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Research Article

INFLUENCE OF ROADS ON STRUCTURAL-FUNCTIONAL CHANGES OF RURAL SETTLEMENT WITH GREAT FOCUS ON ECONOMICAL AND PHYSICAL FACTORS, CASE STUDY: ZANJAN-TABRIZ FREEWAY, IRAN

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ABSTRACT
Today, availability of roads for villagers is considered as an effective element for development of these areas and environmental, economical and social effects of roads upon rural accommodations is tremendously considerable. The present study was conducted in order to study importance of structural-functional changes of roads upon rural accommodations, and to answer "How do rods change rural accommodation of the area under study?". The Analytical-synthetic methodology was used and data were collected through the field and library data collection method (questionnaire to analyze availability of the villages, the Z model, interview and observation were used too). The standard time distance between the villages under study and the central city was used in order to analyze the information. The results show that establishment of freeways leads to decreased occupation in the agricultural sector, increased rural interest to live in their village, changing usages of the lands and increased emigration from villages to cities.

Keywords: *Road, Rural Development, Structural Changes, Functional Changes, Interaction*

INTRODUCTION
Different economical parties have determined different values for the agent path and have suggested variety of values for way, but there is no hypothesis that evaluates it as a valueless factor, in the current world communication is considered as one of the most active parts of planning and increasing financing in the area (Rahmani, 1996), path has a great in political, economical and social development in urban and rural communities joins different parts of the rural and urban society to one another and leads to connecting different parts of the society to each other and increases the interactions between them (Aderam, 2010). During the past decades because of increasing transportation in villages these areas have changed greatly and usage of opportunity and threat of this phenomenon have been of great importance (Louise, 2009). On the other hand paths are considered to be great factors affecting changes and evolutions in the accommodations. Furthermore path is considered an important factor in changing accommodation. On the one hand improvement of transportation leads to a concentration in economical activities in on area and so facilitates their growth and development and on the other hand functional-structural changes are made in the area. Existence of the paths has led to considerable encourage for the services to direct their efforts on the accommodations with great chance (Tyassykok, 1995). The advantageous and disadvantageous influences and goals of environmental, economical, social and political, is of great importance of rural areas and hence changing views will be really inevitable. The Zanja-Tabriz highway has passed through rural areas and leads to structural-functional changes in buildings. These changes in terms of speeding up in trends of traveling and increasing relationship between the communities and facilitate transportation of agricultural and livestock and therefore increases the rural population's income rate of the villagers and increasing, accordingly using welfare services needed. In addition to the facilities, problems and infirmities like invading and demolition of rural lands, dividing rural areas and separation of fields and water resources in villages. In a way that villagers have to travel more distances in order to use lands and water resources. Hence the Zanjan-Tabriz freeway that has

been located in vicinity of this location has had positive and negative effects on the area. The study of rural settlements situated in the vicinity of the freeway was necessary to get aware of the equipments and facilities established in rural area located across from the freeway.

Theoretical Bases

In terms of economy, way is a means to transport wealth. Agricultural and industrial products are moved from where they are produced to where they are consumed by using ways and increasing production and export rate is possible only through available ways. Therefore, lack or inefficiency of ways leads to infirmities in these goals that is considered a horrible loss and failure from economical point of view (Rahmani, 1996). Path establishment grew rapidly in 1960s to a970s in developing countries and has made the infrastructure for the paths; during 1970s the main priority in developmental modes has been on diminishing poverty. They had found that majority of the families living rural areas are not beneficent from advantages of mass economical growth. Therefore by increasing power and welfare of the poor people we can help them to manage their economical society (Razavi, 1998) rural paths development has had four main results along with this idea, first one was to establish discipline and regulations, second affect was specialized services and trade, movement and shift was the third result of this program and the last result of this program was availability of transporting extra product of villages to cities and therefore urban development is considered as a necessity for rural development (Kotsovi, 2001). Study of influences of roads on rural areas has become of a great importance, recent studies showed that influences of road has indirect affect on structure and function of rural areas and in long term effects these areas (Olsson, 2006). Rosto believes that investments especially on transportation and other natural resources can be considered as the most important conditions needed for continuous industrial growth (Abdoley, 1995). Donex believes that investing on rural roads can lead to increased using of local resources in the origin and development of occupational opportunities and also improved rural industry and lead to decreased poverty in long term. Regarding to Donex increased rural production and increased efficiency are long term results of rural road development (Donnges, 2007). Forinton believes by increasing rural rods and number of villagers who have cars, villager's tent to immigrate to the urban areas in vicinity and thereafter local services decrease in the rural areas around then spatial dependence increases between rural and urban areas (Forrington, 2004).

Some researchers believe that road development in rural areas was due to functional changes in the area and increasing economical opportunities from increased trades in these accommodations was beneficent for rural community that can show the great importance of the roads in rural areas (Chander, 2000). Factors such as development of rural settlements using decreased transportation expenditure, decreased journey length, and availability of local markets are considered as effective factors in spatial changes (Olsson, 2000), and also transferring modern technologies to rural areas has led to faster growth and development of rural areas (Petrs, 2000). Holey and Linback suggest that facilitated availability of technical knowledge, goods and job opportunities available in urban areas are highly affected by the element of road development in these areas (Hoyle, 2000; Leinback, 2001). Generally, road establishment in every rural area can have positive and negative environmental influences different cases such as changing usage of the lands, establishment of availability of services and providing job opportunities, decreased rural-urban immigration and etc. that can affect the model of life in an area. Therefore, to take beneficial use of the facilities and equipments we need to plan in order to decrease environmental, economical, social consequences around the roads to prevent these consequences based on principles of constant development and consequently the economy in the villages change from enclosed survival economy to developed and modern economy which is various and open.

MATERIALS AND METHODS

Research Methodology

The research was practical and descriptive – analytical and combined. Regarding to the presented hypothesis, current study has been conducted in order to figure out changes driven from road establishment in case study, the methodology used was library and field methodology and in the field

methodology questionnaires were used (open questioning, closed questioning and spectrum-scale questioning) observation and interviewing.

In order to analyze the information and examining hypothesis both the $\chi 2$ methodology and standard Z model was used.

Population and Sampling

The population used in the present study involves three villages in Hashtrood Township. All the villages along Zanjan-Tabriz freeway were divided into 3 to 4 clusters regarding to population and equipments of researchers in the case study. The limiting factor was lack of enough financial and time necessities. The villages we have chosen for the present study consisted of 325 households that number of the samples for filling out the questionnaire was regarding to Kokran formulation and was calculated analyzing 120 households.

Regarding to the latest statistics in country divisions has been reported to have two regions and 6 villages. The population grew from 93794 people in 1996 to 75584 in 2006 and later to 64611 people in 1996. Yearly population growth rate from 1996 to 2006 was -1.55 (Table 1).

Table 1: Population change in Hashtrood Township

	Population			Average yearly population growth	
	1986	**1996**	**2006**	**1986-1996**	**1996-2006**
Urban population	15263	17757	20924	1.53	1.65
Rural population	78531	58727	45118	-3.06	-2.60
Township population	93794	75584	64611	-2.15	-1.55

Resource: administration and planning department, 2003; and Statistics Center of Iran, 2006

Discussion

Table3 shows distribution of activities of the samples before, during and after establishment of freeways. We observed that the most economical activities before, during and after establishment of highways wad due to agricultural activities with relative frequency of 74.2, 45 and 35 percent before, during and after foundation of highways, respectively.

Table2: distribution of sample's economical activities before, during and after freeways founded

		Type of occupation	Absolute frequency	Relative frequency (%)
		before	89	74.4
1	Agriculture	during	54	45
		after	42	35
2	Public sector	before	8	6.7
		during	11	9.2
		after	18	15
		before	4	3.3
3	Driving	during	13	10.8
		after	28	23.3
		Before	10	8.3
4	Workers	during	31	25.8
		after	13	19.2
		before	9	7.5
5	Other	during	11	9.2
		after	9	7.5
		before	120	100
Total		during	120	100
		after	120	100

Resources: field studies

Therefore, regarding to the data after roads were founded agricultural job opportunities observed to shrink compared to the past. Furthermore driving and governmental job opportunities observed to rise significantly compared to other occupations. Regarding to the new roads and availability of urban markets rural workers tend to work in urban services.

Descriptive Examination of the Indices under Study in the Survey

In order to accomplishment of the surveys estimation of roles of road in structural-functional changes in rural accommodation with a special focus on economical and fundamental information was collected through questionnaires. The questionnaires were designed in close form and number of absolute and relative frequency was evaluated for each question that one can figure out the importance of the roads in the changes.

Table 4: Influences of freeways in fundamental, economical and population changes of the villages in 1389

	Parameters	Very high		A lot		average		little		Very little	
		No.	%	No.	%	No.	%	No.	%	No.	%
Economical	Have the roads been beneficial for villagers?	24	20	31	25.8	29	24.2	22	18.3	14	11.7
	Income rise for the villagers	17	14.2	38	31.7	31	25.8	24	20	10	8.3
	Increased population in villages	15	12.5	36	3	32	26.7	24	20	13	10.8
	Increased value of fields in the village	34	28.3	39	32.5	23	19.2	17	14.3	7	5.8
	Increased markets for selling their products	44	36.7	42	35	23	19.2	6	5	5	4.2
	Employment of the workers from agriculture to other groups	22	18.3	35	29.2	33	27.5	22	18.3	8	6.6
Populational	Decreased village to city immigration	20	16.6	48	40	18	15	21	11.7	12	10
	Increased hopes for staying between the villagers	48	40	38	31.7	22	18	7	5.	5	3.3
	Increased relationships between us	31	35.8	42	35	28	23.3	10	8.3	8	6.6
	Increased easy use of the city	64	53.3	36	30	11	9.2	6	5	3	2.5
	Increased partitioning of the rural lands	49	40.8	29	24.2	30	25	7	5.8	5	4.2
Fundamental	Modified availability of fields and pastures	51	42.5	34	28.3	21	17.5	8	6.7	6	5
	Changes in management of water and some other problems	23	19.2	31	25.8	41	34.2	11	9.2	14	11.7
	Unsafe bridges used for transportation of goods to city	67	55.8	31	25.8	12	10	8	6.6	0	0
	increase services and infrastructural services	21	17.5	30	25	46	38.3	16	13.3	6	5
	Changed house building of rural accommodation	34	28.3	37	30.8	28	23.3	14	11.7	7	5.8

Resources: field studies

Hypothesis 1: Freeways founded, has had positive economical changes in rural accommodation in rural area, in order to prove the first hypnosis it has been recommended to conduct the studies on two

dimensions and the test methodology was economical situation after establishment of freeways using χ^2 methodology and in the second dimension we are going on working on economical changes and, firstly by using 6 economical indices (table 4) and also χ^2 and in the four stages, study of peoples viewpoint on economical changes after foundation of freeways was to discus.

First Stage: description of statistic data

First index of survey hypothesis one: existence of freeways has led to economical revolution in nearby villages.

H0= There is no significant difference in nearby highways has led to positive economical effect in nearby villages, but there is no meaningful difference.

H1: There was a significant difference between neighboring villages on positive effects of roads on positive economical situation.

Stage 2: Calculation of the experimental test χ^2 is conducted using 6 indices.

Table 4: Calculation of the experimental test χ^2

	Very much		Much		average		little		Really little	
	Observed frequency	Expected frequency	Observed frequency	Expected frequency	Observed frequency	Expected frequency	Observed frequency	Expected frequency	Observed frequency	Expected frequency
1	24	26	31	36.83	29	28.5	22	19.2	14	9.5
2	17	26	38	36.83	31	28.5	24	19.2	10	9.5
3	15	26	36	36.83	32	28.5	24	19.2	13	9.5
4	34	26	39	36.83	23	28.5	17	19.2	7	9.5
5	44	26	42	36.83	23	28.5	6	19.2	5	9.5
6	22	26	35	36.83	33	28.5	22	19.2	8	9.5

Resource: field studies

Table 6: Calculation first of sampling parameter, firstly hypothesis 1

	Too much (O-E)2 / E	A lot (O-E)2 / E	average (O-E)2 / E	little (O-E)2 / E	Very little (O-E)2 / E	total
1	0.15	0.92	0.01	0.41	2.13	3.63
2	0.12	0.04	0.22	1.2	0.03	4.6
3	4.65	0.02	0.43	1.2	1.29	7.59
4	2.42	0.13	1.06	0.25	0.66	4.56
5	12.5	0.72	1.06	9.08	2.13	25.5
6	0.62	0.09	0.71	0.41	2.24	2.06
total	23.5	0.92	3.49	12.5	6.47	x^2 =47.9

Resources: field study

Third Stage: Calculation of critical amount: in this stage critical amount of χ^2 was taken into consideration.

d.f= .(6 - 1) (5 – 1) = 20

x_c^2 (0/05) =31.4104

x_0^2 = 47.9

Stage Four: Decision making

After statistic comparing of test parameter (47.9) with the crucial was determined, it can be observed that testing parameter is located in H1. So in 95 percent probability one can say that the reasons are enough to

fail H0. Hence one can say that existence of the roads has led to good economical changes in the villages located in the neighboring the freeway.

Standard Z Model

Standard Z model was used to show changes in rural economy in rural areas to analyze second dimension of the first hypothesis. 15 indices were use for this (table11). Furthermore a number of villages located along the freeway were chosen and along with the case study villages, availability of services in these villages were studied too, for more accuracy, and then the results is analyzed using Pierson coefficient.

Table 7: The coefficients used in standard Z model

A1 : Islamic Council of the village	**A5 : water refinement system**	**A9 : health assistant**	**A13 : telephone**
A2 : bakery	A6 : high school	A10 : care giver	A14 : electricity
A3 : Basij Base	A7 : junior high school	: A11post box	A15 : public transportation availability
A4 : tap water	A8 : infirmary	A12 : access to the internet	

Table 8: The chart of the villager's availability of the internet

Namevillage variant	**Taroghli**	**The river Babakandi**	**Gelehdeh rood**	**Jeirandarrah valley**	**Barahdeh**	**KhalifakandiHatam**	**Average**	**Variance**
Public transportation	1	1	1	1	1	1	1	0
Electricity	1	1	1	1	1	1	1	0
Telephone	1	1	1	0	0	1	0.67	0.516
Internet availability	1	1	1	0	0	0	0.50	0.548
Post box	0	1	0	0	0	0	0.17	0.408
Care giver	1	0	1	1	1	1	0.83	0.408
Health assistance	1	1	1	0	0	0	0.50	0.548
Infirmary	0	1	1	0	1	0	0.50	0.548
Coeducational junior high school	0	1	1	0	0	0	0.33	0.516
School	0	1	1	0	0	0	0.33	0.516
Water refinement system	1	1	1	1	1	1	1	0
Tap water	1	1	1	1	1	1	1	0
Basij base	1	1	1	0	1	1	0.83	0.408
Bakery	1	1	1	0	0	0	0.50	0.548
Islamic Council of the village	1	1	1	0	1	1	0.83	0.408

Resources: housing and population statistic, 2006, field study

In the first stage for each variable under study one rank was anticipated and for the villages where all the mentioned services were provided the grade 1 and for the villages without the mentioned services the grade0 was given. Along with this, after extraction of the housing and population data from the statistic data pamphlets for 1385 the table of their access was drawn.

In the second stage average was determined using the formula $=\frac{\sum XI}{N}\overline{X}$ and variance was calculated using this formula: $S = \frac{\sum(xi-\overline{x})2}{N}$ (Mehdinejhad, 1999)

Results from the second part are presented in table12.

Table 9: Standard rank's table in case study villages where the services exist

variable Village name	Galle dare rood	Baba kandi	Tareghli	Barrehdeh	Khalifekhandam khatam	Jeirandarre
Standard mark	2.74	2.11	-0.53	-3.29	-3.44	-8.1
Public transportation availability	0	0	0	0	0	0
Electricity	0	0	0	0	0	0
telephone	0.64	0.64	0.64	-1.03	0.64	-1.03
Access to the internet	0.09	0.09	0.09	-0.91	-0.91	-0.91
Phone	-0.42	0.58	-0.42	-0.42	-0.42	-0.42
Care giver	0.42	-1.03	-0.42	0.42	0.42	0.42
Healthcare assistance	0.09	0.09	-0.91	-0.91	-0.91	-0.91
infirmary	0.09	0.09	-0.91	0.09	-0.91	-0.91
Coeducational junior high school	0.36	0.36	-0.64	-0.64	-0.64	-0.64
High school	0.36	0.36	-0.64	-0.64	-0.64	-0.64
Water refinement system	0	0	0	0	0	0
Tap water	0	0	0	0	0	0
Basij base	0.42	0.42	0.42	0.42	0.42	-1.03
Bakery	0.09	0.09	0.09	-0.91	-0.91	-0.91
Islamic Council of the village	0.42	0.42	0.42	0.42	0.42	-1.03

Then in the third stage by using the Z standard mark all the criteria were standard.
Firstlt the Herston average was calculated using the formula below (Khoshayand, 2002)

$$\bar{y} = \frac{1}{n}\sum_{i=1}^{n} yij$$

$$Sd = \sqrt{\frac{\sum_{i=1}^{n}(yi-\bar{y})^2}{n}}$$

In the fourth stage the variance in each column is calculated from each table using the formula below:

$$Zij = \frac{yij-\bar{y}}{sdj}$$

In the fifth stage using the average and variance of each column from the table 12, the Z-table is made using he formula bellow

$$Zij = \frac{yij-\bar{y}\,j}{sdj}$$

In this formula, yi is average, sdj variance in the jth column.

In the sixth stage, standard availability of services is obtained from calculation of overall amount of Zij (standard amount), for the confine. After calculation of the grades in the villages, the villages are classified from availability point of view so that the villages with high grades and rankings are more developed and the villages with low grades are less developed from access to the services point of view.

After ranking the villages analyzing Z standard is used to continue to the stage two and getting to know the relationship between levels of development and availability of roads is a multi stage phenomenon that is done through the stages below:

First stage: using field survey and getting information from road department of the province, variety of the roads available in the case study are presented in the table 10 and ranked.

Table 10: Variety of the roads and their ranking

Roads	Points	Variety of roads	Points
Roads for jeeps to pass	1	Alternative way	4
Land	2	main road	5
Shoseh	3	In a freeway	8
Asphalt	5		

Resources: Road and travel department on Azarbayjanesharghi province

Considering all the types of roads available, the point to be given to each village was calculated. As one can see in this chart Galeh dah rood and Babakandi and Tareghli showed the highest point and Heiran showed the lowest point.

Table 11: Point for roads in each village

Village's name	Access type	Points
Gallehdar rood	Alternative way + on the	12
Baba kani rood	Alternative way + on the way of freeway	12
Tareghli	Alternative way +on the way of highway	12
Khalifehkandi - Hatam	shose + Alternative way	7
Barrehdeh	shoes + Alternative way	7
Jeirandarre	earthly + Alternative way	6

Resources: field studies

Third Stage: First amount of averages was to be calculated then variance from average is calculated for Z that was indicative of rural expansion and points of each village from point of availability of rural roads were calculated using following formulas (Mohammadi and Kianni, 1386).

$$\bar{x} = \frac{\sum xi}{N} \text{ و } \bar{y} = \frac{\sum r1}{N}$$

$$C_{xy} = \frac{\sum Ni(xi - \bar{x})(yi - \bar{y})}{N}$$

Finally after calculating the variance for two groups of variables i.e. Z indices are calculated and the ranking and points of rural roads, the correlation coefficient between these variables in the villages is presented in the table 12.

Table 12: The calculated correlation in the case study villages

Calculated correlation	**Calculated Z index**		
0.958	1	Pierson correlation	Calculated Z index
0.003	0	meaningfulness	
6	6	number	
1	0.958	Pierson correlation	Calculated
0	0.003	meaningfulness	
6	6	number	

**- correlation in 0.01 significant*

As you can see from the results too, the calculated meaningfulness for the villages was close to 15. In other terms since the calculated significance in Pierson methodology is between -1 and 1, the closer the number gets to 1 the more correlation is that means there is a really strong relationship between two variables and the closer the number gets to 0 the correlation shrinks and if it gets close to -1 correlation is negative, as is shown in the table 12 this number for the case study villages is 1, so it will show that there is a strong and direct correlation between development of the villages and availability of appropriate roads for them. The villages with better availability of roads are of great economical, financial, entertainment, official, religious and communicational background.

The Second Hypothesis

Second Hypothesis: There is a significant correlation between establishment of freeways and fundamental population changes. To evaluate this hypothesis 3 indices in population and 7 indices in fundamentals were studied using χ^2 test. Then by using the model of road availability map their effect in decreasing time interval and population changes is studied.

Table 13: Calculation of parameter of the hypothesis index2

	Too much		**A lot**		**Average**		**Little**		**Very little**	
	Observed frequency	**Expected frequency**	**Observed frequency**	**Expected frequency**	**Observed frequency**	**Expected frequency**	**Observed frequency**	**Expected frequency**	**Observed frequency**	**Expected frequency**
1	20	33	48	42.66	18	22.66	21	12.66	12	8.33
2	48	33	38	42.66	22	22.66	7	12.66	5	8.33
3	31	33	42	42.66	28	22.66	10	12.66	8	8.33

Resource: field studies

First Index of Research Hypothesis 2: Roads have led to population changes in neighboring villages.

First Stage: Statistic hypothesis definition

H0= there is no significant correlation between villager's ideas about positive effects of freeway establishment on neighboring villages.

H1= there is a significant correlation between villager's ideas about existence of freeways and population changes.

Second Stage: Calculation of the parameter $\chi 2$

Table 14: Calculation of the parameter first index test of second hypothesis

	Too much	**A lot**	**average**	**little**	**Very little**	**total**
	(O-E)2 / E	**(O-E)2 / E**	**(O-E)2 / E**	**(O-E)2 / E**	**(O-E)2 / E**	
1	5.12	0.67	0.96	5.49	1.62	13.86
2	6.82	0.51	0.02	2.53	1.33	11.21
3	0.12	0.01	1.26	0.56	0.01	1.96
total	12.1	1.19	2.24	8.58	2.96	x^2 =27.02

Resource: field studies

Third Stage: Critical amount calculation
d.f= 0 (3 – 1) (5 – 1)
$x_c^2(0.05) = 15.5073$
$x_0^2 = 27.08$

Fourth Stage: Decision making
After statistic comparison of the test (27.02) with critical amount (15.5073) it will get clear that the test parameter is located in H1 region. Therefore, this hypothesis that establishment of highways has led to population in neighboring villages is proved.

Second Index

Search Hypothesis 2: freeways have resulted in fundamental changes in neighboring villages.

First Stage: Definition of Stoical Hypothesis

H0= between ideas of rural population in view of the fact that freeway foundation leads to fundamental changes in neighboring villages, there is not a significant difference.

H1= there is a significant difference between villager's ideas given fact that establishment of freeways leads to fundamental changes there is a significant difference.

Second Stage: Calculation of the test parameter in $\chi 2$ test is done using 7 indices

Table 15: Calculation of the second test parameter in hypothesis2

	Very much		**A lot**		**Average**		**Little**		**Very little**	
	Observed frequency	**Expected frequency**	**Observed frequency**	**Expected frequency**	**Observed frequency**	**Expected frequency**	**Observed frequency**	**Expected frequency**	**Observed frequency**	**Expected frequency**
1	64	44.14	36	32.57	11	27	6	10	3	5.58
2	49	44.14	29	32.57	30	27	7	10	5	5.58
3	51	44.14	34	32.57	21	27	8	10	6	5.58
4	23	44.14	31	32.57	41	27	11	10	14	5.58
5	67	44.14	31	32.57	12	27	8	10	0	5.58
6	21	44.14	30	32.57	46	27	16	10	6	5.58
7	34	44.14	37	32.57	28	27	14	10	7	5.58

Resource: field studies

Table16: Calculation of the test parameter index, hypothesis2

	Very much (O-E)2 / E	A lot (O-E)2 / E	average (O-E)2 / E	little (O-E)2 / E	Very little (O-E)2 / E	total
1	8.94	0.36	9.48	1.6	1.19	21.57
2	0.54	0.39	0.33	0.9	0.06	2.22
3	1.07	0.06	1.33	0.4	0.03	2.89
4	10.1	0.08	7.26	0.1	12.7	30.26
5	11.8	0.08	8.33	0.4	5.58	26.33
6	12.1	0.2	13.4	3.6	0.03	29.34
7	2.33	0.6	0.04	1.6	0.36	4.93
total	47	1.77	40.1	8.6	20	x^2 =117.5

Resource: field studies

Third Stage: Calculation of critical value
d.f= 0 (7 – 1) (5 – 1) = 24
x_c^2(0.05) = 36.4151
x_0^2 = 117.5

Fourth Stage: Decision making
After statistic comparison test (117.5) with the critical value (36.4151) gets clear that testing parameter is placed in the region H1.Therefore, one can state that in 95 certainty level results stand for failed H0hypothesis.Thus one can state that the hypothesis of villager's idea that establishing freeways leads to fundamental changes in neighboring villages.

Availability Model
Possibility of accommodations being connected to each other is a function of communication net and its type, it is clear that by delivering the communication web, for availability only stating the difference between regions (distance matrix) will not do and besides distance matrix, time interval matrix between the accommodations is used too. To better study the second hypothesis and analyze effects of the effects of freeway on decreasing the time interval and increasing villager's visits to cities through availability model is just as bellow.

First Step: Regarding to the region (mountain, Mahoor hills, plain) that the road is located in there and road type and speed divisions is done on the way.

Table 17: Average speed v3, v2 T v1 in different regions

Topography way type	Smooth	Mahoor hills	Mountains
Freeway	110	90	-
main road	90	80	70
Alternative road	75	67-70	60-65
Prism way	35	30-33	23-25

Second Stage: Time interval matrix is being calculated from bellow formula.
X1: road length between accommodations a and b is situated in smooth areas
X2: road interval between a and b is situated on barrow hill
X3: road interval between a and b is situated in mountain areas
V1: normal speed for main ways on barrow hill
V2: normal speed in main ways was for barrow hill
V3: normal speed in main roads was for mountains
Regarding to this formula time interval matrix before and after freeway was established in the villages under study in the table 18 was calculated.

Table 18: Time space between the villages and township before the freeway was found

Time Road type	Time GAledeh village time space	Babakandi village time space	Taregly village time space
Alternative mountain	10	10	10
Prism mountain	38.4	19.2	9.6
Total	48.4	29.2	19.6

Resource: field studies

Table 19: Time space between studied villages and township center after freeway

Time Road type	Time GAledeh village time space	Babakandi village time space	Taregly village time space
Alternative mountain	8.7	4.36	3.18
Prism mountain	10	10	10
Total	18.7	14.36	12.18

Resource: field studies

Considering to the time space between villages and township centers in different roads and also interviews with the rural settlers times of recourses during the day, week and month are presented in table 20.

Table 20: Times of rural population visiting the township center before and after establishment of freeway

City name number	Hashrood Before	After	Tabriz Before	After
Daily	1	3	-	1
Weekly	4	8	2	5
Monthly	10	18	7	12

Resource: field studies

Considering the fact that, times of visits to Hashtrood has changed for after and before freeway was found, because overall time needed to visit the city centerfrom32.4 min before freeway was made to 15.4 min after it. Before freeway was found people only traveled once a day from village to visit the city, but after it was found because of easier commuting and also increased number of personal vehicles it has increased rapidly. It has made it easier for the rural settlers to use urban facilities and equipments and then decreased immigrations from villages to cities.

RESULTS AND DISCUSSION

Development of roads is considered very important factor for meeting people's need in the future. Existence of appropriate road network leads to better use of the recourses on the earth. It makes roads important factors for development and advance of the settlement and one of the most important factors of rural development is availability of rural settlement. Since this communicates the world outside the settlement; social and economical trades get easier between communities. Tabriz- Zanjan freeway that passes through some rural territories leads to structural and functional changes in the settlements.

These great changes in traveling and communication with other societies, easier transferring of agricultural products and so increased income rate in the villages and subsequently welfare and services would be reasonable to be taken into consideration in the area. Functional- structural changes in rural

accommodations around Tabriz freeway are studied in the current study. The results show that the freeway has greatly affected the rural population's occupational status for the villagers and agriculture plays less important role than services in economy in a way that before freeways 74 percent of the interviewees who are occupied in agriculture and since the freeway was established just 35 percent have been working in this sector. On the one hand before the freeway was established the services owned 8.3 percent of the economy but after that it enhanced to 57.5 percent. The most important point about occupational structure before and after the freeway was founded is industry has not grown at all, most of the rural houses near the freeway are located very close o the highway and easily can use the consumption market, but lack of necessary infrastructure has led to insufficient growth in this sector. Regarding to effects of existence of the freeway in economical index, interviewees believe that increased land price by 36.7 percent in population index has increased staying courage by 48 percent and from fundamental point of view lack of appropriate underpasses for transportation of their agricultural products by 55.8 percent has had the most effects on the case study. Study of the changes in the case study (three villages around the freeway) the effects of roads gets clear in structural and functional changes in the area. In these areas positive economical, social and fundamental changes and developmental changes have occurred due to better availability of cities and etc. however, establishment a road has some side effects such as environmental losses and damages, changing water pools, pastures, springheads, aqueducts, and active and arid lands change that the side effects can be taken control using good management practices. Therefore for having an acceptable lifestyle in either a city or a village one needs different facilities such as shopping centers, cultural and educational centers, and hygienic and treatment facilities and equipments are necessary so taking care of a transportation and communication in rural areas is considered of great dimensions of rural areas that can provide the infrastructure needed for reaching rural development.

Suggestions

- Increased attention from government to road development in villages in the form of basic policies of rural development
- Designing and performance of road establishment in local scale in order to finding less developed areas
- Roads result in increased tourism along the roads, therefore planning is necessary for attracting theme to rural areas
- Planning in order to use services and welfare organizations along the roads to increase income rate and occupation in villages
- In road establishment one should pay attention that cultural and historical buildings should not be destroyed or damaged.
- Expansion of infrastructure needed for development of industry along the roads
- Evaluation of various effects of roads on nearby settlements before its establishment.

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