

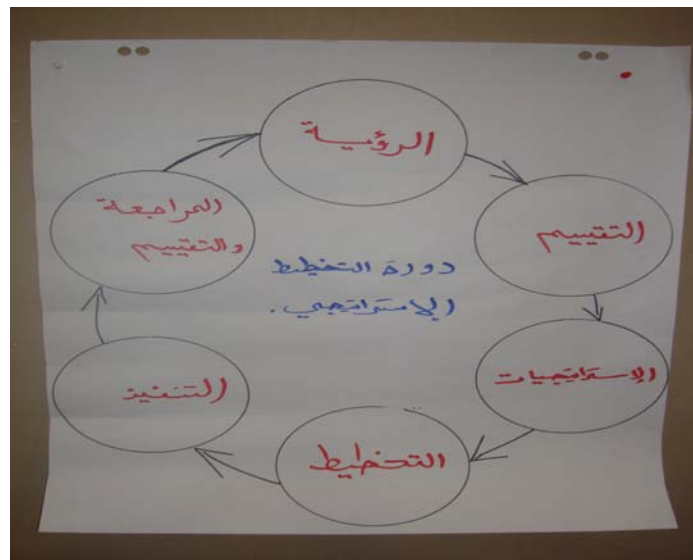
Participatory Rapid Appraisal “2009”

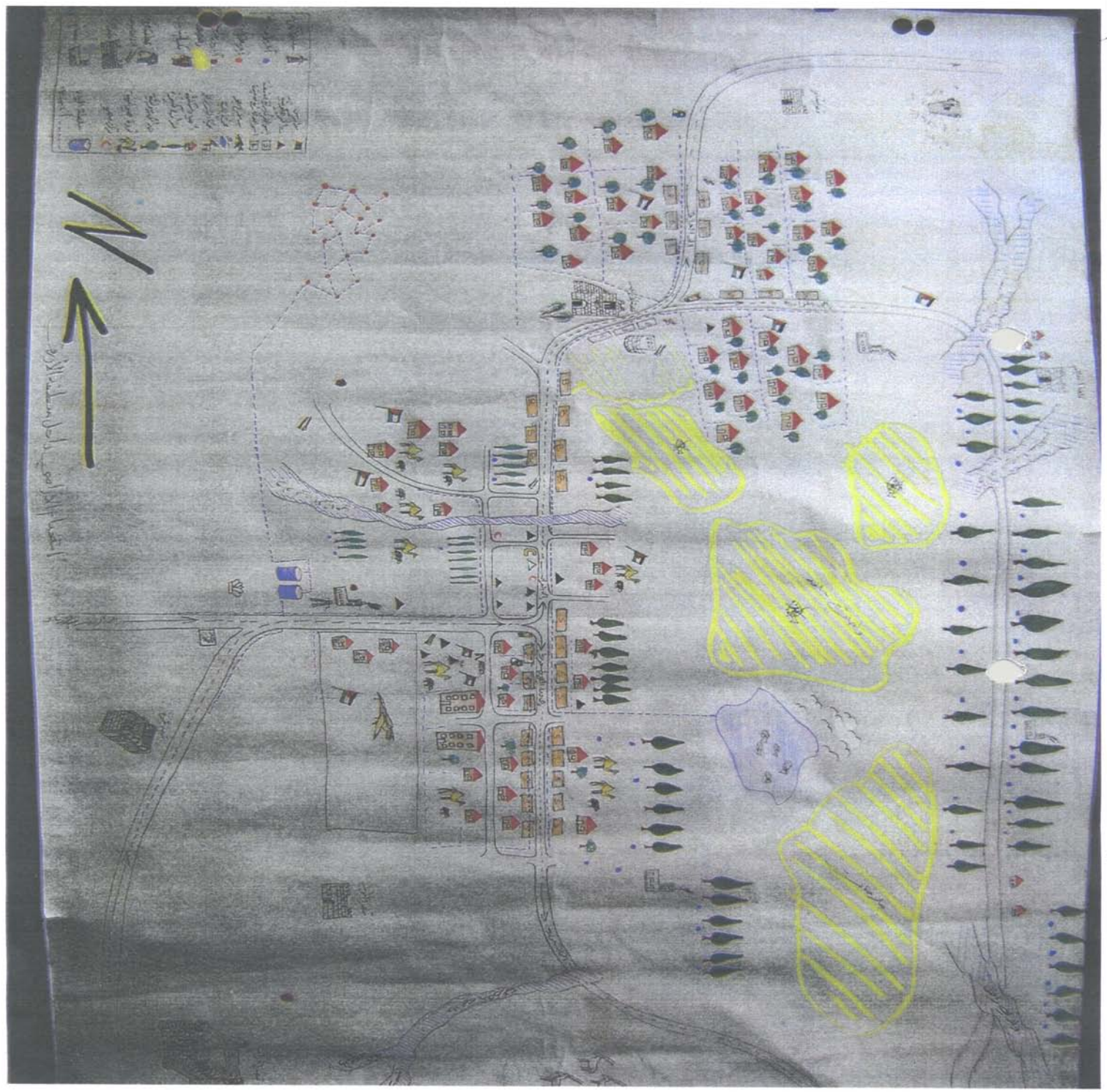
Implemented by:

Azraq Water Resources Management Committee

Arab Women Organization (AWO)

Badia Research and Development Center (BDRC)





- Introduction

1. Aim and Subject of the Research

A Field Research was implemented in Azraq area by the International Union for the Conservation of Nature (IUCN/ ROWA), the Jordan Badia Research and Development Centre (BRDC) and the Arab Women Organization (AWO) in collaboration with the Azraq Water Resources Management Committee/Azraq district. Related Stakeholder participated, including: the Social Development Directorate, Agriculture Directorate, Water Directorate, Bureau for the Management of the Water Basin, , Education Directorate, Health Directorate, Azraq Municipality, Azraq CBOs (Cooperatives, Voluntries),the District Office as well as individuals from the local community.

A training workshop was conducted to train the team on the methodology of the Participatory Rapid Appraisal (PRA) and its tools in theory and practice. During the workshop, the participants designed the research plan to be implemented in 10 days duration. The training workshop was held in Azraq Municipality Library.

The overall objective of the training was to draw a clearer picture of Azraq situation and get a better understanding of the water situation in Azraq.

The Specific Objectives

- To set the main outline of the Azraq inhabitants' needs
- Use the findings of the research as a base for decisions and future planning by the team of the Azraq Oasis Restoration Project and the Water Resources Management Committee.
- Agree on unified information between the officials of the different government directorates and the leaders of the local community.

2. Methodology

The Participatory Rapid Appraisal (PRA), which was used in this research, is a method used for developmental issues. It appeared towards the end of the 70s & the beginning of the 80s as an alternative and a complementary to the existing research methods. PRA is considered as an educational method for all individuals to discover, analyze and evaluate the challenges and opportunities and adopt attitudes towards projects and development programmes. It is a tool that enables the research team to collect information in a rapid and organized way to be used in evaluating the needs of the inhabitants and analyze the general situation.

PRA is indebted to anthropology and ethnographic. In this method it's more important to get better understanding of the complexity and depth of a certain subject more than getting

actual statistical information of a list of tens of variables. It is similar to conducting surveys, which are the most common social research methods. It is also concerned with understanding the specific qualitative differences as well as the societal opinions and attitudes in order to comprehend the ambiguous changes in local communities.

It is well established that PRA is an effective tool when applied on rural and Bedouin communities that have more harmony in knowledge, values and doctrines as when it is applied in the more complicated urban areas.

This method is characterized by:

- Flexibility:

PRA uses a variety of tools that the local community members can learn easily and needs little expenditures. That is why it is looked at as a technique for research and harmony because it is distinguished for its precision without any unneeded extra information. This method enables the researchers to adapt to the change in activities and to the use of tools according to the prevailing conditions.

- Triple observation

The PRA revises and examines the data in a triple way. First, data is collected by the research team, which includes a diversity of people, men and women from inside and outside the community with a variety of experiences and skills. Secondly, data comes from various resources whether different places or different events or different social sectors, like the elders and the young. Thirdly, it has a variety of tools to collect the data.

- Participation

This is the most important part of PRA as it is based on learning from the inhabitants of the local community. Contrary to all other kinds of research, PRA is carried out inside the local community by the participation of all its members. Participation starts directly after defining the subject and the tools and goes on till the final analysis of the data. Efforts are exerted to encourage the participation of representatives of the different sectors, especially those who will use the results. Priority is given to the time needed for analysis.

3. Research Team

The research team consisted of specialized men and women with diversified practical experiences as well as individuals representing the various groups of the local community. In fact, the representatives from Azraq local communities formed the core of the research team. Thus, PRA methodology ensured the participation of all stakeholders in designing the research plan, the use of the special tools and the analysis of the findings.

Hereunder, a list of the official and community representatives in the research team:

Name	Position
Mr. Adnan O'toum	Director of Azraq District
Dr. Ibraheem Al-Ateem	Director of Agriculture Directorate
Eng. Kamal Ata	Azraq Mayor
Eng. Muhammad Al-Hawi	Field Director of Azraq Basin
Dr. Odeh Al-Masa'eed	BRDC
Mr. Hussein Arsalan	Directorate of Land and Surveys
Mr. Naeif Al-Afeer	Azraq North Women Organization
Ms. Barmakieh Is'eed	Rural Women Empowerment Org.
Ms. Nofa Al-Fayez	Azraq South Women Org.
Mr. Nazeeh Al-Bassar	Azraq Cooperative
Mr. Turkey Al-Afeer	Azraq inhabitants Organization
Ms. Fatima Al-Dagamseh	Azraq Basin Office
Mr. Osama Tarabeh	Azraq Municipality Council
Mr. Mansour Al-Shoshan	Azraq Municipality Council / Representative of the Bedouin Skhour Tribe
Mr. Talal Ata	Azraq Municipality Council
Mr. Muhammad Issa	Chechen Voluntary Society
Ms. Meitha Salim Al-Sabra	Directorate of Social Development
Ms. Samia Al-Balous	Azraq Women Cooperative
Ms. Najah Damen Ata	Azraq Women organization
Ms. Sitelkul Al-Shomari	Azraq Cultural Club
Mr. Shaker Al-Sarhan	RSCN
Mr. Muhammad Al-Chechani	Azraq Cooperative/ Representative of the Chechen
Mr. Rabee' Al-Bahri	Azraq Health Centre
Mr. Ra'fat Tarabeh	Azraq Agriculture Directorate
Ms. Rida Al-Younis	Women's Committee Forum
Mr. Nu'man Al Shishani	Azraq Municipality Council
Ms. Eman Al-Tawaiha	Azraq Women Organization
Mr. Othman Dawlat	Azraq Municipality Council & JES
Mr. Amin Suleiman Al-A'war	Deputy Mayor
Mr. Muneer Dogan Fadlalah	Azraq Secondary School

4. Research Plan

The design of the research plan consists of 4 major topics to study the situation and the needs of the inhabitants. Each major topic is divided into minor topic to make it easier to deal with according to the information revision list. Then, the tools for each minor topic were chosen.

- Social and Economic Situation

1. Family structure (whether husband and wife are relatives, who is the breadwinner, who works, etc.)

2. Number of family members
3. Number of wives
4. Males and females
5. Education
6. Extended or nuclear family
7. Role of social institutions (Water Management)
8. Social problems (disabled, divorcee...) and problem analysis
9. Income, number of productive members, income resources, expenditures (ration of water expenditure)... Invoices
10. Ownership (house, role of social projects and loans, productive projects in Azraq)
11. Employment
12. Small projects
13. Economic problems (Ex: unemployment, culture shame...)
14. Civil Society Organizations in Azraq (NGOs and their roles)
15. National Welfare that is affiliated to the Ministry of Social Development (MOSD)
 - Health Situation
 1. Diseases: Kinds and causes
 2. Health institutions: Role and effectiveness (institution analysis)
 3. Health problems
 4. Water causing health problems (If present)
 5. Health insurance (kind)
 - Environmental Situation
 1. Ways of disposing bio waste
 2. Ways of disposing solid waste (containers, landfill...)
 3. Kinds of sewage system (Septic, non Septic tank...)
 4. Insects problem, rodents, flies (Causes and combating)
 5. Dust problem and fire
 6. Local combating institutions and their roles
 7. Role of the community in preserving the environment
 8. Soil salinity
 - Agriculture Situation
 1. Number of farms and their areas
 2. Numbers of trees and kinds
 3. Areas planted with field crops
 4. Chicken farms and their production capacity
 5. Fish farms and their production capacity
 6. Number of licensed water wells and the unlicensed
 7. Water quantity extracted from licensed water wells
 8. Water quantity extracted from unlicensed water wells
 9. Water quantity extracted for drinking and its monthly ratio

10. Quality of drinking water extracted from Azraq Basin
11. Quality of water used for agriculture and its ratio
12. Number of Jordanians working in the farms
13. Number of families living in the farms and their nationality
14. Number and sex of farm workers from Azraq inhabitants
15. Number of expatriate agriculture workers
16. Quantity of Azraq agriculture products and quantity of the exported
17. Special qualifications of Azraq agriculture products
18. Agriculture patterns in Azraq
19. Soil qualifications in Azraq
20. Marketing channels
21. Role of agriculture guidance
22. Agriculture needs for water
23. Dates of plantations
24. Most important agriculture diseases and pests
25. Fertilizers and pesticides that are used
26. Irrigation systems
27. Agriculture seasons
28. Knowledge of frosting dates
29. Areas of fertile lands
 - Water Situation
1. Waste water
 - Kind of sewage system (Septic, non septic, location, whether old wells are used as sewer)
 - Capacity of septic tanker, number of annual exudation and cost
 - Problems of sewage (Smell)
 - Are there common septic tanks
2. Drinking Water
 - ◆ Quantity of used drinking water (water bill)
 - ◆ Quality of drinking water and the level of acceptance by the community
 - ◆ Capacity of water reservation for the family
 - ◆ Ways of reserving water
 - ◆ Number of weekly hours of water pumping
 - ◆ Precision of water meters
 - ◆ Cost of participation
 - ◆ Regularity of water distribution
 - ◆ Water quantity for the individual per day
 - ◆ State of the water network
 - ◆ Distance of the water network

- ◆ Water prices
- ◆ Water resources
- ◆ Water harvest methods and the capacity of the water well
- ◆ Number of the participants in the water meter
- ◆ Institutions for monitoring drinking and irrigation water
- ◆ Quantity of consumption related to season (summer or winter)
- ◆ Livestock and water consumption
- ◆ Gardens' consumption (Quantity)
- ◆ Purpose of using drinking water (washing, cooking, drinking)
- ◆ Requests for drinking water
- ◆ Citizens knowledge of the pumping program

5. Detailed reports on Azraq Areas as included in the research (Azraq North, Azraq South, Centre, Hamzeh Quarter and Al-Mazari' area).

Azraq North: The biggest inhabited community in Azraq as it is the oldest inhabited by people. It is located in the north district inhabited by the tribe of Bani Ma'rouf (Drouz). Within this area, there is the Municipality building, the District Offices, some of the Governmental Directorates and Schools. The population is around 7000. This area includes the old castle and the old palace as well as educational and professional centers. Azraq north is connected by paved roads. From south, there is the Amman-Aqaba road and the road to Saudi borders. From north, there is the road to Safawi and the Iraqi borders.

Azraq South: It is in the southern part with around 3500 inhabitants composed out of the Bani Sakher tribe and the Chechen minority. It is considered as the trade quarter because it is located on the road between Aqaba and Iraq. It includes the rest houses, restaurants, passengers' service spots. It has some schools for boys and girls. It has the building for the new municipality, the agriculture directorate and several headquarters for the NGOs, in addition to the Azraq reserve & Shomari Reserve.

Centre, Hamzeh Quarter: The Centre includes the urban development area, which is 20 years old and located between Azraq north and Azraq South with the least number of inhabitants, 1200 mostly from the Zayadi tribe. They are composed from the families that came from Iraq and Kuwait during the Gulf war. They were given the land and the urban development houses by a royal decree to assist them to merge. They depend on trade. It includes, Hamzeh Quarter, which is inhabited by Al-Hweitat tribe and has 3 schools.

Al-Mazari' Area: It is the fourth area in the research. It is the specialized area in farming. It is the biggest agricultural area, but little is owned by the Azraq inhabitants. Most of the farms are owned by people from outside Azraq (Investors), who are the largest sector in agriculture. The investors build houses within their farms just to spend their weekends. The water sources for drinking and irrigation are the artisan wells. The land is still unlicensed as it is considered tribe interface land. Azraq inhabitants depend on these farms to maintain their needs for agricultural products and employment in some farms.

Azraq District

- Location

Azraq area is located in the Jordanian Eastern Badia with an area of 3500 square meters. It is affiliated to Zarqa governorate administratively. The population is around 12500 inhabitants. It is surrounded by Mafraq from the north, Amman from the South (120 km). It is divided into the following administrative areas: A-Mazari', Al-Ein Al-Baida, Um Al-Masaeil, Air-base Housing, Azraq North,, Azraq South, Al-Umari and Al-Dgheila.

Azraq is considered part of Ramsar convention, because it is located in an underground water basin with 12700 km. This basin is one of the most important renewed water resources. It is 500 meters above sea-level.

- Climate

The climate is an arid and semi-arid one. It is a typical Jordanian Badia climate with less than 100 m of rainfall and with a temperature between 35 to 50 in summer and zero in winter.

- Available Services

Being administratively related to Zarqa governorate, many services are provided in Zarqa like the hospital, electricity, education directorate and others.

Inside Azraq there are:

- District Directorate
- Municipality department
- Agriculture Directorate
- Civil Security Centre
- Badia police Centre
- Health Centre
- Drinking water department
 - Water basin department

- Social development office, including:
 - a. Non-Governmental Organizations
 - b. Cooperatives
 - c. “Irada” and other establishments
 - d. Water reservation and the “Shomary” reservation
 - e. Tourist and archeology Bureau
 - f. Public Work Office

The district is served by a net of paved roads in the different directions. There is a water network, an electricity network, telecommunication network, shops, restaurants and tourist places.

The education sector has 3 boys and girls schools in Azraq north. There are two schools in Azraq south. There is one school in Hamzeh quarter and two schools in the urban development area. There is one preparatory school and a co-educational elementary school in the Airbase area in Al-Mazari.. The education sector provides several specialties and courses.

- Socio-economic Situation

The aim of researching Azraq socio-economic situation is to reach an analysis for the number of the families, relations between husband and wife, number of children, number of disabled, social problems, education ratio and the culture of shame.

The research team divided Azraq into 4 areas; Azraq Noth, Azraq South, Centre and Hamzeh quarter and Al-Mazari’.

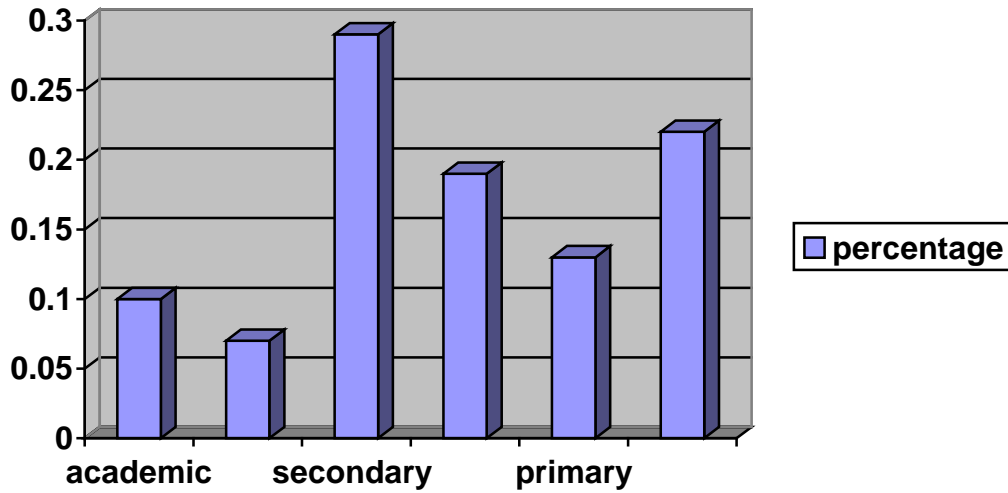
Research findings indicate that the nuclear family is the base with few extended type of families. Life age is up to 70 years and the average of family members is 9 (the highest in Jordan). Polygamy is not common and reaches 2% only.

The level of education, according to the research team remarks, is high in the compulsory and secondary levels. The ratio in the compulsory cycle reaches 32% and in the secondary reaches 29%. As concerning the higher education, it reaches 7% and university enrollment is 10%. The ratio of illiteracy has reached 22% as in the attached graph.

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As for women education in Azraq, it has been noted that some have finished the elementary level, a few have finished the secondary and few had finished the university graduate level. Higher education has enabled women to work in the different government directorates while the rest are housewives devoted to perform house chores and upbringing of children. There are no productive or profitable projects, in spite of the fact that there is an office for Irada (Ministry of planning service center for community) and another for the RSCN “Royal Society for

Conservation of Nature).



The culture shame is so high and reaches up to 92%, according to the sample.

As for relations, it was found out that 48% of the families are not relatives and 46 are relatives. There remains 6 % with unclear kinship relations.

It was confirmed that 65% of the inhabitants have not recognized the effective role of the NGOs against 35% who recognized the impact of NGOs and their effective role. The research team has come to the conclusion that unemployment, is between 2 to 8 % due to the absence of productive institutions and the long distance from Amman.

The male and female ratios are so near: 49% for the males and 51% for the females. The house owners are 83% of the population, whereas 15% reside in rented houses and 2% live in tents.

PRA "Participatory Rapid Appraisal" has disclosed that the family income comes from governmental salaries, which reaches to 28%. A ratio of 26% persons depends on their own enterprises. A ratio of 20% depends on the Aid-Fund and 17 on pensions. A ratio of 3% depends on livestock and 4% on 5% on artisan professions.

As for the monthly income, 41 families out of the sample earn an average that ranges from 40 to 150 Dinars, which comprises 20% of the sample. 73 families earn 150 to 300 JDs, which comprises 36% of the sample. 34 families earn 301 to 450 JDs, which comprises 17% of the sample. 55 families, which is the largest number, earn 450 and above, which comprises 27% of the sample. As in graph 2



As for the expenditure, the survey indicated that expenditure goes as follows: water 15%, health 2%, education 2%, house rent 5% and living materials 4%.

The most important socio-economic problems in Azraq are:

1. Drought in the oasis with continuous growing of desertification and dust, which weakens tourism
2. Decreasing in water supply, the rise in water price and the low water pumping increase the family expenditure because families have to keep house tanks with pumps to reserve water and then pump it to tanks on house roofs
3. Health problems are caused by the existence of only one policlinic with less than needed practitioners to respond to the demand. So, more expenses are needed to travel to Zarka or Amman to receive health care.
4. Education problems are caused by the lack of enough teaching cadre, which negatively impact the teaching level and the ratio of success in certain courses. So, people pay more to send their kids to schools in Zarka.
5. The long distance from Azraq to Amman is the central cause of problems. So, the inhabitants have to pay more to go to universities, factories and government directorates.
6. The sewer problem due to absence of sewer system. So, people suffer from pollution and the presence of insects and rodents.
7. Land problems are caused by clan interface, which means not licensing the old divided pieces among the people. This diminishes land for housing and automatically raises the house rent and lead people to migrate.
8. Lack of enough developmental projects leaving people to suffer from unemployment and dependency on the welfare fund.

9. Weakness of the role of the government directorates leading to material and social losses and chaos in water consumption and plantation.
10. Stop extracting salt from the salty basin, which used to be an income source for living but stopped to increase unemployment.
11. Absence of universities and colleges, which increases the cost of teaching and lower the teaching level.



Graph 3 indicates the ratios of family expenditures.

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lth conditions;

Out of the survey findings, it is discovered that a high ratio of people are without health insurance. The ratio reaches to 54.6%. This make people spend more money on medical treatment. The highest number of those insured is 22% from among the public employees, whereas the ratio of those insured by the military medical services is only 18.8% and the private insurance is only 4.6%.

As for the health centers, it was discovered that:

- There is neither a public nor a private hospital in the area, though Azraq is located within the eastern border area that leads to Iraq and the gulf.
- The Azraq comprehensive health center (Polyclinic) is just a sign without a real presence of specialized doctors or clinics or maternity section or a renal unit. Even the lab does not perform all the medical tests.
- There are no specialists among the physicians. There are only 2 general practitioners in Azraq south with 3 private dentists.

Therefore, it was found out that the percentage of those unhappy with the health services of the polyclinic reaches to 66.6% out of the sample.

Whenever there is a critical health problem, it is referred to Zarka at a 90 km distance. The cost turns out to be high because the people themselves pay for the trip. Unfortunately, in some cases people lose their lives before reaching Zarka hospital.

It was noted that the ratio of the chronic diseases is high, such as blood pressure, 21.3%, diabetes 20.4% and renal failure 13.5%, this might be caused by water pollution and the sediments in water.

As for the pharmacy attached to the polyclinic, it always lacks essential medicines. That is why people are obliged to buy their medicines from 4 other private pharmacies. The private pharmacies are located as follows: 3 in Azraq south and 1 in Azraq north. They also suffer from constant shortage of essential things, especially the children's milk.

The graph below (table 1) shows the health Insurance in Azraq

Health insurance: 45.4% insured and 44.5% not insured

Table 1 is based on a sample of 214 persons

Number in village	Gov. insurance and percentage	Military insurance and percent	Private insurance	Without insurance
90 in Azraq North	27 30%	32 35.6%	7 7.8%	24 26.5%
40 in Azraq South	12 30%	7 17.8%	2 5%	19 47.5%
50 in Center	14 28%	11 22%	3 6%	22 44%
34 in Almazari	0	0	0	34 100%
214 in Total	53 88%	50 75.4%	12 18.8%	99
	22%	18.8%	4.6%	54.5%

Illustration of health care in Azraq of a sample 180

Chronic diseases	Percent	Seasonal diseases	percent	Others	No. of cases
Blood pressure	21.3	Sensitivity	48.5	Skin diseases	6
Diabetes	20.4	Inflammations	9.3	Glands	2
Cardiology	10.5	Asthma	12.5	Lung	1

Arthritis	12.5			Stroke	1
handicapped	11				
Renal failure	13.5				
Cancer	1.5				
Sight weakness	3.5				

Environmental Conditions

Out of the Survey results and the data analysis, it was found out that there is one landfill for all the Azraq area located 4 km north of Azraq north. The landfill is 150 dunum in area (dunum is 1000 square metres). However the landfill is scattered without any general safety procedures. Moreover, it is nearby the resident area affecting the residents with bad smell. This is caused by its geology as it is located over rocky land. Unfortunately, the landfill location affects the drinking water wells under the control of the water directorate.

As for the disposal of waste water sucked from the sewer holes, this is done by tankers, which dispose of it in scattered areas less than 3km from residential areas. The ratio pumped from hollow holes is 72.2%, whereas from not hollow holes is 17.8%. Waste water goes to open land affecting the drinking water wells and the irrigation wells. 90% of Azraq inhabitants complain

As concerning whether there is a slaughterhouse or not, the answer is not. There is no licensed slaughterhouse, so slaughtering is carried out at the butchers', restaurants or at the main road leaving bad smell of the left parts as well as insects and rodents, especially in Azraq south, where most of the restaurants and rest houses are located for passengers to the Gulf area.

Desertification, dryness and excessive dust

The cause of the increase of desertification is the growing decrease in rainfall in Azraq Oasis area and the increase in dust. It was found out that 47.8% of dryness and 48.5% increase in dust have been caused by:

- The over pumping of water from Azraq basin by the water authority and the farmers have led to the disappearance of surface water.
- After stopping to excavate salt from the salt water basin, salty water penetrated to the fresh water basin. This caused the increase of salt in the underground water.
- Increase of building scattered dams on valleys that bring water to the bottom. Water in valleys used to feed the basin and diminish dust.
- Climate change and shortage in seasonal rainfalls
- Increase in sand dunes

Rodents

More than 63.6% of the population suffers from rodents because of:

- The big number of open sewer holes
- Warehouses for fertilizers, which are not firmly closed
- Mishandling of organic materials by farmers
- Improper compiling of waste in the landfill
- The passing of lorries carrying cereals and organic food
- Absence of control of insects

Insects and mosquitoes

It was found out that 87.5% of the inhabitants suffer from insects and mosquitoes due to:

- The big number of open sewer holes
- Mishandling of organic materials by farmers
- Scattered water ponds around broken water pumps of the old water net
- Slaughtering of animals at restaurants and butchers'
- Non-frequent campaigns of pest control by spraying.
- Scattered sewer stations

Saline Soil of 60.5%

- Non-excavation of salt from the salt water basin caused penetration of salty water into the fresh water. This has increased salt in the underground water and soil, especially in farms near the bottom.
- Over pumping of fresh water from the basin
- Climate change and decrease in seasonal rainfall

Pollution of drinking water of 25.8%

- 25.8% of the sample population complained of contamination in the drinking water due to the worn out of the water pipes. (old water net)
- The metal house water tanks are old and worn out
- Thick dust storms in the area

Bad smells of 26.3%

26.3% of the sample population complained of bad smells due to:

- Open sewer holes
 - Slaughtering of animals in scattered areas leaving parts of the animals

- Waste landfill and waste water station
- Dust and sever wind

Transportation and passengers cause pollution of 45.5%

- Emissions of cars and lorries
- Not enough toilets for passengers, especially at time of Haj
- Throwing litter at the sides of the road

Animals' residue

- Animals residue are used as fertilizers in farming but it causes bad smell and attracts flies and insects
- Shortage in the general services rendered by the municipality 10%, especially in providing containers and carry the solid waste
- Shortage in controlling flies, rodents and mosquitoes 28%
- Fire due dry branches of trees and dry grass 4%
- Cats and Stranded Dogs: 8 families out of the sample said that cats and stranded dogs are causing harm.

Water conditions

The manager of Azraq water basin declared that there is mixing between the fresh water basin and the salt water basin forming a dome-shape in the bottom, which is the lowest point in Al Azraq. The balance between the two basins in Azraq works in such a way that the decrease in the fresh water, due to over-pumping, increases penetration of salt from the salty basin in all directions.

Drinking water to Azraq inhabitants come from artisan water wells under the control of the Water Authority. There are 12 water wells that pump to provide Amman, Zarka and Azraq with water. The figure reaches 17690597 cubic meters annually. The average usage per family reaches 1566 liters per day at an average of 177 liters per person per day.

Water problems are many. Here is some:

- Absence of a sewer system, which reflects on the quantity per person and affects the quantity spared for irrigation. Over pumping from water wells causes saline soil and saline water in wells.
- Weak pumping into the old water pipes, which is under renovated, increases waste and leakage. Moreover, the inhabitants use pumps to push water to the roofs. In Azraq the waste in water because of the old pipes, reaches 70% leaving 30% to reach the houses.

- The problem of dust and very high degrees in summer oblige people to use more fresh water for bathing, house cleaning, air-conditioning, etc. This lessens their share for drinking water.
- Unlicensed usage of water is a problem, whereby unlicensed water wells are used for irrigation to lesson fresh water and thus increase saline water and saline soil.
 - Non-activation of laws and regulations to monitor usage of underground water. Azraq suffers from having unlicensed water wells which raise the level of over pumping of the water basin.

The following tables 3 and 4 show the analysis of water conditions: quantity of the wasted water, consumption, reaching houses, average of consumption per person, per family, per farm and the number of licensed and unlicensed water wells. Moreover, there are indicators of the quantity of pumping from wells, daily consumption of the person and the family per year.

Table 3: summary of water balance for 2008 in Azraq basin

Type of Wells	Number of wells	Active well	Not active	Pumping / cubic meter
Licensed for irrigation	266	180	86	5416259
Unlicensed for irrigation	628	286	342	15536350
Industrial and governmental institutions	12	11	1	708403
Drinking water	20	16	4	17690597
Remote are	11	11	0	
Total	937	504	433	39351609

Table 4: Analysis of the sample on water conditions

Area	Sample	Total Consumption / family /day	Number of Family Members	Average Consumption/ family/day	Average Consumption/ person/day
Azraq North	71	11202 Liter	627	1566 Liter	177 Liter
Azraq South	34	56276 Liter	286	1655 Liter	197 Liter
Azraq Centre	52	63368 Liter	475	1340 Liter	134 Liter
Total	157	230846 Liter	1388	4561 Liter	506 Liter
Al-Mazari	25	120500 c/m	482	12050 c/m	?

Agricultural Situation

The agricultural sector in Azraq is the pillar of the economic activity. It is the most important sector for the working force in the district. A high ratio of the inhabitants depends on this sector for employment, marketing of the agrarian products and the industrialization of the agrarian products. However, this sector is facing very complicated problems because of:

- Agriculture in Azraq depends on the underground water wells;
- Azraq receives very little rainfall with high temperature, which raises the water consumption and causes over pumping;
- There are no modern irrigation methods leaving farmers to primitive digging of scattered water wells;
- Farmers choose high-water demand types of plantations.

All this affects the economic situation of the Azraq inhabitants due to:

- Poor marketing
- Central markets are far off
- High prices for materials needed for production
- High wages

Therefore, the inhabitants asked for introducing the Jojoba tree due to:

- Low-cost at the plantation stage
- Low demand for water
- Economic feasibility.

The total area in Azraq is 3500 square meters, whereas the farming land reaches 68082 dunums. Moreover, the figures produced by the Ministry of Agriculture (MOA) speak of 90828 dunums. The fertile land is as high as 290000 dunums.

The Azraq inhabitants do not own the farms, except for a few. This is because the land is under clan interface. Most of the farmers are from outside Azraq. They form 91% of the farmers.

Azraq farmers totally depend on artisan water wells for irrigation. The number of these wells (licensed and unlicensed) is 894.

The Agriculture Directorate renders the following services to the farmers:

- issuing licenses/certificates for free of fees expatriate workers and cars;
- distribute seedlings of fruit trees;

- issuing licenses for shops, olive pressers, guidance services, vaccination of livestock, veteran treatment, planting trees on the sides of the road and the protection of the foster trees.

The following table shows the farming areas, fertile land, type of plantation, number of expatriate workers and the livestock quantity.

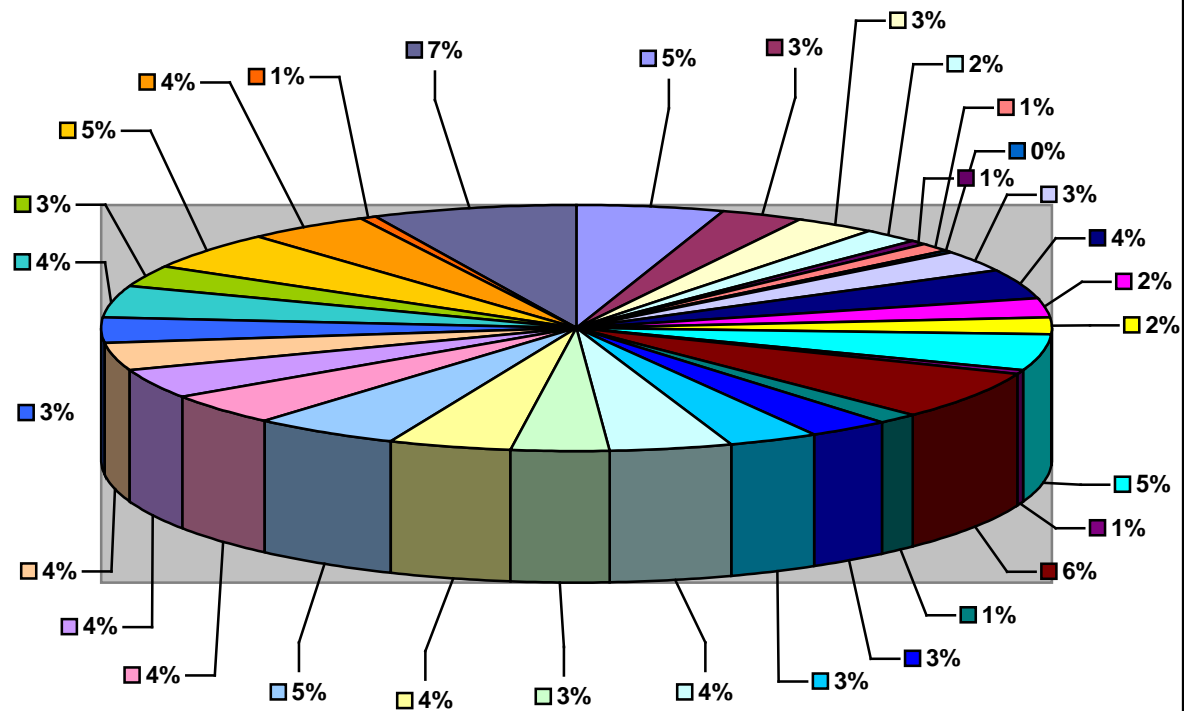
1. There are fertile lands of 65% of Azraq area as it has good soil with rich minerals.
2. Azraq people and the farmers have planted olive trees in 37% of the fertile land because the olive tree relatively needs little watering and yield seasonal fruits
3. Palm trees are commonly planted in 15% of the land. These trees are in the proper climate, as they survive with little water, the soil is good for such trees and they do not need many workers.
4. There are vine farms in 60% of the fertile land. But vine plantation need much water, many workers and pesticides.
5. There are other fruit trees in 38%, such as pomegranate, guava, etc.
6. There are many expatriate workers in Jordan, 85% of which are agrarian workers. The expatriate workers get cheaper wages and thus affect the income Jordanian workers who form 15% of the agrarian workers.
7. Livestock forms 37% of the total livestock. Since Azraq inhabitants live on domestic livestock, there are several kettle farms and a dairy factory run by an NGO.

It is worth mentioning that the ratio of farmers from Azraq inhabitants is only 9%. The outsider farmers are 91%. The number of farms is 608.

Herewith Table 4, please find the analysis of a sample of 175 farms.

Areas good for farming in Azraq	65%
Number of olive trees	37%
Fruit trees	38%
Foster trees	25%
Pomegranate	8%
Palm trees	15%
Field crops	3%
Livestock (cows, sheep and horses)	37% (50%, 32%, 31%)
Vine trees	60%
Fisheries	10%
Expatriate farm workers	85%
Jordanian farm workers	15%
Number of families living in the farms	39%
Soil quality	40% good, 55% satisfactory
Water quality	45% good, 55% satisfactory
Unlicensed water wells	63%
Licensed water wells	55%

Water pumped for irrigation	52%
Water used for drinking	48%
Use of modern irrigation methods	45%
Use of surface canals irrigation	55%
Role of agrarian guidance	34% good, 66% need activation
Knowledge of Agrarian dates	55%
Farmers from among Azraq people (12 farms)	9%
Farmers from outside Azraq (608 farms)	91%



- areas good for farming in Azraq
- number of olive trees
- fruit trees
- foster trees
- pomegranate
- palm trees
- field crops
- livestock
- cows
- sheep
- horses
- vine trees
- fisheries
- expatriate farm workers
- jordanian farm workers
- number of families living in the farms
- soil quality
- soil quality
- water quality
- water quality
- unlicensed water wells
- licensed water wells
- water pumped for irrigation
- water pumped for irrigation
- water used for drinking
- use of modern irrigation methods
- use surface canals irrigation
- role of agrarian guidance

This analysis and sample indicators show the obstacles hindering agriculture in Jordan. The obstacles are as follows:

1. High ration of saline in water and soil, which is reflected in poor quantity and quality of products. Saline is caused by over pumping from water wells and absence of modern methods of irrigation.
2. Azraq is far away from central markets, which tire the farmer to find local market places and make him pay more for workers and transportation.
3. High prices of water increases burden on farmers and lead them to dig illegal wells to avoid irrigation from licensed wells that have meters for payment.
4. Shortage in agrarian guidance, which negatively affects the production cost and lead to plantation of types that do not suit the area. This adds a burden of more cost, not using irrigation method, using excessive pesticides, and spraying insecticides, which increase the cost and affect the environmental conditions in the area.
5. Increase of production inputs like fuel because of the absence of electricity. This increases production cost is added to payment for workers and payment for plastic and fertilizers.
6. There are only few agrarian paved roads and services, which increase cost and yield bad quality.
7. Licensing the land, which is stopped because of “clan interfacing”, could help people to go back to farming.
8. The inactivation of laws in water for irrigation is leading to more digging of water wells, unlicensed wells and not collecting water prices from influential people. The scattered expansion in land cultivation has led to overuse of the water basin and decrease of level and quality of the underground water.