Design for Scientific RENAISSANCE

JASER

Interdependences between rural (countryside) development and natural resource management in Kurdistan Region Iraq. Case study "Qazah Pshdar" – Nahea Sangasar

Article Info

Received: 10/12/2018
Accepted:30/12/ 2018
Published online: 31/12/2018

Othman Karim Mohammed [1], Jemil Jelal [2], Omed mohammed Amin[3], Karzan Saleem Ismail[4]

[1]Sulaymaniah Polytechnic University/ Engineering College/ City Planning Engineering Department; [2]University of Sulaimani / faculty of human science; [3]Sulaiyamaniah's general directorate of education; [4]Sulaymaniah Polytechnic University/ Engineering College/ City Planning,
wesmanresul@yahoo.com; dr.jamiljalal@gmail.com
nali22org@yahoo.com; karzan1ep@yahoo.com.

ISSN 2231-8844

ABSTRACT

Absence or even lacks of locally production possibilities for the daily basic needs, in any society or country threatened its progress, growth, and development and has diverse political, economical, and sociological consequences. In (KRI), the production possibility for the most of basic needs above all the daily-consumed foodstuff, has a strong link with the development of the countryside. Unfortunately, the countryside today has lost that vital and historically proved function due to neglecting and almost depopulation that makes the KRI dependent on neighboring countries, Iran and Turkey for more than 50% for their daily basic needs including foodstuff, vegetables, etc apart from the spoiled, mostly deleterious and cancer-causing imported food articles. According to a documentary report of (Rudaw-Tv) within the years 2015-2018 over 1200 tons of spoiled and carcinogen foodstuff items have been found and destroyed. Thus this situation, if continued, could lead the region to irreversible health and socio-economic conditions and further imbalance between rural and urban centers. Thus, the repopulation of the neglected countryside through improving living,-housing,-and production condition and restoration of the functionally disturbed rural-urban relationships are the prerequisite in trying to solve these vital Iraq-wide supply problems. This study focuses at this issue and takes a multidisciplinary approach to reveal the interconnection facts (causes, connections, and solutions), namely how to achieve countryside development through appropriate land use technique methods, and resource planning management as an example, in the study area..

***Keywords*:** Land use planning, Natural resource and natural resource management, Self-sufficiency requirements

1. INTRODUCTION

The fieldwork in the study area the researcher had done preparatory global fieldworks in almost all-geographical area in the KRI to determine the best locality with respect to the targets of the study from one hand and the transfer the obtained results to other regions within KRI and Iraq respectively with the similar conditions from other hand. In the end, we found that the Sangasar territory is the best favorable place, which fulfill these aims. Thus, the choice of the Sangasar territory is not arbitrary but based on a prior intensive preparatory works.

Land and water are among the most important natural resources for life on the earth. The economical use of land and water is the best indicator for the development in every country. Water is the elixir of life. It is also a precious natural resource and important component for human survival. The improvement and development all spheres of life, such Education, Heath, Urban, Economy, growth, Culture, Geography, Agriculture, and Animals resource…etc. is dependent on the required amount of water. Water found abundantly on earth- 97.5% out of the total water reserves of the world water is salty and only 2.5% is fresh water. Even this small fraction of fresh water is not available to us as most of it locked up in polar ice caps and just 0.003% is readily available to us in the form of ground water and surface water. With increasing human population and rapid development, the world water demand and agricultural lands investment have increased many folds. Agriculture is one the pattern for land investment including intensive cultivation of strategic crops and development of forests, animal, poultry [6,7]. Moreover is the basic for food production and fiber for human, the jobs for millions of peoples in the world. Dry land farming cultivation which depends entirely on rainfall forms 41% of the world area, including 1/3 of the world population and its utilization is limited due to water stress and high evaporation, although providing irrigation water results in the economic investment of its natural resources [8].

Regarding the study area, KRI, and Iraq in the whole, it is a well-known fact that both territories are dependent mainly on neighboring countries, Iran and Turkey, regarding to the supply most of the daily basic needs for their population, including foodstuff and water. In contrast, there is abundance availability of natural resources, such as enough fertile land, material, and the required human resources and into some extent the availability of water1. Deficiency and importing more foods and daily needs from one side and availability of the countryside to cover these needs from other side is the main motivated factor in conducting this study. Thus, the study has concentrated in finding the links between the rural development and reconstruction of destroyed and neglecting villages respectively. It was finding that possibilities could rise only through forcing the efficiency use of locally available material and immaterial resources. All these measurements was revealed by applying land classification techniques, related proper tables and maps, estimation the required current and future water demand, and the resulting total land productivity. The achieved and evaluated concept obtained in the study area is later transferable into other territories within the Kurdistan region and other parts of Iraq with similar conditions.

[1]) the availability of water is naturally closed with the diversity of geographical features of the region. There are water-arm regions and in contrast regions where water is scarce natural good.

2. CURRENT SITUATION OF LAND- AND WATER RESOURCES IN KRI

2.1 land resources and land use

The diverse geography characteristics of Kurdistan region, appears as a wide plain area as well as mountain area, is very helpful for the practicing diverse uses of land; i.e. for all economic activities, agricultural, industry, and tourism. The plain area with a measure of about (924,000 Ha.), comprises many sub regions with distinctive climate (from low to high temperatures) and terrain conditions and soil qualities which qualified them for different uses around the year. These distinctive characteristics guaranteed different rain-fed area from 15%, as non-guaranteed, 35% as, semi- guaranteed and 50% guaranteed rain-fed areas [4, 5, 6]. Although there are also districts which into some degrees "suffer" from water deficiencies, for example, water deficiency in Qaladizah territory was 150 million m³ water while in Tanjaraw territory was 197 million m³ and in Sirwan territory was 190 million m³ for the complete investment of agricultural lands [9,10,11].

2.2 Water resource and water harvesting:

The Kurdistan region is rich with water resources; it has five big rivers[2]) with a water discharge of 29.77 m³ billion annually, 17.74 m³ billion of which emerges from within the KRI's borders while 12.03 m³ billion comes from neighboring countries, in addition to underground water which is estimated at more than 5 billion m³. The process of managing and maintaining water resources is not efficient. This is due to several factors:

2.3 low water storage capacity

low number of big and strategic irrigation projects, trespassing on the rivers' discharge and shores, the misuse of water by the irrigation projects. Misuse of underground water welling with and without permission [3].

As for the dams, 16 dams have been built so far. Many other dams are under construction, three of which are medium sized while 22 are small dams. 91 ponds were built, 29 ponds are under construction, and 105 ponds are currently in the designing phase and have been announced for tendering. The number of ponds will reach 320 ponds by the end of 2019.

As for irrigation projects, around 21.3% within the KRI depends on irrigation water and 78.7% depends on rainwater [3]. Despite these favorable conditions regarding fertile land and almost sufficien water for enough production and developing the countryside, the population, in Kurdistan region are suffering from localy produced foodstuff and the countryside is more and more going to be depopulated migrating into cityies, with the hope to find bettter conditions of life, which consequentely contribute to further distrbution of rural-urban relationships.

2.4 Rural-urban imbalance:

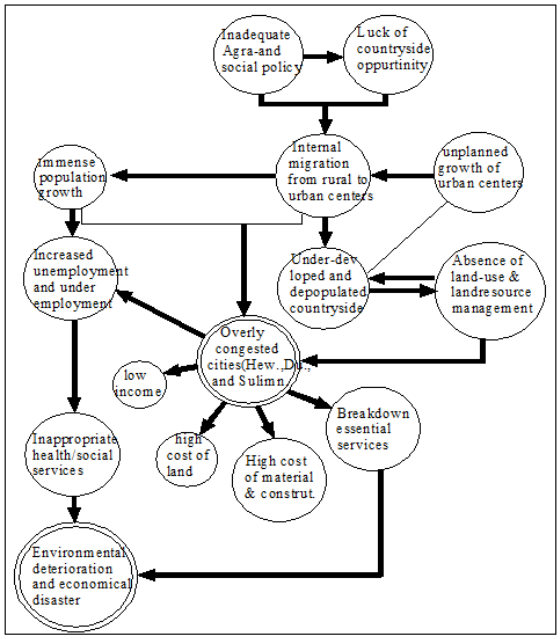
It is clear that the urbanization is a worldwide phnemenon; but the urbanization phenomenon in Kurdistan region is manily due to inapropreate social and economic policy which resulted to stregthen the so called push-pull effect acts between countryside (represents by a spare

[2]) Note: both the central- and regional government in Iraq don't have control on most of these rivers (see the research problem)

populated villages) and existing congested cities, which are growing more and more (see fig 1). It is also the

combined effect of both of both external and internal factors. The desecive e xternal factor was the so called UN-resoulation No. 986 of 199 (without going to its detail and effects) which coupled the foodstuff supply with oil purchase (also food to oil). The internal factors are (1) false economical, social, and development policy of the regional government in Arbil and Sulaymaniah. Unfortunetly this inadaquate policy is still being practiczed, which brought the society into this current misarable condition in Kurdistan region, and (2) absolute dependence on oil as the solely national resource income.

Besides the consideration related to current situation and resource management respectively, mentioned above, the research problem is the fluctuation of water supply to study area and Iraq as a whole. This fluctuation is partly natural (dry years), but mainly policy and economical motivated actions forced by bordering countries. The fact, that the Land Iraq (including the study area) is a down stream country depends for water on upstream Countries, namely Turkey and Iran. "Both Turkey and Iran are located at headwaters. Turkey for example located at the headwaters of the Tigers and Euphrates Rivers, controls, how much water flows downstream to Syria and Iraq (see table 2). Turkey has built 24 dams along the upper the Tigers and Euphrates Rivers. These dams will reduce the flow of water up to 35% in normal years and much more in dry years. Syria also plans to build a large dam along Euphrates Rivers to divert water arriving from Turkey. These activities of bordering countries will leave little Water for Iraq" [13] . It is also a well-known fact that both mentioned countries has not been showing co-operations regarding this problematic with Iraqi government into a suitable degree up to date. If the resolving water distribution problem between the Iraq and its neighboring countries, in the form of regional cooperation in allocating water supplies, did not take place, so accordingly both the federal- and regional governments in Baghdad and Erbil have to layout another and common future oriented water strategy with regard to supply and use.



1 Flow diagram showing major problem component observing in the country side that causes rural-urban imbalance at the same time i.e. high out Migration from the countryside and high concentration in Sulaimaniyah. (Source: adopted with the necessary completion, from [1]:

From the planning and resource management's points of view, the study has two main interconnecting objectives:

(1) A short-and medium term objective, expressed as countryside development objective, which should rreveal the interdependences - between the agricultural,- industrial and settlement development planning and the overall land development planning on a sustainable basis in the study area. Thus, this objective should imitate a reconstruction process of the destroyed and neglected villages and so put a solid base for the next long term objective.

(2) A long-term objective, expressed as national foodstuff and water security target. This objective should bring the natural resource management (material and immaterial) into a state where the self-sufficiency target secured and achieving an urban-rural balance,

As summeery the objectives of the study is how can and into which degree the study area, with its material and immaterial capacites contribute to:

Reducing the socio-economic and political impacts from imported basic need articles including foodstuff, contributes to self-sufficiency (national food- and water security), at least in Kurdistan region, and

Evaluating into which extent the obtained parameters and inducators in the study area are transferable to other territories within Kurdistan Region and into other geographical parts of Iraq with similar situations.

3. MATERIALS AND METHODS:

The study used an analytic-destructive approach using the tools of related scientific disciplines and techniques such land use planning, resource management planning, social indicators, and physical geography. Starting by classification the total area of the studied area (Sangasar) 223007 donum = 55751.75 hectares, into Irrigated, non-irrigated (dry land) and mountainous- and forest area. Based on this general classification it is to distinguish between two main land classes or types, with their perceptual representation for each class, as follow:
a- Agricultural land total = 12, 82 % (=233007 Denum, 1 Donum = 2500m²).
a1-agricultural Irrigated land = 9, 05%, a2- Non-irrigated (dry) land farming = 74, 09 %, b-forest area = 76, 53% .The figures above show that the main area is represented by forest = 76, 53%, whiles the smallest one represented by agricultural land = 12, 82 %. The essence of this land typology is the determinations of the current predestinated nature of some land class for a specific use and allocating adequate use for remaining land-types for future use. This fact guided the research to distinguish further between two linked land categories (i, and ii) and a third complementary one (iii). The latter one should act as quasi- feed back and supportive link between the two former, through establishment of agricultural-, fruit-, poultry-, and milk based food industries.
i- Grain growing, especially Wheat and Rice, in both irrigated and dry land areas. In the case of planting both agricultural and dry land areas with rice so the necessary a mount of ca. 1.4 Millions) of people could be harvested. The required water is 62, 9 million. Cubic meter that can be taken from the (little Zab river) . This mount makes about 1,03% of the total amount of water available in the mentioned river. By using the same area noted by the point i for wheat planting and production by irrigation 200 mm (= 500 m3/ Donum) so we can produce the necessary amount of this grain for 238 233 persons. The necessary a mount of water can

like wise be taken from (14.3 million m3), which makes 0.24% of its annually total amount of water. The annual amount of water in (little Zab river) is 6 Millard cubic meter = 6 cubic kilometer. ii- Wild fruit root stocks such as wild pear for production the variety of desirable local wild pear (Harmey gulawy, Naske harmey and harmey lasura), that they do not need watering, depending on seasonal rainfall. The same is valid for wild almond, bitter almond , and wild cherry.

iii- With reference to points i and ii as a source for providing raw material, the planning for establishment of various related industries, like fruit juice, marmalades, apricot Peach, plum production, and animal feeding stuff, etc has been done.

Table 1: The KRI's land size in hectares

Cultivated land		Forest		Horticulture			Rangeland	total
Rain fed	irrigated	handmade	natural	Vegetable irrigated	Orchard Rain fed	Orchard irrigated		
1.2089,366	327,429	327,428	14,436	297,029	35,082	30,399	1,734,443	4,569,608

Table (2) Surface water in the KRI (Kurdistan Region Iraq)

River name	Length of river in Km	Annual discharge Billions m³	Outside KRI %	Inside
Khabour	160	1.6	58	42
Great zab	392	14.32	42	58
Little zab	400	7.2	36	64
Awa spi	230	0.79	00	100
Sirwan	384	5.86	66	34
Total		29.77	40.4	59.6

Water resource status in KRI

Table (3) the role of plant cover on percolation of rainfall to ground water aquifers.

Type of plant cover	Percolation of water to ground water aquifers m³/Year	mm/ha/Year
Land without plant cover	1955.8	195.8
Lands with pines cover	3854.4	383.54
Lands covered with seasonal plants	8077.2	424.18
Lands cultivated with Cereals	4368.8	436.88
Lands covered with small Oaks	4419.6	441.96

It is obvious from table 3 above that the rich areas with small Oaks allow precolating more rainfall 441.96 mm/ha./year to ground water aquifers, followed by cereals 383.54/ha./year. The smallest portion of percolated water is bar land (Lands without plant cover), 195.8 mm/ ha./Year.

Irrigated orchards: It forms small percent of the territory, with 0.09%, due to disorganization of water resources of the territory.

Non-irrigated orchards: It comprises about 0.35% of the territory areas. Orchard fruits include mostly grapes, hawthorn, wild pistachio, smucks, wild almond, and almond, wild cherry and wild Pears. Some of the mentioned fruits, such as hawthorn can be grafted with Loquats, Almond with plums, wild Pears with local commercial (pears, Wild Pistachio, and wild almond with plums, apricot, and Peach.

Table (4) the nature of land distributions in the study area.

No.	Type of land	Area/ donum	Area Km^2/	%
1	Irrigation lands	8035	20.9	3.60
2	Dry land farming	20553	51.38	9.22
3	Immerged lands	1405	3.51	0.63
4	Marginal lands	7507	18.77	3.37
5	Pasture lands	13850	34.61	6.21
6	Forest lands	179665	426.66	76.53
7	Irrigated orchards	197	0.49	0.09
8	Non irrigated orchards	797	1.99	0.35
Total		223007	486.43	100

Table (5) land investment with winter vegetables and their water harvesting.

Vegetable	Area / donum	Seasonal water requirement (4)		Harvested water	%
		m^3	mm	m^3	
Onion	3500	1125	450	3937500	92.24
Garlic	30	1000	400	30000	0.76
Total	3530			3967000	100

The above table shows that onion ranks first in water harvesting with 92.24% followed by garlic 0.76%.

Table (6) land investment with dry farming vegetables and their water harvesting.

Vegetables	Area /Donum	%	Required water (6) m^3 mm	Required water m^3 / season	%
Snack-cucumber	25	14.29	1000 400	25000	14.29
Melon	150	85.71	1000 400	150000	85.71
Total	175	100	2000 800	175000	100

It is obvious from the above table that melon ranks first in land investment and water harvesting with 85.71%.

Table (7) investment lands with summer crops and their water harvesting during (2015-2016)

Vegetables	Area/Donum	%	Required water(10) m^3 mm	Harvested water m^3/ season	%
Okra	110	17.27	1250 500	137500	14.96
Watermelon	200	31.40	1250 500	250000	26.71
Cucumber	85	13.34	1250 500	106250	11.35
Tomato	90	14.13	2000 800	180000	19.23
Eggplant	60	09.42	1750 700	105000	11.22
Cowpea	40	06.28	1750 700	70000	07.48
Pepper	20	03.14	1750 700	35000	03.74
Pumping	15	02.35	1500 600	22500	02.40
Beans	10	01.57	1750 700	17500	1.87
Ground Nat	07	01.1	1750 700	12250	1.31
	637	100		936000	100

The above table shows invested lands with summer crops, which were very low due to non organizing water resources, rain fall fluctuations, and introducing vegetables from neighbors countries.

Table (8) investment areas with forests, Pastures, orchards and their water harvesting.

Type of investment	Area donum	Necessary water mm m³/Donum	Annual harvesting water	%
Natural pasture	13850	450 1125	15.581,250	7.46
Forests	170665	450 1125	191.998.125	91.94
Irrigated Orchards	197	700 1750	344.750	0.17
Dry farming Orchards	797	450 1125	896.625	0.43
Total	185.509		208,820.750	

Land investments with forests recorded highest percentage of 91.94% followed by pasture 7.46%, irrigated orchards, and dry farming Orchards was 0.17 and 0.43 respectively. The superior of forests in water harvesting over other investments in the above table attributed to large areas of forests 170.665 donum. The annual renewable water in 2015 on the basis annual rainfall 793.06 mm and the total area of the studied area 223.007 donum (55751.75), ha. Calculated from bellow equation: Annual renewable water = annual rainfall* area *.= 5575.75 * 10.000 * 793.06/1000= 442.144.828 million m³. The forests in the studied area harvested 191.998.125 million m³ which forms 43.42% of total annual renewable water, while natural forests, irrigated orchards, and dry farming harvested 208.820.750 million m³ which forms 47.23%.

Table (9) Investment area with rice crops and water harvesting during summer season

Type of crop	Area donum	%	Required water (10) m³/donum mm	Harvested water m³	%
Rice	61.5	67.96	2200 8800	135300	74.01
Sun flower	10	11.5	1500 600	15000	8.22
Corn	15	16.56	1500 600	2250	12.31
Cotton	4	4.42	2500 1000	10 000	5.47
Total	90.5	100		182800	100

The above table 9 shows land investment with summer crops and their water harvesting at Sangasar territory. It is clear from table 4 that the investment area with summer crops was very low. This might attributed to the employment of most employs in governmental offices receiving salaries without any work, non organizing water resources in the studied territory. Moreover introducing most requirements from neighbor countries [9,10].

Table (10) the investment area with winter crops and their water harvesting during (2005 – 2009).

Type of crop	Area/donum	%	Required water (6) m^3 mm	Harvested water m^3	%
Wheat	1200	71.9	1000 400	12 000 000	77.62
Barley	4600	27.56	733 293	3369000	21.80
Broad bean	90	0.54	1000 400	15459500	0.58
total	16.690	100		30828000	100

Land investment with wheat recorded 71.9% among winter crops followed by barley and broad beans respectively. Moreover, wheat ranks first in winter harvesting with 77.62%. The differences in water harvesting among winter crops attributed to differences in area and water requirement [10]

Table (11) Summery table of land investment and water requirements

Type of land	Area/ donum	Invested area/donum	%	Non invested area/donum	Water requirement m^3 /year
Irrigated land	8035	727.5	9.07	7307.5	12788125
Dry farming land	20553	15395	74.90	5158	26941250
Total	28588	16122.5	83.95	12465.5	39729375

It is clear from table 11 that the investment area with summer crops was relatively low 9.07% (727.5 donum) from total irrigated lands 8035 donums. These causes mainly by:
1. the employment of smart employees in government offices receiving salaries without doing any work, 2. non organizing water resources in the studied territory, and,
3. Importing most requirements and basic needs from neighbor countries [9,10].
Fig. 2 shows the average of high and low temperature from 1984 – 2009 (Data from metrological station of Dukan Dam)

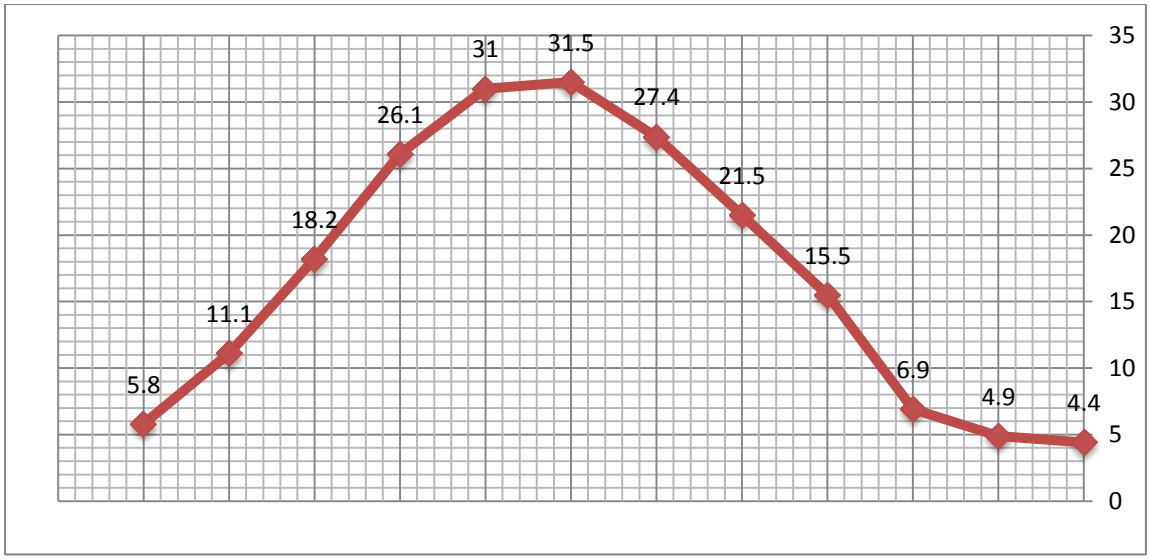


Fig. 2 bellow shows annual rainfall distribution in the studied area (Sangasar) during 1984-2009), according to recorded data of Ducan meteorological station. The highest recorded rainfall was in January (147,41 mm) followed November (145,92mm). Summer is hot with no rainfall. (Data from Metrological station of Dukan dam)

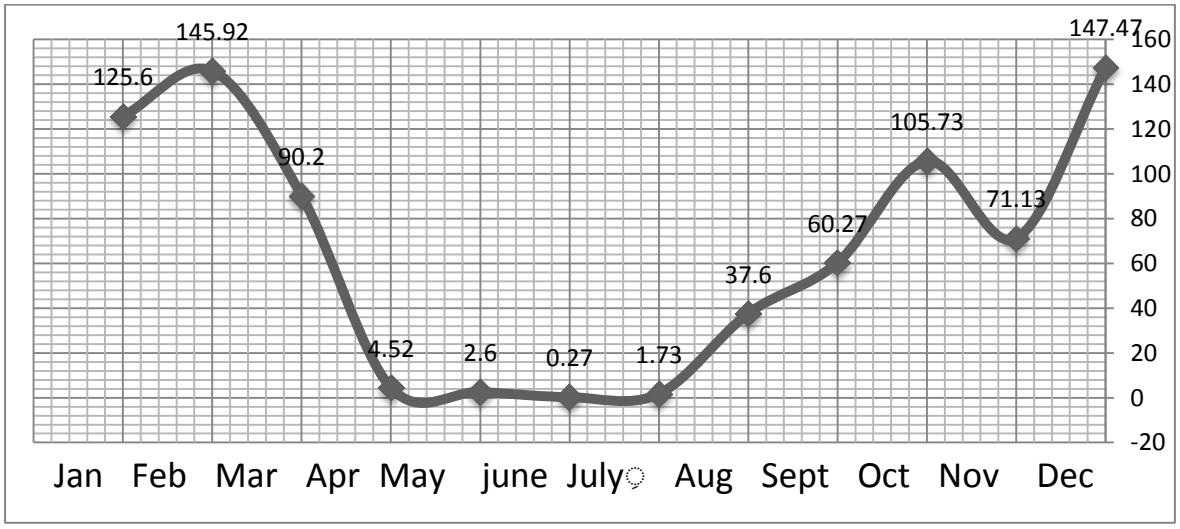


Fig. 3 shows the evapotranspiration range from 1984 – 2009 (Data from metrological station of Dukan dam).

To diagnose the climate area of the studied area in terms of draught and humidity, Demarton coefficient [5,10] was used in this study, through finding the average of annual rainfall of the available years 793.06 mm and average of annual temperature 17.02 c^o.

Demarton draught coefficient = average of annual rainfall / average annual temperature + $10c^o$ =793/17.02=29.35.In comparison 0f the calculated Demarton value 29.35 with tabulated Demarton, we find that the calculated demarton value is within the interval 20-30, indicating

that the climate of the area is moist [10]. Fig.3 above shows average monthly evapotranspiration during the years (1984 – 2009). The highest evapotranspiration was recorded in July (174 mm), followed by August (209.5mm) and June (174,1 mm). In general, the evapotranspiration during the summer growing season may be (52.9 mm) to October (62.4mm) is higher in winter growing season which starts normally from November to May. The lowest evaporation was in winter season which starts from around mid of December to mid of March in contrary summer seasonwhen evapotranspiration is the highest resulting in crops water demand.

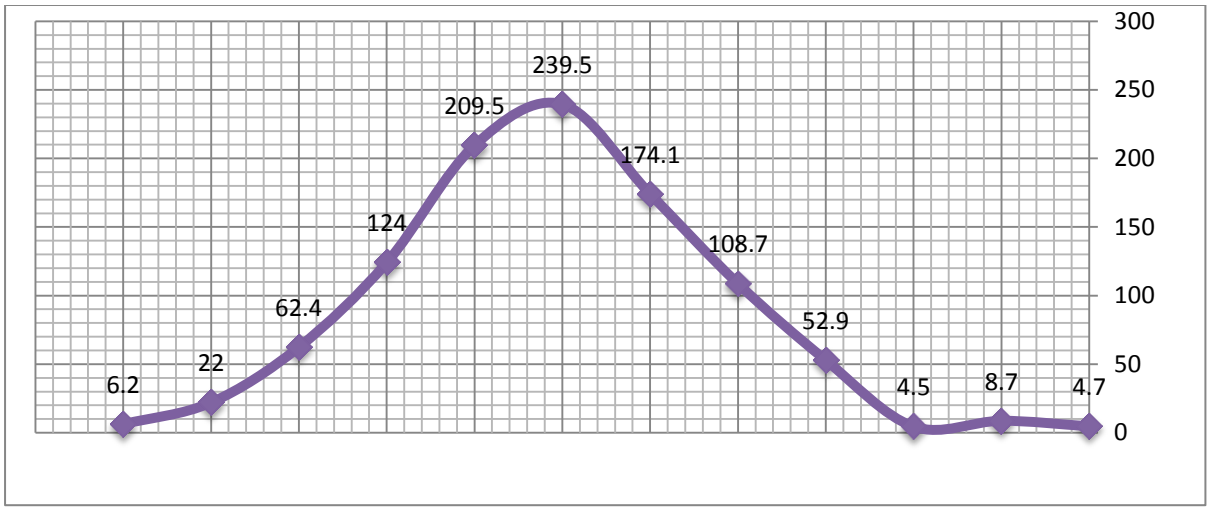


Fig. 4 shows average relative humidity during 1984-2009). The lowest relative humidity in summer growing season that results in increasing water demand.The highest relative humidity is in the winter season, while is excesses rains and moisture there.

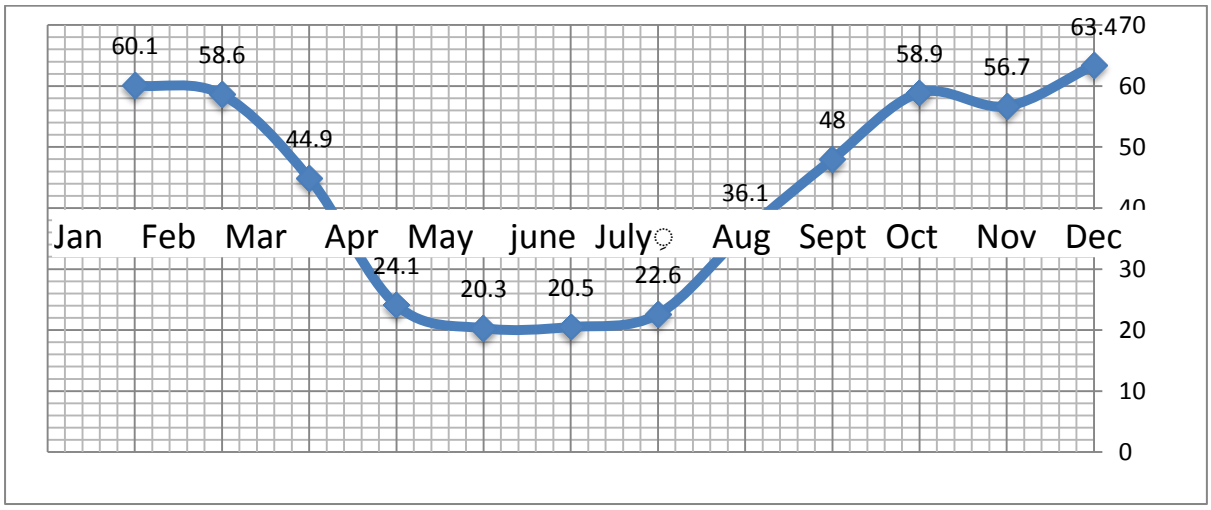


Fig.5 shows the Relative humidity from 1984 – 2009 (Data from metrological station of Dukan dam)

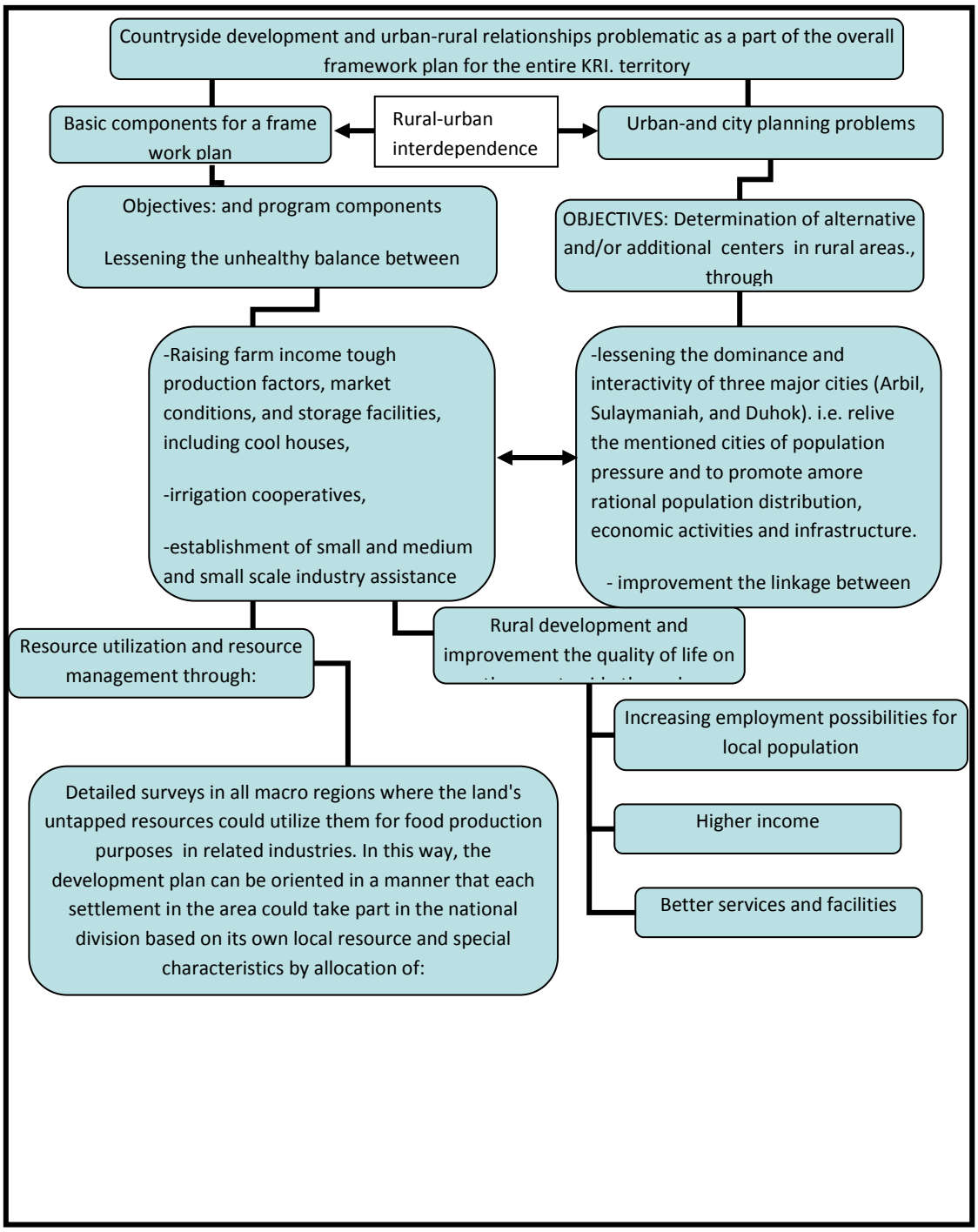


Fig.6, schematic presentation the components of a comprehensive framework plan concluded as a real consequence from the phenomenon (process): high out migration from the countryside(presented in (fig. 1) and high concentration in the three major cities Arbil, Sulmanyah, and Dohuk

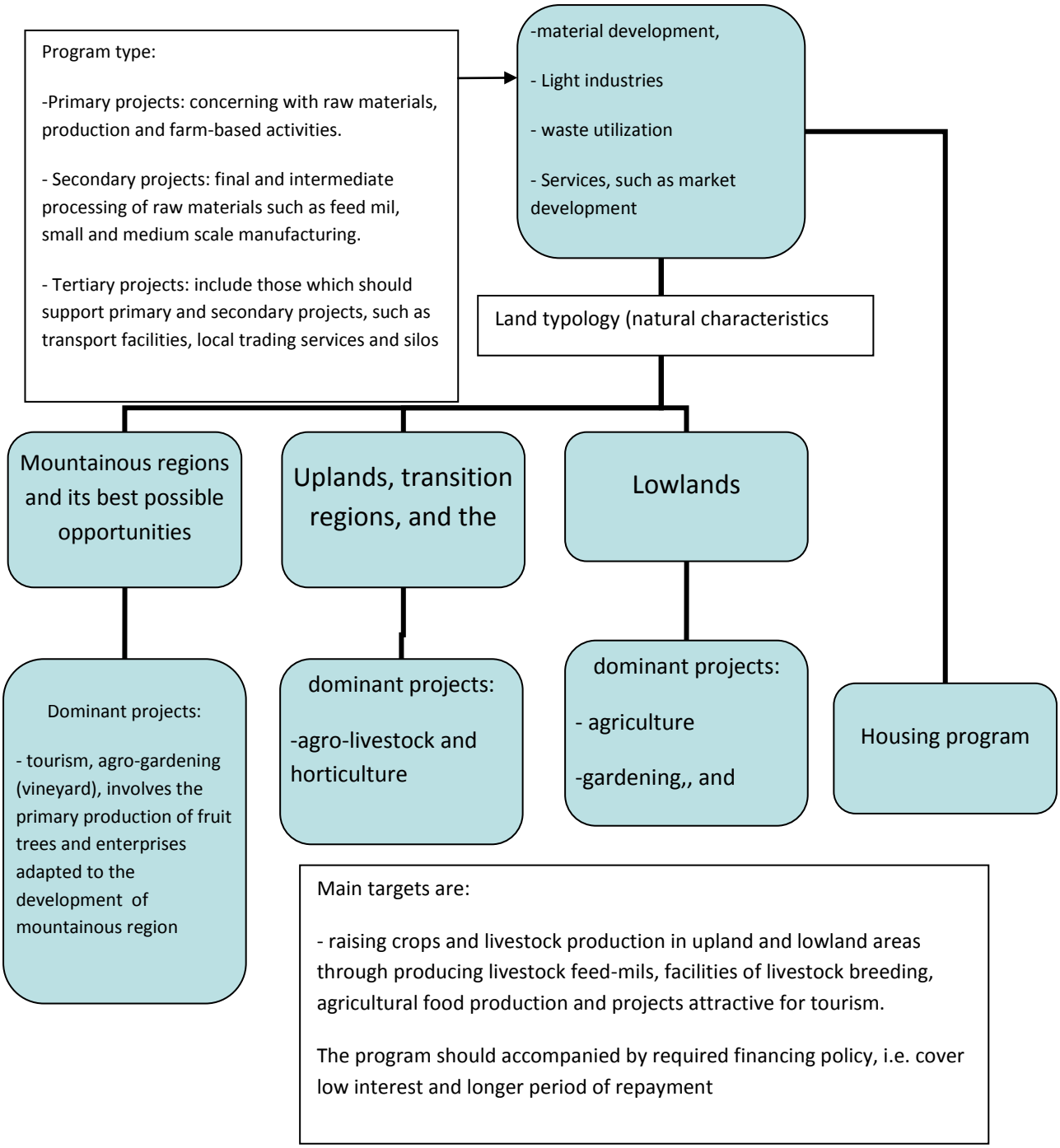


Fig. 7 planning measurements presents three main components of the livelihood development program on the countryside. The program parts designed in accordance with existing natural endowment and topography characteristics the availability of human and natural resources. In this way, each program part gets a mutual benefit from the two others and have all together an integrative and coordination characters that increases the grade of success of the program as a whole.

4. RESULTS AND DISCUSSION:

The section, materials and methods and the qualitative data entered in the tables 1-11 followed, showed clearly the planned and logical combinations and efficient use of both

natural resources, Land and Water, adapted to the different existing natural endowments. The total available annual renewable water based on total area of the territory 55751.75 ha was 442.144.829 million m^3, from which 793.06 million m^3 was rainfall (see tab. 11). The estimated amount of water for providing the required water for irrigation the whole agriculture area (7147 ha) and with average water requirement 700 mm is 50.029.000 million m^3. Percent investment of water for irrigation of all agricultural area from annual rainfall is:

50.029.000 / 442 .144.829 * 100 = 1103 %, whereas the investment of dry farming lands was 74.90%. The abundant land for diverse land investment and adequate ways of water harvesting enhance first land productivity in agricultural and tourism sectors followed by building sector. Indeed the tourisms and agriculture sectors are capable to provide sufficient working possibilities for inhabitants in the countryside that opens the way for many youth people to return to their home villages and initiating gradually the reconstruction and repopulation process of the countryside. Reconstruction process forced furthermore other linked economic sectors and gradually the restoration of destroyed balance between urban and rural areas becomes a real possibility. The maps 5-7 should support the above statements where the natural conditions and relative population density in the study area was shown. The obtained results from tables 1-11 supports by the data attached to maps 2-5 which represent the combined factors of temperature, humidity, precipitations, and evaporations. So fig. 2 shows an average of temperature during the the years 1984-2009, according to recorded data station of Ducan dam. The highest recorded temperature was in July followed by August. The minimum temperature was on January 4.4 c^o. High temperature during the growing season increase water demands and thus affects negatively the available water resource of the region through increasing the process of the evapotranspiration [7]. All these facts, mainly positive, facts, were used to prepare a regional-wide livelihood development program. This development program follows the principle of the spatial allocation of forces of production or resource availability and resource management respectively. In this regard and under consideration of the components of framework plan presented in fig. 6 there are two main development program-sectors, as follows:

An Agra/industry-cum-livelihood program that produce and provide the daily domestic basic need products to a level of self-sufficiency. Housing and settlement planning program as quasi housing-cm-livelihood program. Both programs are aiming to mobilize the local resources for a:

i- successive transforming the villages/ rural settlements into a self-relined productive communities, where various lively-hood projects could be established owned and managed by local residents themselves and thereby make, ii- the establishment of a solid and healthy base for light industries possible that could produce latter manufacturing goods for domestic market. Thus the livelihood-development program is quasi multi-sectoral program comprises three main interconnected components. All the program components are suited to geographical realties (land typology) of the study area.

5. CONCLUSION:

The detailed discussion above showed clearly the position of the study area (in providing both material and immaterial resources) and its adapting possibilities in the changing local and global changes (fluctuations in water supply). Thus, it is to claim that the paper is above all like a manual showing a right procedure how to deal with the accumulated supply problems in Kurdistan Region Iraq through reconstruction and reactivating of the countryside. In this regard, the following is to be underlined:

1. The nature of the issue (supply basic needs and other daily articles) made necessary to emphasis first on both sectors agricultural development and related agro based industry. These planning action was designated as livelihood program (compare fig 7)

2. The study has worked out real planning possibilities that ensure providing the eleven basic needs for the population and the integration planning measures of all the institutions coming in question at the same time. These eleven basic needs are: Water, power, food, medical services, livelihood, industries for manufacturing for domestic market, education; cultural and technology, ecological balance, shelter (housing and land use), mobility (roads, transportation, and communication), sports and recreation" [1 p.283]. The provision of these basic needs is the function of the type of land uses, as explained through land typology and planning measurements, which explains:

The availability of natural resources (resources for the development of industries, agriculture and recreation) and manpower resources

The type and availability of connections to the national and regional transport and other infrastructural networks and other services and the availability of local building material.

The availability of local building material

For every parcel land in the study area, a useable application is available, so that a complete harvesting of land in secure, for each three common sectors agriculture, and related food industries.

With refer to tourisms sector it is important to note that the study area, provide also possibilities especially for citizens from middle and south Muhafats of Iraq.

In case of water shortage either naturally (dry season years) or political motivated due to regional water distribution, as mentioned by research problem, it is possible to increase grain import to reduce water needs.

Managing and maintaining water required a better regulation within a legal framework.

Finally there are at least three other territories with similar and even better conditions present in the study area, identified, so that the here presented approach could be transferred there with a great success. These territories are within the administrative territories of the Muhafazt Halabja.

Some suggested scenarios with a special respect to water use:

Policy dialogue models will help in planning for future development. The suggested PODIUM is planning to cover the complete usage of land and water.

First scenario: If the half area of the available land used for agricultural development 14294 Donum or (3573.5 Ha) from the total agricultural land 7147 ha. Cultivate with Rice in summer Season with water requirement 880 mm/ season or 31.446.800 million m^3 and with estimated yield 5 tons/ Donum (20 ton/ha) estimated the yield of rice will be 71.470 tons and the net yield of rice will be 42.882 ton on the basis of net rice 60%. This yield will be enough for providing rice for 714.700 persons on consumption basis of 60 kg/person/year.If the other half of the agricultural land cultivated with sunflower with water requirement 700 mm/season, which is equivalent to 25,014,500--million-m^3 water and with estimated yield one ton seed/ Donum, the estimated production will be 14,294, 000 ton sunflower seed.

Second scenario: If the 7147 ha agricultural land completely cultivated once with wheat in winter season, with four supplementary irrigation with 50 mm for each one, or 14, 294,000 million m^3 water and with estimate yield of wheat seed 1 ton/ha, the total wheat yield will be 28.588 ton. this will provide bread flower for 238,233 persons, if the yearly consumption is 120 kg/person/year.

Third Scenario: If all agricultural land 28588 Donum (7147 ha) cultivate in the summer season with rice with water requirement 880 mm or 62,893,600 million m^3 with the production of 5 ton/ Donum and yearly consumption 60 kg./year/person it will be possible to provide rice for 1.4 million person/year.

Fourth scenario: Supported by scenarios 1 - 3, we can plan for construction diverse factories such as dairy production, poultry, cows, sheep, and follage for animals.

6. RECOMMENDATIONS:

On the base of the facts given and the conclusions, the following recommendations are worth underlining:

1-Since the real application of the research is the natural environment so its protection must get the first priority.

2- Protection of the farmer products from imported Agra-products from borderlands in form of price guaranty.

3. As the issue is countryside relevant issue, so the emphasis placed on development of agricultural and related agro- and milk processing industries which in their turn sets the process of housing in motion and combat both rural and urban problems.

4. Promote researches on natural resources, industry location, village location, village development, and tourisms. Here the co-operation actions of the related ministries required to discuss these issue in details.

4. From the background of the possibilities to transfere the obtained results of this research to other localities in Kurdistan Region Iraq, the following can be recommended:

4.1. The KRI needs more large dams, as stated also in the planning strategies of the ministery of agriculture and water resources. Currently there are seven large dams under negotiation with foreign companies, which will be implemented via long-term loans [3]

4.2. starting a region wide water saving actions, including the introducing of products which need little water and provide heat resistant abilities at the same time

5. Promote researches with regard to sustainability development.

In the end, it remains to hope that the emerge of a new institutional- and administrative era (since 1991 in Iraqi Kurdisatan that has sited up a new administrative institutions, and bring about an adequate budget, sufficient enough to develop the land in general and reconstruct the destroyed country side in special, as presented in this case study

Reference:

[1] National Human Settlements Institutinal Arrangements / United Nations Centre Settlements (Habita) Narobi 1987

[2] G. TYLLER MILLER ,JR / Living in the Environment Princiuples, Connections and Solutions, THOMSON- BROOKS/COLE 2010 Canada;

[3] Ministry of agriculture and Water resources of Kurdistan Region Iraq (KRI) Web site

[4] Sigert, 1994 , Introduction to water harvesting , Proceeding of the FAO expert consolation , Cairo , Egypt , Roma , Italy , FAO

[5] Ali , J. J , 2008 . water resource and its utilization for agricultural development in Sulaymaniah governorate . PhD thesis / University of Sulaymaniah .

[6]. Food and agricultural organization / 2010 / Guide lines for land use Planning – Roma , Italy.

[7] Ali , J. J and watman, M. land , water investment and sustainable water requirement in Tanjarow. Journal of University of Raparin , No , 9

[8] Middleton and Thomas , 1969 . world Allas of desertification , Arnold , Landon .

[9] Ali , J. J , Saber, S and mohammed, K-R- 2017 land and water investment in Qaradakh territory. Journal of Raparin University No. 10.

[10] Iraqi Kurdisatn Region, Ministery of agriculture and water resources- Sulayamaniah governorate.

[11] Iraqi Kurdisatn Region, Ministery of planning, Sualymaniah statistic directorate.

[12] Effect of geographical 2015 factors on utilizing land use , under dry farming in Iraqi – Kkurdistan region , IJISET, vo1 , 2 , Issue , 8

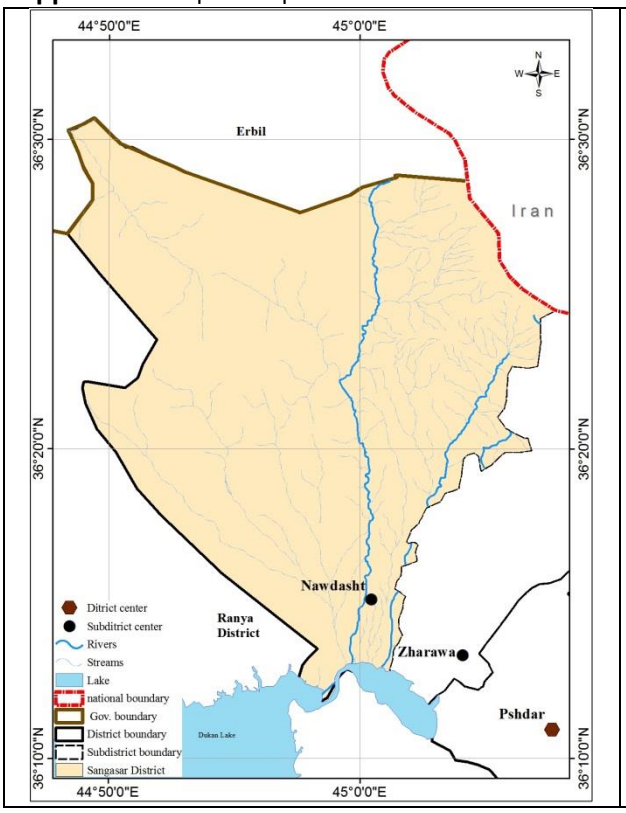
[13] Ali , J . J 2012. Water harvesting through investment of wild hawthorn, for production different fruits under rain fed condition of Koya university, No 23.

[14] Ali , J.J ,2012 water harvesting. through investment of wildhawtuern, for production of different fruits under rainfed condition .Journal of Koya University , No.23

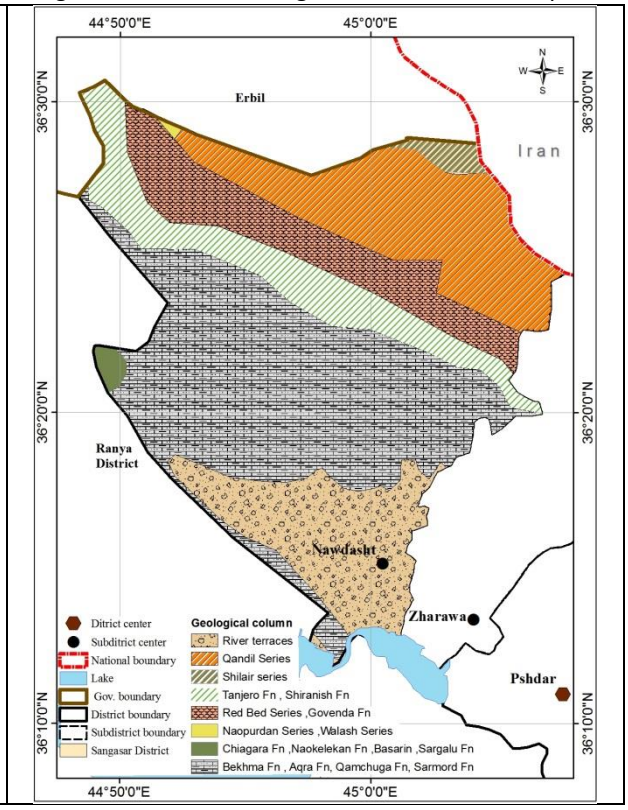
[15] Ali , J . J 2012, utilizing wild Almond rootstocks for water harvesting in Sulaymaniah region- Journal of Koya University Vol. 19, No. 3

[16] Living in the environment: Principles, Connections and Solutions. G.Tyler Miller, JR 13th edition. THOMON BROOKS/ COLE, 2014 Canad

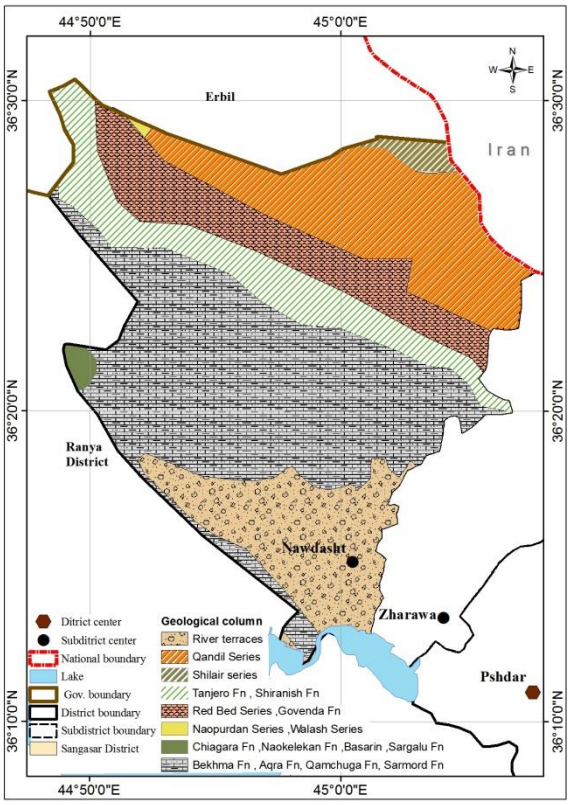
Appendix 1 map of Iraq shows the location of Kurdistan Region with rivers flowing downstream into Iraq.



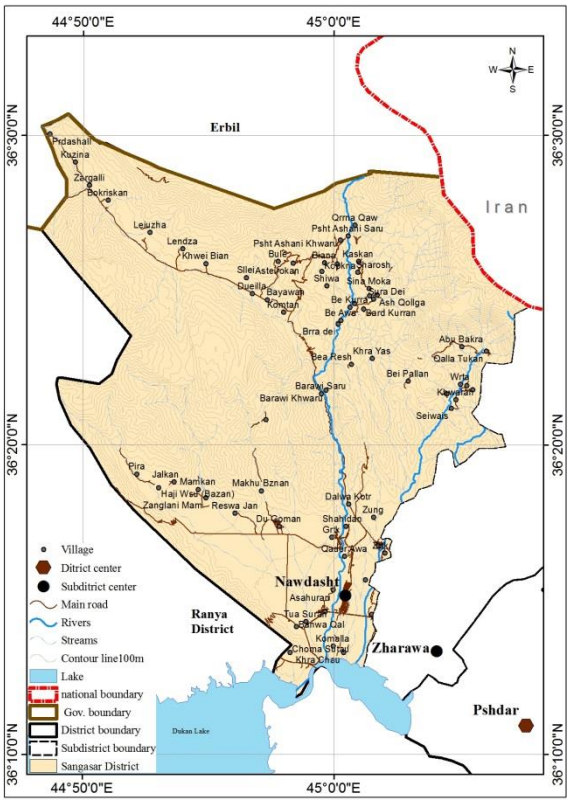
Appendix 2, Map shows the geographical location of Sangasar (Nawdasht)



Appendix 3, Map shows the topography of Sangasar (Nawdasht) Villages



Appendix 4, Map shows shows geological formation villages Sangasar (Nawdasht) Villages



Appendix 5, Map shows the administrative Sangasar (Nawdasht) Villages