Explanation of the relationship between the environmental risks and insurance of agricultural in the Golestan province

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Abstract
Agricultural section activities, due to largely depend on environmental conditions are associated with high risks. Existence of these risks becomes a barrier to the investment promotion in the agricultural section. The variable nature of instability and unpredictable natural phenomena has created special conditions for this section, as a result of this, agricultural productions and future farmers is mixed with uncertainties. One way to reduce the vulnerability of farmers is insured agricultural products and with regard to the goal of agricultural insurance, high risk areas should be given more support and identification of high risk areas will further contribute to the officials. The aim of this study was to identify high-risk areas of the Golestan province in terms of the risk of flooding, earthquakes, droughts, desertification, soil, erosion and landslides, and explained the relationship between these factors and the agricultural insurance in these areas. In this study the software Arc Gis to obtain the required layers have been used to analyze and calculations areas. In every part of the study first calculate the area of risk factors in the city and then insurance of agricultural productions on the arable land in the cities mentioned and relationship between these two factors is investigated , and finally , the total city`s risk is calculated and compared with the analysis if agricultural insurance . the risk survey of landslide in the provinces indicate a relationship to the insured agricultural products, dedication and the percentage of arable land is not considerable in this city, earthquake hazard zonation map shows that most of the southern slopes of the Eastern and Northern provinces are located in zones of high earthquake risk, But this case also no correlation between the severity of earthquake insurance agricultural productions in the province is not seen. The study of soil erosion hazard zonation map was found that a very small area of southern province is located in the zone of moderate risk, and much of the northern and north-western province located in high risk zone and central and western areas of the province is located in the very low risk zone. survey map of the creation of desert in the Golestan province show that southern parts province are located in the low risk zone and whatever we are close to the areas of the province in increasing dangers of the creation of desert , as northern province have been at the risk of the creation of desert . Evaluation of agricultural insurance in the creation of desert risk zones showed that Gonbad city is at high of the creation of desert and parallel to insure that the percentage of agricultural land in this city is remarkable, therefore there is a relationship between the risk of the creation of desert and land insurance. The drought hazard zonation maps suggest that the relative relationship between the risk of drought and agricultural land in the province are insured. The overall conclusion is that the present situation is only natural hazards related to climate change (the creation of desert and drought) is associated with agricultural products insurance.

Keyword: the agricultural products insurance, natural hazards, flood, landslide, earthquake, drought, the creation of desert.

Introduction
Golestan province located on the northern coastal strip and unaffected by moisture of the Caspian sea and Alborz troll and climate favorable agricultural potential is very high and a significant amount of the country's annual agricultural productions is accounted which unfortunately due to risks such as flood , droughts , landslides , storms , frost and et cetera . Farmers be larger suffering losses, and despite all the advances in the science and technology the human still angry about nature and the disasters and catastrophes. Events and disasters still surprise humans and despite all human efforts is not yet control of their destiny and overcome unexpected events[4]. Amount of damages and losses due to the crisis or incident directly associated with vulnerability and damage he causes a lot of human activity. Position of our country what comments the earthquake and what comments the changes in the precipitation and phenomena resulting from this has been disturbing and, is known as the word's tenth most natural disaster-prone country. One way to compensate the damage caused by natural factors on farmers is insurance agricultural products. In theory, the farmers in the high risk areas are more likely than insurance agricultural products[5].
But due to risk aversion and insurance companies incur losses, are they avoid from the activity of these high risk areas? The expected to increase the risk of agricultural products insurance are increased.

Needs and research objectives
Golestan province is located on Alborz fault path that this caused several earthquakes in the province, and also because of the weather showery rain in the warm season annual flood losses to formers to inter. Golestan province on the north by the deserts of Turkmenistan and unfortunately these get reactivation affected province have escalated. The climate change in a different manner that drought is caused by reduced rainfall threshold, these causes a lot of damage to human activity takes and agriculture as a factor that has a direct relationship with nature is more effective than the normal risk factors. To this purpose in 1363 government with the goal of compensation arising from natural hazards, social, and etch on the farmers and to help them agricultural products insurance began and thus could be provide additional support to farmers[7]. According to the objective agricultural insurance high risk areas should be given more support and identify high-risk zones to the authorities will further help in this area. The aim of this study was to identify areas of high risk from floods, earthquakes, droughts, desertification, soil erosion and land and agricultural products insurance in these areas and

explain the relationship between these factors and agricultural insurance.

Studying area, materials and methods

Studying area; according to statistics 1381 the Golestan province 20437.74 square kilometer and based on the statics 1386 with area 20380.7 square kilometer almost one third percent of the total area of the country is allocated. As you know that the Golestan province in located in the geographic range 54° 56' east longitude and 36° 38' north latitude, and between the provinces of Mazandaran, Semnan and the north of Khorasan (figure 1). Most of the province has a mild Mediterranean climate, but Gorgan plains in terms of proximity to the Turkmenistan desert and decreasing altitude has a climate semi-desert and hot. The province population according to the census of 1385 was 1617087 people in the country and based on the population and housing census is 17777014 people in the country that this population is one third percent of the total population of the country is considered. Economically, agricultural, is the main axis of the activities people of the Golestan province that ranching, fisheries and agriculture processing industries are also thriving in it.

Materials and methods

This study done with the descriptive analysis method and in order to achieve the result has been used from the following data:

- The map landslide areas of the Golestan province
- The map 24-year drought in the Golestan province
- Zonation map of the erosion in the Golestan province at a scale of 1:100000.
- Zonation map of the creation of desert in the Golestan province at a scale 1:100000.
- Zonation map of the earthquake in the Golestan province.
- Zonation map of the flood in the Golestan province.
- Statistics insurance agricultural products divided into cities in the Golestan province in the crop year 1389-90.
- Statistics of arable land in the Golestan province divided into cities of this province.

In this study the software Arc Gis to obtain the required layers have been used in order to analyze and calculation area .in the every part of the study first the area of risk is calculated in each city and then insurance of agricultural products in arable land of this cities and the relationship between these two factors was studied . Finally, the total risk is calculated in each city and was analyzed in comparison with agricultural insurance.

Relationship between the risk factors with agricultural insurance

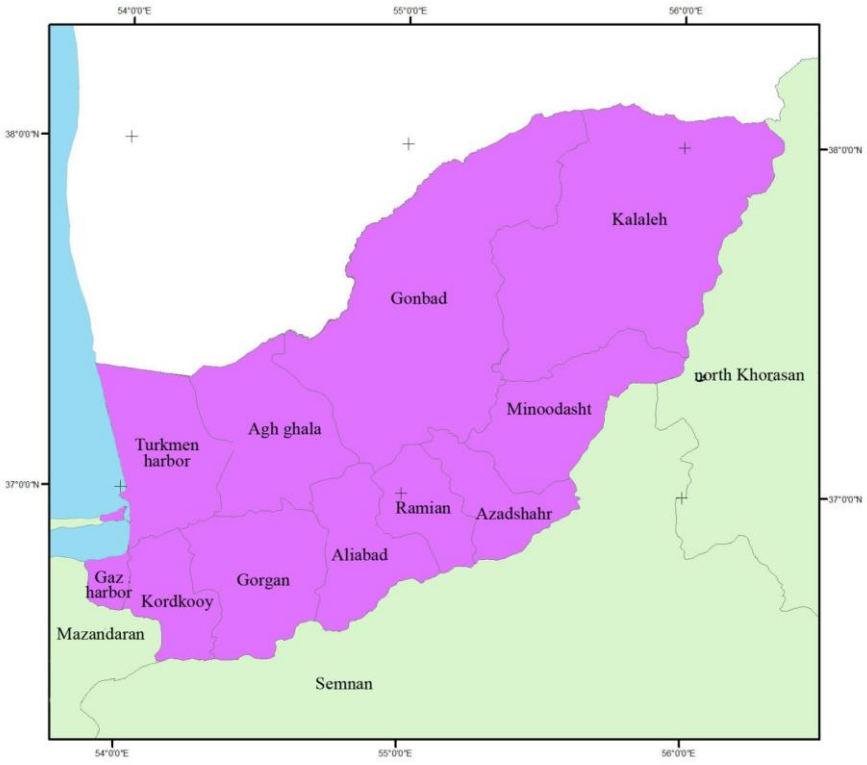

Figure. 1 location map of the Golestan[3]

Table 1.The percentage of the insured's land surface as well as the percentage of arable land in every city is shown

Table 1: insurance status in the cities of the Golestan province

Percentage insured to the arable lands	Percentage insured land to the total province	Insured lands surface (hectors)	Arable lands surface (hectors)	city
5.82	1.25	2213	37971	Azadshahr
11.12	1.24	2200	19777	Agh ghala
96.01	6.11	10898	11350	Turkmen harbor
6.23	2.34	4182	67027	Ramian
5.71	2.03	3620	63301	Aliabad
10.16	3.55	6350	62488	Minoodasht
71.17	34.24	61137	85896	Gonbede ghaboos
10.93	6.04	10789	98626	Kalaleh
53.72	39.21	70016	130328	Gorgan
11.07	2.71	4845	46762	Kordkooy
20.43	1.28	2286	11185	Gaz harbor
-	100	178536	631711	total

Source: Golestan farmers' insurance fund[1]

Based on the information that obtained from the Golestan agricultural insurance fund the Turkmen harbor city has the highest insurance percentage of arable land (96.07%) and Gonbad and Gorgan cities with 71.17% and 53072% respectively are in the rankings next . Turkmen harbor city because some of the lands is arable area has the highest proportion of the land surface is arable land insured and level of insurance of this city in general is a significant. In Gonbad and Gorgan cities, this can be due to having more opportunities insurance in the two cities. We will continue to investigate the risk factors and agricultural insurance.

Investigate the relationship between the landslides with agricultural insurance

Landslide hazard zonation map of the province (figure 2) show that about 14% of the province area is landslide hazard with too high risk, 30% with high risk, 29% with moderate risk, 18.35% with low risk, and 7.88% is with too low risk. Relative area of the risk of landslide in the level cities also shows that Azadshahr city has the highest risk of landslide at the provincial level.

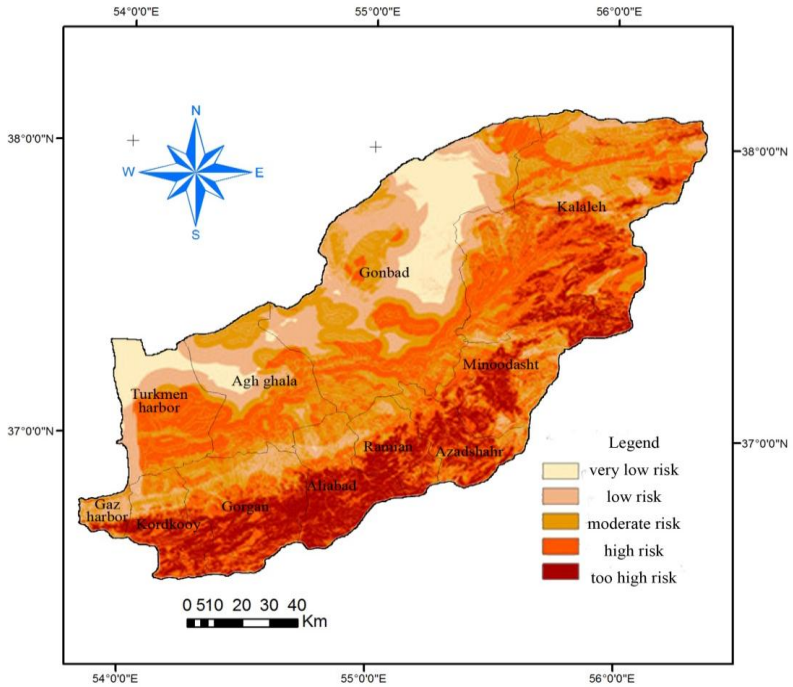

Figure. 2 landslide hazard zonation in the Golestan province[3]

Landslide hazard zones in table 1 and 2 represent the rural household and the population in terms of placed in position of the landslide hazard and the table 3 represent the status of each of the cities in the term of the landslide hazard.

Table 2: The percentage and floor areas in the landslide zonation map

Relative area(percentage)	Area(hector)	risk areas	row
7.88	154192.41	Very low risk area	1
17.53	362700.99	low risk area	2
29.05	567501.74	Moderate risk area	3
30.36	594061.29	High risk area	4
14.16	277225.74	Too high risk area	5

Table 3: Abundance and relative abundance of villages, number of household and rural population in term of the landslide in Golestan province

Landslide area in the every city (percentage)	Landslide area(hectors)	Risk category	City area	city
30.30 39.10	26551.33 34263.43	Too high risk High risk	87624.56	Azadshahr
26.88 36.18	47671.97 64166.62	Too high risk High risk	177343.68	Agh ghala
9.52 10.63	2235.13 2494.55	Too high risk High risk	23464.70	Gaz harbor
33.42	51315.92	High risk	153520.20	Turkmen harbor
30.24 30.51	23595.53 23803.61	Too high risk High risk	78002.06	Ramian
47.77 21.06	55098.31 24410.02	Too high risk High risk	115321.36	Aliabad
34.38 31.55	2823.033 25913.64	Too high risk High risk	82110.14	Kordkooy
7.95 38.06	39641.54	Too high risk High risk	498560.10	Kalaleh
34 30.09	54935.21 48622.98	Too high risk High risk	16153.59	Gorgan
0.01 17.33	50.88 87716.11	Too high risk High risk	505860.44	Gonbede ghaboos
30.28 36.04	47966.05 57095.66	Too high risk High risk	158391.74	Minoodasht

Table 4: area and relative area of the landslide in term of every city

Number population		Number household		Number village		landslide Risks category
Percentage	Abundance	Percentage	Abundance	Percentage	Abundance	
0.67	5629	0.59	880	0.51	4	Very low risk
14.67	123742	15.47	22963	13.35	111	low risk
43.42	361307	44	65306	38.93	301	Moderate risk
38.65	321663	37.62	55839	38.93	301	High risk
2.37	19746	2.31	4331	7.24	56	Too high risk

The following table indicates the landslide hazard ratio of every city to it’s the arable land insurance.

Table 5: landslide hazard ratio of every city to the arable land insurance

Percent insurance to the arable lands	Percent stake in the city	Risk category	city
5.83	30.30 39.10	Too high risk High risk	Azadshahr
11.12	26.88 36.18	Too high risk High risk	Agh ghala
20.43	9.52 10.63	Too high risk High risk	Gaz harbor
96.01	33.42	High risk	Turkmen harbor
6.23	30.24 30.51	Too high risk High risk	Ramian
5.71	47.77 21.16	Too high risk High risk	Aliabad
11.07	34.38 31.55	Too high risk High risk	Kordkooy
10.93	7.95 38.06	Too high risk High risk	Kalaleh
53.72	34 30.09	Too high risk High risk	Gorgan
71.17	0.01 17.33	Too high risk High risk	Gonbede ghaboos
10.16	30.28 36.04	Too high risk High risk	Minoodasht

As can be seen in the table Azadshahr city has the highest risk of landslide in the province (3.3% too high risk and 39.1% high risk), but small percentage of the arable land in this city is covered by insurance (5.82). Thus cannot be imagining between these factors and the risk of agricultural products insurance at the cities of Golestan province.

Evaluation of the earthquake risk relationship with agricultural insurance

The earthquake hazard zonation maps indicate that most earthquake occurred on the southern slopes of the north western province and located 1.5% of surface province in the too high risk area, 31.4% of surface province in the high risk area, 51.84% of surface province in the moderate risk area and 15.19% of surface province in the low risk area that table 7 indicates the status of the rural areas cities in term of exposure to the earthquake.

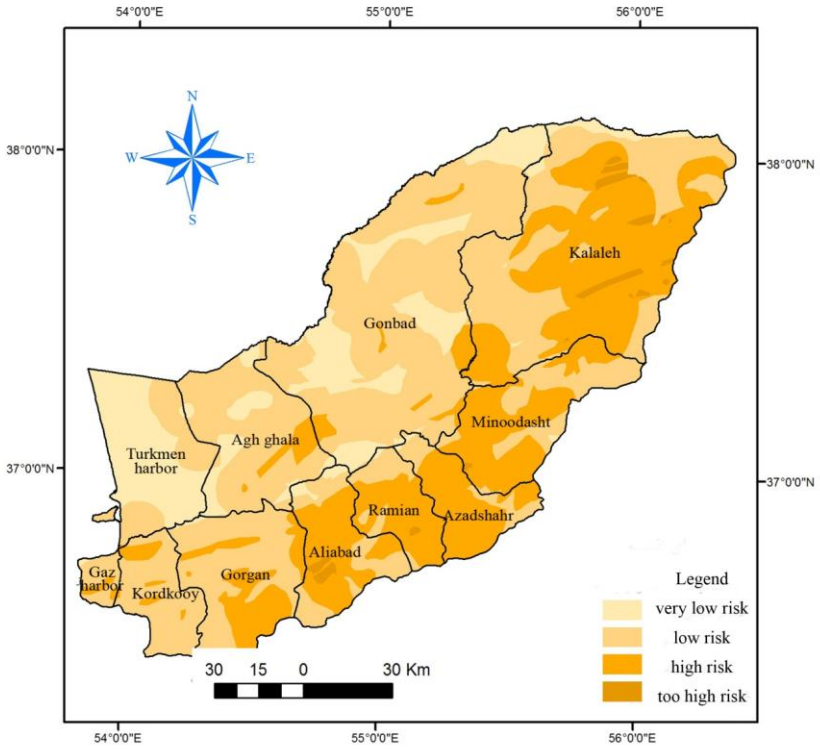

Figure. 3 the earthquake hazard zonation in the Golestan province[3]

Table 6: The percentage and classes' in the area of the earthquake zonation map

Relative area (percent)	Area (hectors)	Risk areas	row
1.50	30723.3	Very low risk area	1
31.45	640688.13	low risk area	2
51.84	1055856.87	Moderate risk area	3
15.19	309389.22	High risk area	4

Table 7: abundance and relative abundance of villages, number of household and rural population in term of the earthquake in the province area

Number population		Number household		Number village		earthquake Risk category
Percentage	Abundance	Percentage	Abundance	Percentage	Abundance	
1.42	11859	1.45	2160	1.68	13	Very low risk area
36.52	304858	37.5	55843	41.9	324	low risk area
52.31	436619	52.2	77722	47.47	367	Moderate risk area
9.73	81264	8.82	13132	8.9	69	High risk area

Table 8: area and relative area of earthquake in term of every city

Earthquake area in the every city (percent)	*earthquake area (hectors)*	Risk category	*City area*	city
1.74 69.49	1525.94 60890.69	Too high risk High risk	87624.56	Azadshahr
0.07 7.8	127.41 13836.04	Too high risk High risk	177343.68	Agh ghala
23.27	5662.53	High risk	23464.70	Gaz harbor
0.00	3.33	High risk	153520.20	Turkmen harbor
2.86 64.68	2232.72 504.59	Too high risk High risk	78002.06	Ramian
4.79 56.63	5533.92 65312.35	Too high risk High risk	115320.36	Aliabad
14.14	11610.73	High risk	82110.14	Kordkooy
3.52 49.68	17554.58 247711.94	Too high risk High risk	498560.10	Kalaleh
0.82 35.54	1354.98 57421.03	Too high risk High risk	161563.59	Gorgan
0.03 5.42	157.41 27425.86	Too high risk High risk	505860.44	Gonbede ghaboos
1.18 61.04	1871.13 96689.82	Too high risk High risk	158391.74	Minoodasht

Table 9: ratio of the earthquake risk for every city to the arable land insurance

Percent insurance to the arable lands	Percent stake in the city	Risk category	city
5.83	1.74 69.49	Too high risk High risk	Azadshahr
11.12	0.07 7.8	Too high risk High risk	Agh ghala
20.43	23.27	High risk	Gaz harbor
96.01	0.00	High risk	Turkmen harbor
6.23	2.86 64.68	Too high risk High risk	Ramian
5.71	4.79 56.63	Too high risk High risk	Aliabad
11.07	14.14	High risk	Kordkooy
10.93	3.52 49.68	Too high risk High risk	Kalaleh
53.72	0.82 35.54	Too high risk High risk	Gorgan
71.17	0.03 5.42	Too high risk High risk	Gonbede ghaboos
10.16	1.18 61.04	Too high risk High risk	Minoodasht

As you can seen in the table 9 Azadshahr city again as the most dangerous city in terms of the earthquake is determined (1.74% to high risk and 69.49% high risk), but as mentioned above, this city has a small percentage of arable land insurance in 1389-90 that this issue indicates that the neglect of the agricultural lands of the earthquake risk in the insurance and low relationship between these two factors.

Investigation the relationship between the flood and agricultural insurance

The result of the flooding hazard zonation map based on the coefficient of flooding in the province is provided with a return period of 25 years indicated that average coefficient of flooding 25 years period is 1.71 year and maximum of this is 3 years.

According to the zonation map can be seen that 14.5% of the province area is located in the too high risk area, 18.20% of the province area is located in the high risk area, 19.22% of the province area is located in the moderate risk area, and 28.63% in the low risk area and 19.42% in the very low risk area are located.

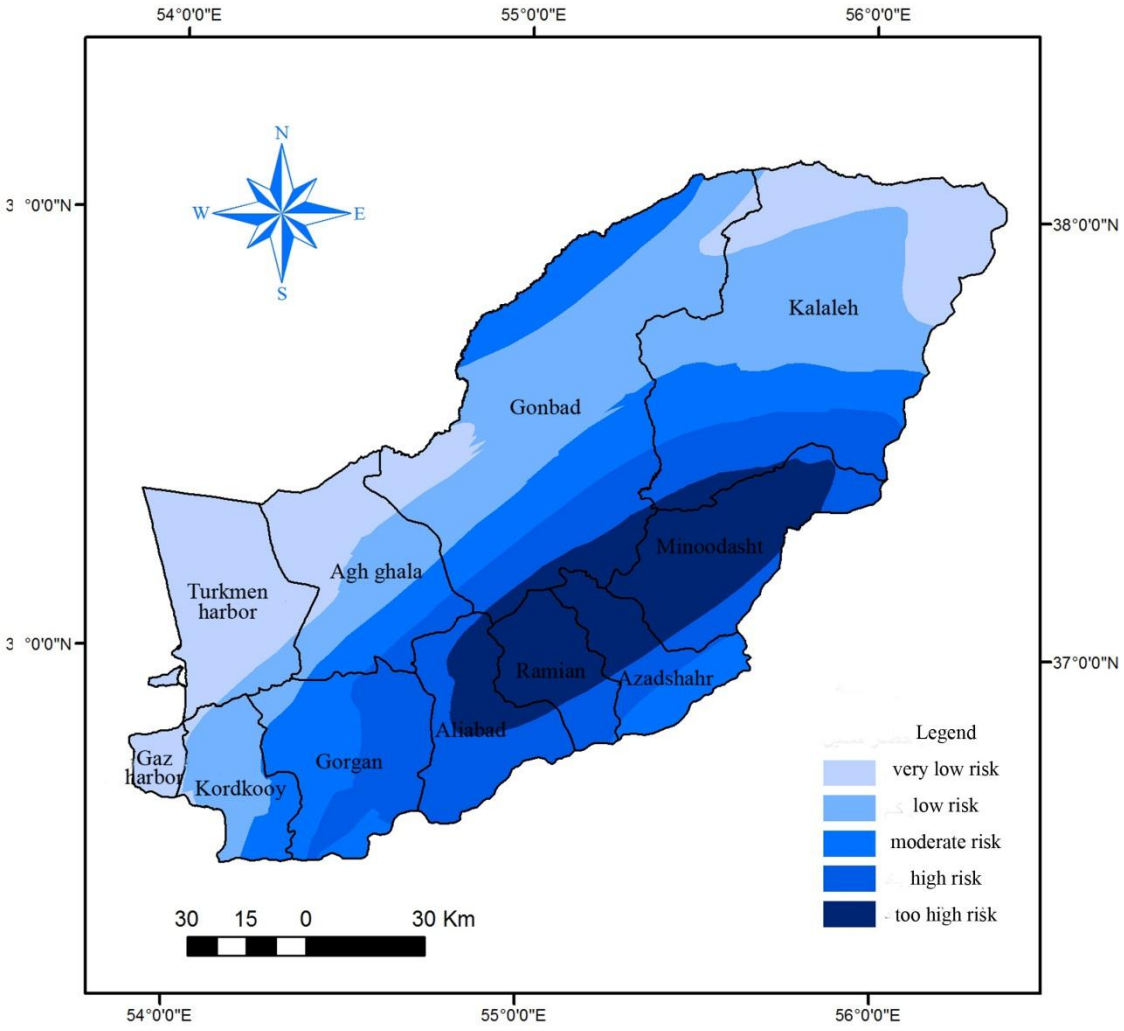

Figure. 4 The flood hazard Zonation in the Golestan province[3]

Table 10: The percentage and classes' in the area of the flood zonation map

Relative area(percent)	Area(hector)	Risk area	row
19.42	395829.99	Very low risk area	1
28.63	583625.25	low risk area	2
19.22	391668.21	Moderate risk area	3
18.20	371006.73	High risk area	4
14.50	295671.87	Too high risk area	5

Table 11: abundance and relative abundance of villages, number of the household and rural population in term of the flood in the province area

Number population		Number household		Number village		Flood Risk category
Abundance	Percentage	Abundance	Abundance	Percentage	Abundance	
9.11	76.04	8.91	13269	9.57	74	Very low risk
15.48	129243	15.43	22982	15.52	120	low risk
16.89	140999	16.84	25071	21.21	164	Moderate risk
28.41	237193	28.22	42009	25.87	200	High risk
30.08	251121	30.58	15526	27.81	215	Too high risk

Table 12: area and relative area of the flood in term of every city

Flood area in the every city (percent)	Flood area (hector)	Risk category	Area city	city
41.34 22.81	36228.67 19987.84	Too high risk High risk	87624.56	Azadshahr
8.82	15648.06	High risk	177343.68	Agh ghala
76.78 21.64	59894.90 16879.90	Too high risk High risk	78002.06	Ramian
39.83 57.02	45944.22 65470.78	Too high risk High risk	115321.36	Aliabad
1.40 13.62	6992.91 67933.56	Too high risk High risk	498560.10	Kalaleh
0.03 52.08	58.72 84155.11	Too high risk High risk	161563.59	Gorgan
5.33 12.05	26986.88 60999.56	Too high risk High risk	505860.44	Gonbede ghaboos
75.39 23.65	119414.93 37470.42	Too high risk High risk	158391.74	Minoodasht

Table 13: ratio of the risk flood for every city to the arable land insurance

Percent insurance to the arable lands	Percent stake in the city	Risk category	city
5.83	41.34 22.81	Too high risk High risk	Azadshahr
11.12	8.82	High risk	Agh ghala
6.23	76.78 21.64	Too high risk High risk	Ramian
5.71	39.83 57.02	Too high risk High risk	Aliabad
10.93	1.4 13.62	Too high risk High risk	Kalaleh
53.72	0.03 52.08	Too high risk High risk	Gorgan
71.17	5.33 12.05	Too high risk High risk	Gonbede ghaboos
10.16	75.39 23.65	Too high risk High risk	Minoodasht

In the above table it can be seen that the highest risk of flooding is in the Ramian city (76.78% too high risk , 21.62% high risk), But in term of the agricultural product insurance in the able land this city not have very interesting status (6.23% insurance in the able lands), the Minoodasht city is also in the second place (75.39% to high risk , 23.65% high risk), but also this city in terms of the agricultural product insurance not have very interesting status.

Investigate the relationship between the soil erosion and agricultural insurance

The soil erosion hazard indicated that 38.59% of surface province located in the very low risk area , 4.81% of surface province located in the low area , 39.23% located in the moderate risk area , 16.73% located in the high risk area and 0.38% located in the too high risk area . Table 15 indicates the frequency of rural population is at risk of erosion intensity. According to table 16 the cities Aghghala, Turkmen harbor, Gaz harbor and Ramian are without the high and very high erosion risk.

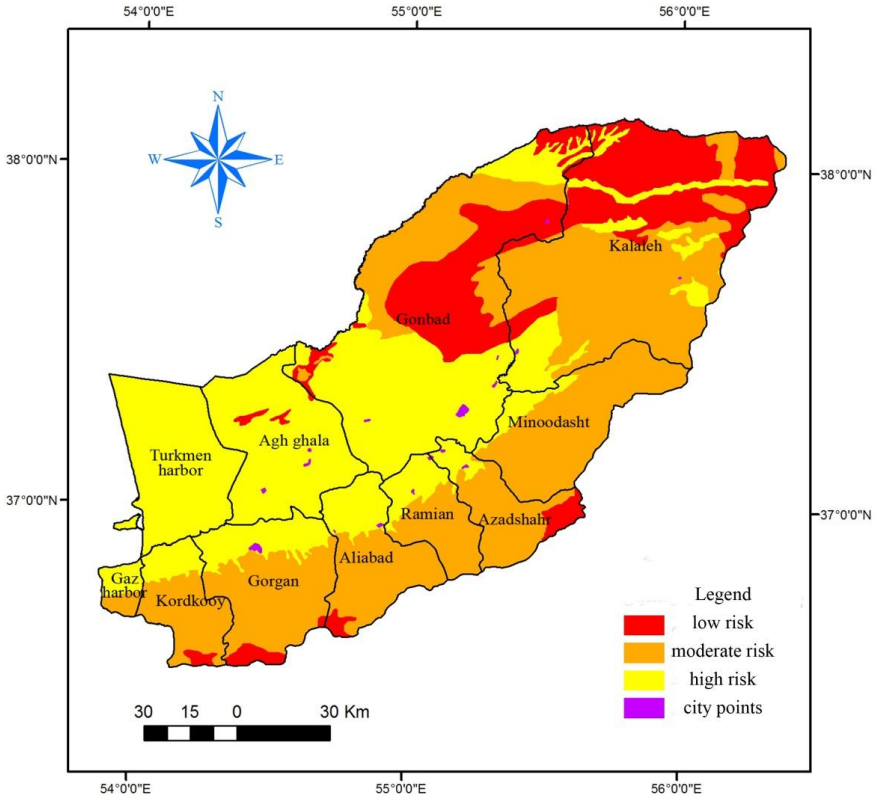

Figure. 5 The soil erosion hazard zonation in the Golestan province[3]

Table 14: The percentage and classes' in the area of the soil erosion zonation map

Number population		Number household		Number village		*Erosion* Risk category
Abundance	Percentage	Abundance	Abundance	Percentage	Abundance	
22.76	604636	74.14	107945	61.74	468	Very low risk
1.13	9279	1.05	1530	1.84	14	low risk
21.51	175251	21.8	31737	32.18	244	Moderate risk
3.04	24776	2.90	4226	4.08	31	High risk
0.1	671	0.11	144	0.16	1	Too high risk

Table 15: abundance and relative abundance of villages, number of the household and rural population in term of the soil erosion in the province area

Erosion area in the every city (percent)	*Erosion area (hector)*	Risk category	Area city	city
13.21	11582.45	Too high risk	87624.56	Azadshahr
1.28	1486.88	High risk	115321.36	Aliabad
3.16	2597.75	Too high risk	82110.14	Kordkooy
35.34	176194.38	High risk	498560.10	Kalaleh
2.56 0.61	4150.95 988.33	Too high risk High risk	161563.59	Gorgan
28.63	144851.91	High risk	505860.44	Gonbede ghaboos
1.92	3053.83	High risk	158391.74	Minoodasht

Table 16: area and relative area of the soil erosion in term of every city

Percent insurance to the arable lands	Percent stake in the city	Risk category	city
5.82	13.21	Too high risk	Azadshahr
11.12	1.28	High risk	Aliabad
5.71	3.16	Too high risk	Kordkooy
10.93	35.34	High risk	Kalaleh
53.72	2.56 0.61	Too high risk High risk	Gorgan
71.17	28.63	High risk	Gonbede ghaboos
10.16	1.92	High risk	Minoodasht

Table 17: ratio of the soil erosion risk for every city to the arable land insurance

Relative area(percentage)	Area(hector)	risk areas	row
38.59	785938.08	Very low risk area	1
4.81	98120.05	low risk area	2
39.23	798883.96	Moderate risk area	3
16.73	340859.86	High risk area	4
0.38	7874.22	Too high risk area	5
0.02	482.70	Gorgan golf	6
0.20	4216.53	City points	7

According to the above tables, Kalaleh city is located in the too much danger zone and with 35.34% have a highest risk of soil erosion in the province while the percentage of arable land insurance for this city is 10.93% and this is the seventh city of this respect, thus requires in this city pay more attention to the agricultural insurance and at percent the close association between the risk of soil erosion and agricultural and insurance in the province not observed.

Investigate the relationship between the risks of the creation of desert with agricultural insurance

Zonation map of the creation of desert risk indicated that 43.93% of the province surface in terms of the creation of desert risk is located in the very low risk area, 1.5% of the province surface is located in the low risk area, 19.23% is located in the moderate risk area, 20.23% is located in the high risk area and 14.96% of the province surface is located in the too high risk area. Table 19 represents the villages and population is at the risk of the creation of desert. Also on the table 20 Azadshahr, Gaz harbor, Ramian, Aliabad, kordkoy, Gorgan and Minoodasht cities are without risk of the creation of desert.

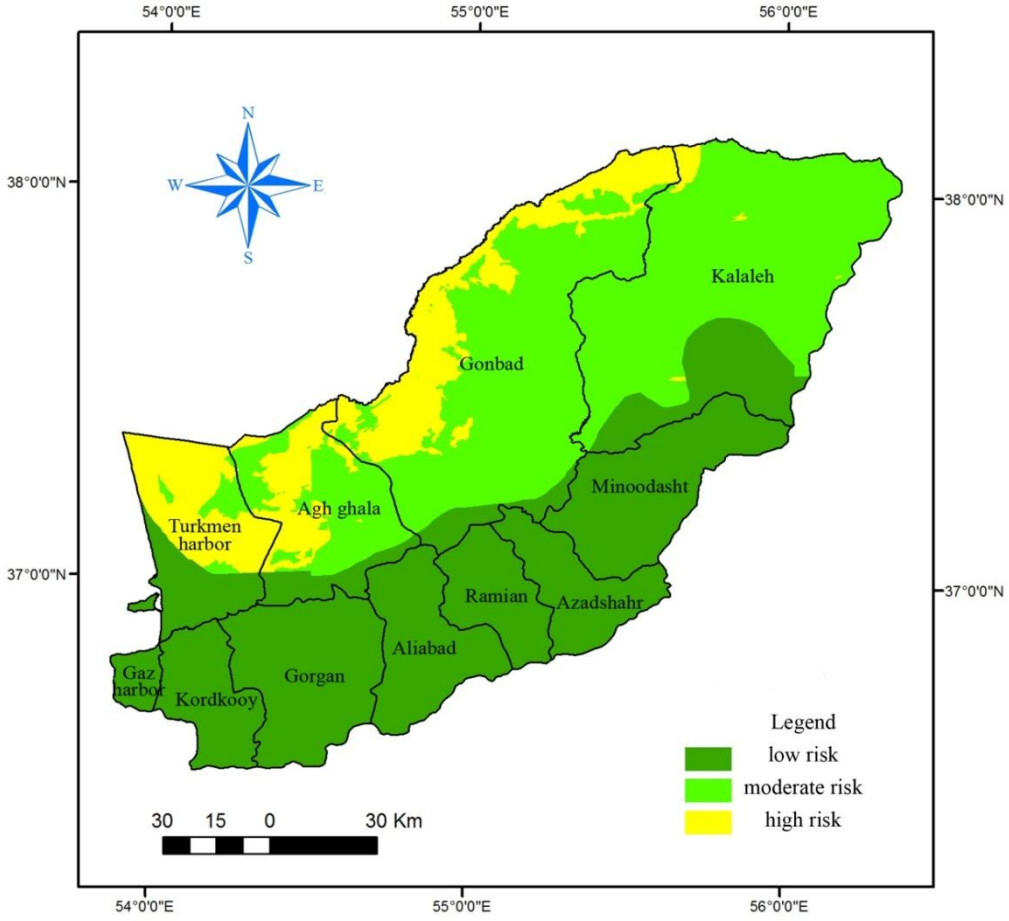

Figure. 6 zonation of the creation of desert risk in the Golestan province[3]

Table 18: The percentage and classes area in the zonation map of the creation of desert

Relative area(percentage)	Area(hector)	risk areas	row
43.93	89136.88	Very low risk area	1
1.53	31308.97	low risk area	2
19.23	391824.61	Moderate risk area	3
20.33	414275.99	High risk area	4
14.96	304893.05	Too high risk area	5

Table 19: abundance and relative abundance of the villages, number of the household and rural population in term of the creation of desert in the province surface

Number population		Number household		Number village		*desertification* Risk category
Abundance	Percentage	Abundance	Abundance	Percentage	Abundance	
71.88	599988	74.81	111361	67.39	521	Very low risk
4.45	37170	4.06	6050	3.23	25	low risk
17.19	143510	15.35	22857	20.82	161	Moderate risk
4.86	40605	4.35	6483	5.56	43	High risk
1.59	13327	1.41	2106	2.97	23	Too high risk

Table 20: area and relative area of the creation of desert in term of every city

Desertification area in the every city(percent)	*Desertification area (hector)*	Risk category	City area	city
32.23 12.93	57167.02 22937.73	Too high risk High risk	177343.68	Agh ghala
55.51 8.06	85222.81 12383.53	Too high risk High risk	153520.20	Turkmen harbor
1.82 39.05	9119.33 194709.94	Too high risk High risk	498560.10	Kalaleh
29.65 36.15	150000.95 182910.76	Too high risk High risk	505860.44	Gonbede ghaboos

Table 21: ratio of the creation of desert risk for every city to the arable land insurance

Percent insurance to the arable lands	Percent stake in the city	Risk category	City
11.12	32.23 12.93	Too high risk High risk	Agh ghala
96.01	55.51 8.06	Too high risk High risk	Turkmen harbor
10.93	1.82 39.05	Too high risk High risk	Kalaleh
71.17	29.65 36.15	Too high risk High risk	Gonbede ghaboos

According to the table 21 Gonbad city with 29.65% surface is located in the too high risk area and with 36.15% surface is located in the high risk area have the greatest risk of the creation of desert and in terms of the arable lands insurance at the province (71.17% insurance in the arable lands) have the greatest percentage of the agricultural products insurance. In the second rank in terms of the creation of desert risk, Turkmen harbor city is with 55.51% too high risk and 8.06% high risk. This city with 96.01% has the greatest percentage of the arable land insurance that this was largely due to a lack of arable land in this city is because of the spread of the creation of desert, thus it can be stated that there is a high relationship between the agricultural products insurance and lands under threat of the creation of desert.

Investigate the relationship between the drought risks with the agricultural insurance

Drought zonation map has been prepared on the basis of monthly 24 rainfall in the province implies that 12.50% of the province surface if located in the too high risk area, 52.62% of the province surface is located in the high risk area, 22.25% of the province surface is located in the low risk area and 13.63% of the province surface is located in the very low risk area. Table 23 indicates that the frequency of the drought vulnerable villages in the province. Based on this table 169 villages are located in the too high risk area, 545 villages are located in the high risk, 195 villages are located in the low risk area and 102 villages are located in the very low risk area. As can be seen in many villages (714) are located in the high or very high risk area, thus the Golestan province is facing a severe drought risk (at the study time) that this is required measures to reduce the damage caused by it.

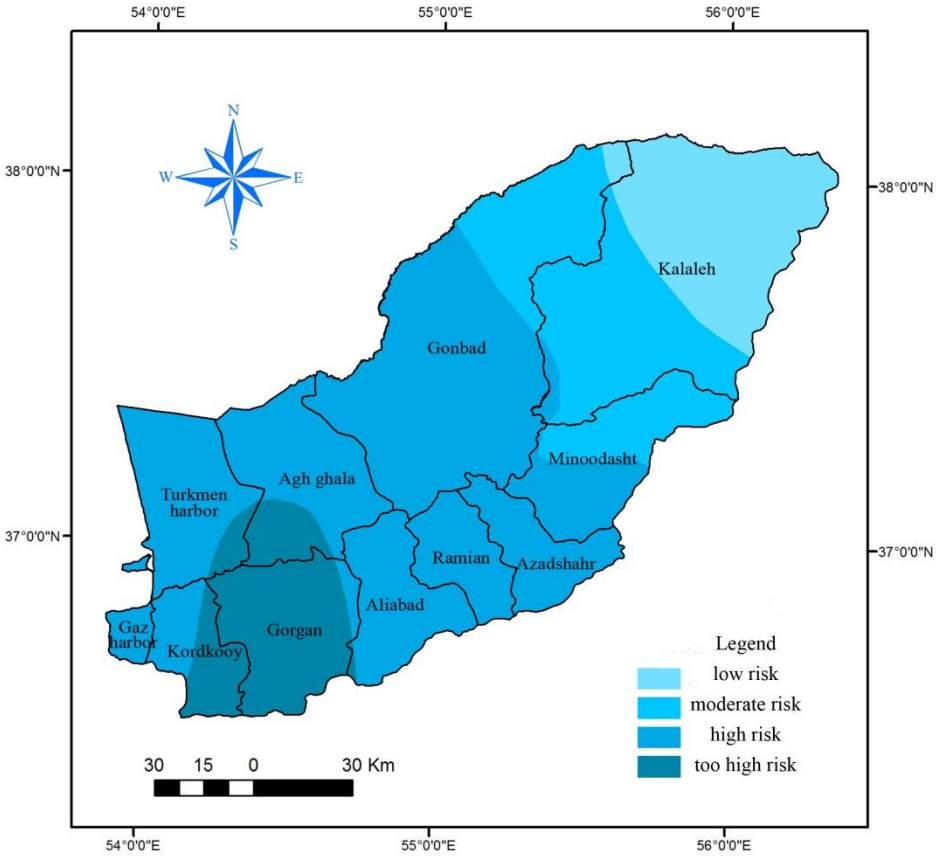

Figure. 7 The drought hazard zonation in the Golestan province[3]

Table 22: The percentage and classes' area and number the household in the zonation map of the drought

Number village		Relative area (percent)	Area (hector)	Risk area	row
Percentage	Abundance				
16.72	169	13.63	278183.02	Very low risk area	1
53.91	545	21.25	433610.88	low risk area	2
19.29	195	52.62	1073882.97	High risk area	3
10.08	102	12.50	255304.42	Too high risk area	4

Table 23: area and relative area for drought in terms of the every city

Drought area in the every city (percent)	*Drought area (hector)*	Risk category	City area	city
100	87624.56	High risk	87624.56	Azadshahr
21.98 78.02	38911.15 137526.58	Too high risk High risk	177343.68	Agh ghala
100	23464.7	High risk	23464.7	Gaz harbor
9.98 90.02	15329.66 142389.65	Too high risk High risk	153520.2	Turkmen harbor
100	78002.06	High risk	78002.06	Ramian
98.02 1.98	114191.27 1883.46	Too high risk High risk	115321.36	Aliabad
56.04 43.6	46217.52 35717.7	Too high risk High risk	82110.14	Kordkooy
2.03	10143.35	High risk	498560.10	Kalaleh
94.67 5.32	152962.60 8696.51	Too high risk High risk	161563.59	Gorgan
72.61	367335.81	High risk	505860.44	Gonbede ghaboos
45.65	72310.97	High risk	158391.74	Minoodasht

Table 24: ratio of the risk drought for every city to the arable land insurance

Percent insurance to the arable lands	Percent stake in the city	Risk category	city
5.82	100	High risk	Azadshahr
11.12	21.98 78.02	Too high risk High risk	Agh ghala
20.43	100	High risk	Gaz harbor
96.01	9.98 90.02	Too high risk High risk	Turkmen harbor
6.23	100	High risk	Ramian
5.71	98.02 1.98	Too high risk High risk	Aliabad
11.07	56.04 43.6	Too high risk High risk	Kordkooy
10.93	2.03	High risk	Kalaleh
53.72	94.67 5.32	Too high risk High risk	Gorgan
71.17	72.61	High risk	Gonbede ghaboos
10.16	45.65	High risk	Minoodasht

As can be seen in table 25, Gorgan city with 94.67% of the too high risk area and 5.32% of the high risk area has been with the area test on terms of the drought factor in the province, also in this city in the carp year 1389-90, 53.13% of the arable land in this city has been covered by agricultural insurance.
Thus, the high of the drought in this city has a positive effect on the proportion of cultivated land covered by insurance.

Pluralization and conclusion

By examining the landslide risk in the province determined that most of the villages are widely moderate landslide risk, but as noted, landslide has little relationship with the agricultural products insurance so that the Azadshahr city has the greatest danger of landslide its arable land is not consideration. Therefore in order to the losses incurred to the villagers and farmers located in the high risk limits in terms of the landslide should be paying more attention to agricultural products insurance in these areas. Most earthquakes have occurred on the southern slopes of the north eastern ,

earthquake hazard zonation map shows that most of the southern slopes of the eastern province are located in the high risk earthquake zone , but in this case also no correlation between severity of the earthquake insurance and increase agricultural production in the province is not seen, so that again Azadshahr city has the greatest high in this field (more than 50%) but the arable land insured in this city lower than the other cities. So the evaluation of the earthquake risk to the population level shows that the most of villages are located at average and high earthquake risk. The existence number of villages in the middle to high risk area should be considered agricultural fund administrator to more level of the arable lands in this area to be covered by agricultural insurance.

Evaluation of the soil erosion hazard zonation map has been suggested that a very small area of southern province is located in the moderate risk zone, and much of the northern and north western province is located in the high risk zone and central and west zones are located in the very low risk area. In terms of the erosion hazard only one village with 144 household and 671 populations at the too much risk. And in the all cities relative small, they are at the too high and high risk, however, in this case there is little relationship between products insurance and erosion risk, but since it has lower risk factor in the occurrence of this error is negligible. In terms of map of the creation of desert risk the southern parts of the province are located in the low-risk zones and whatever we get close to the northern areas of the province the risk of the creation of desert will be increase so that the northern province have been at the risk the creation of desert and 23 villages with 13327 population are located at the creation of desert hazard.

Evaluation of agricultural products insurance in the risk zones the creation of desert show that the Gonbad city is located in the serious desertification hazard (more than 50% city surface) and parallel to the agricultural products insurance in this city in the corps year 1389_90 show remarkable percent, thus can be concluded that there is a relationship between the creation of desert and the agricultural products insurance. Also the drought hazard zonation map has been prepared in the period of 24 month indicated that the northwestern of the province during this period are located in the low risk area and the south-eastern of the province is located at the high and very high risk, this is because during this period of the rainfall in the south east has been much less than the drought risk threshold. Based on the risk map of drought the numerous villages in the province , 714 villages of 1011 village have been at the high and very high risk and Gorgan city with 94.67% very high risk area and 5.32% high risk area has the highest risk of drought in during the statistical period .

Also , 53.72% of the arable land in this city in during the corps year 1389-90 covered by the agricultural insurance that can be state that there is a relative relationship between the drought hazard and the agricultural land insurance in the province .

According to the above remarks it follows that in the present only the natural hazards are to climate change related to the agricultural lands insurance. As we watched that the table below the percentage of total risk too higher for any city in the area of natural hazards insurance precedent arable land in each city is presented. Then in this way the total ration of natural risks and the agricultural insurance to be evaluated.

Table 25: ratio of the environmental hazards in the cities of the Golestan province

Drought	Desertification	Soil erosion	flood	Earthquake	Landslide	city
100	0.00	13.21	64.15	71.23	69.4	Azadshahr
100	45.16	0.00	8.82	7.87	63.06	Agh ghala
100	0.00	0.00	0.00	23.27	20.15	Gaz harbor
100	63.57	0.00	0.00	0.00	33.42	Turkmen harbor
100	0.00	0.00	98.42	67.54	60.75	Ramian
100	0.00	1.28	96.85	61.42	68.93	Aliabad
100	0.00	3.16	0.00	14.14	65.93	Kordkooy
2.03	40.87	35.34	15.02	53.2	46.01	Kalaleh
100	0.00	3.17	52.11	36.37	64.09	Gorgan
72.61	65.8	28.63	17.35	5.45	17.34	Gonbede ghaboos
45.65	0.00	1.92	99.04	62.22	36.32	Minoodasht

Table 26: ranking and comparing environmental hazards and the agricultural insurance

Ranking arable land insurance	Percentage insurance in the arable lands	Ranking environmental hazards	Average percentage of natural hazard	city	row
10	5.82	3	53	Azadshahr	1
5	11.12	6	37.48	Agh ghala	2
4	20.43	11	23.9	Gaz harbor	3
1	96.01	8	32.83	Turkmen harbor	4
9	6.23	2	54.45	Ramian	5
11	5.71	1	54.74	Aliabad	6
6	11.07	10	30.53	Kordkooy	7
7	10.93	9	32.07	Kalaleh	8
3	53.72	4	42.62	Gorgan	9
2	71.17	7	34.53	Gonbede ghaboos	10
8	10.16	5	40.53	Minoodasht	11

According to the above statements it's resulted that in the current situation only the natural result the related to the change climate have relationships with the agricultural lands insurance (the creation of desert and drought)this issue is because that effects of the environmental factors are stable and the farmers in terms of the previous experience action to take the agricultural products insurance and in front of about the other environmental hazards (land slide, earthquake and flood)despite their impact on the agricultural operation and sometimes damage to the agricultural products to cross the press and unstable environment , farmers would pay little attention to the risks. According to the previous studies done human factors including individual and social factors also are affected on the acceptance insurance by the farmers that should also with natural factors be considered.

Provide suggestion

1. Unfortunately with regard to every year natural disasters the large financial and collateral damage to the different parts of the economy, particularly agricultural our country imposed, and understanding of risk factors, especially farmers is to be essential.
2. Because the importance of the agricultural insurance to compensate for losses due to the floods, droughts and others natural disasters, more attention to the agricultural insurance is undeniable.
3. In order to provide better service and to expand the agricultural insurance in levels of participation in government and insurance companies strongly felt.
4. Farmers provide the desired benefits to associate with natural disasters; tend to purchase this type of insurance.
5. Private section requires to the establishment of a state-subsidized reinsurance for the catastrophic natural remedies.
6. To increases the willing of farmers to the agricultural products insurance in the high risk area should be increase their awareness of the dangers of their surroundings, that this work can be done by direct training or experience with other farmers.

References

1. Documents statistics insurance fund the Golestan province
2. Document statics agricultural Jihad the Golestan province
3. *Goli Mahmoudi Habibollah*,"evalution of the amount of farmers damage compensation of agricultural insurance fund in the area sister", jornal of there lopment and Rutal; 12 years, number 4, winter 1388.
4. *Javerian, seid Mojtaba and Amir nezhad Hmid*, "Evaluation effective factors on the insurance claim by paddy", journal of agricultural, 1 period, Number 1 < spring 1387.
5. *Jafarzadeh, Ali*, "importance of the agricultural products insurance in the natural remedies." central insurance of Iran.
6. *Taheri ,Valeh* "analysis and zhoemorphologhic risk zonation in the Golestan province", journal of natural geography ,number4,spring 90
7. *Torkamani Javad* "Evaluation effects of the agricultural insurance in the reducing and operating income inequality" journal of the agricultural economics research, 1 version, Number 1, 1388.