoff events were completely random and we could not measured temporal variation. We think also in the case of reservoir we could not investigate temporal variation because the reservoir became full of water after each rainfall-runoff events and collection of samples were impossible. If we used suspended sediment instead of reservoir sediment, we would investigate this subject.
10- **Page 6681, lines 17:** 10 representative sediment samples were taken from different parts of each reservoir therefore 20 sediment samples were collected from two catchments overall. The reservoirs of catchments constructed earth embankments in 1993 to harvest seasonal runoff. These reservoirs have less 10 m deep. Sediments enter the reservoir by river system during winter and spring but they dry up in summer and fall. We think also that the material located next to the dams must be different than the material located in the inlet of the reservoir therefore collected 10 samples from different parts of reservoir sediments (near the dam axis, in the middle, side and at the inlet of the reservoir) but statistical results show no spatial variability inside the reservoir in both catchment. I think this subject is due to small area of reservoirs. in order to increase the representativeness of the individual samples 10 representative sediment samples were taken from different parts of each reservoir (near the dam axis, in the middle, side and at the inlet of the reservoir). The material was usually transported with winter and spring precipitations.
11- **Page 6681, section 2.5:** Yes we measured Particle size and organic matter correction factors. Particle size and organic matter content are associated with mixing model and exerts a strong influence upon the concentrations of many elements in soils and sediments and used in all of the previous works.
12- **Page 6681, line 25.** Selection of fingerprint properties for use in the investigation was based on previous experience of source discrimination in different parts of world not in the studied catchments. This approach was done for the first time in Iran.
13- **Page 6682, lines 23-24:** We use the stepwise method. We also provide more information about how we performed the discriminant function analysis in the revision.
14- **Page 6683, section 2.5:** The Mean Relative Error (MRE) statistic was frequently used to assess model performance in recent years (Walling et al, 2008; Collins et al, 2010). However in our research this statistic together with the clear discrimination between the potential source materials provided by the source fingerprint properties and the relatively high levels of correct classification demonstrated by the stepwise discriminate function analysis indicate that the source fingerprinting approach appears to work well and to generate reliable results.
15- **Page 6683, line 23:** It is gully walls.
16- **Page 6684, line 12-16:** We show averaged values with the associated standard deviation in the revision.

17- **Page 6697, Table 6:** It is important to recognize that a high contribution may not necessarily reflect a high contribution in terms of the actual mass of sediment, therefore it is important to take account of the proportions of the catchment area supplying these contributions.

18- **Page 6687, line 21-26:** we could not consider sediment particles reached the reservoir after different rainfall-runoff events the reservoir became full of water after each rainfall-runoff events and collection of samples was impossible. However we collected samples from materials transported from several events that show the mean condition of material transported.

19- **Page 6688; 2-3:** This sentence was changed according to referee comment.

**Technical Corrections**

All technical corrections were done.