GIS as a tool for rural livelihoods enhancement planning

(Case study of Alosylat region -Shareg Alnil-Sudan)

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Presentation Agenda

- INTRODUCTION
- RESEARCH OBJECTIVE
- LITERATURE REVIEW
- RESEARCH QUESTIONS
- DATABASE AND METHODOLOGY
- RESULTS AND DISCUSSION
- FUTURE OF THE STUDY

INTRODUCTION

- We became the information society and entered the age of knowledge.
- The socio-economic impact of information is huge and sustainable development is unthinkable outside of a knowledge-based society.
- Livelihoods development planning project, intervention must be based on the current reality of the community with respect to income, expenditure, employment, risk capitals and the contexts related of the household, community and surrounding area.
- The best approach to a deeper understanding of the available resources and assets of the community is to include the knowledge of the local people to assess, analyze and plan.
- This process leads to Livelihoods Enhancement Action Plan (LEAP).
- The Livelihoods Enhancement Action Plan (sometimes called the LEAP tool) uses social, resources, and livelihoods maps, trade in and trade out analysis, income, expenditure, risk, gender, and local market analyses.
- Here we can observed clearly the role of geographical information to produce evidence that there is high demand for the GIS research as a management and monitoring tool in the livelihoods development planning.
- The participatory GIS (p GIS) integrated with LEAP tools will enhance the rural livelihoods' planning.

RESEARCH OBJECTIVE

- The basic objective of the research outcome is enhancing the planning of rural livelihoods by using P GIS as a geographic database, planning and monitoring tool (Case study of Alosylat region- Shareg Alnil- Sudan).
- **The specific objectives of the research outputs are to:**
- Generate information about the rural livelihoods situation based on current reality from local knowledge (participatory manner) using the LEAP tool to acquire non-spatial primary data
- Integrate non-spatial primary data with spatial secondary data to acquire spatial rural livelihoods information using P GIS.

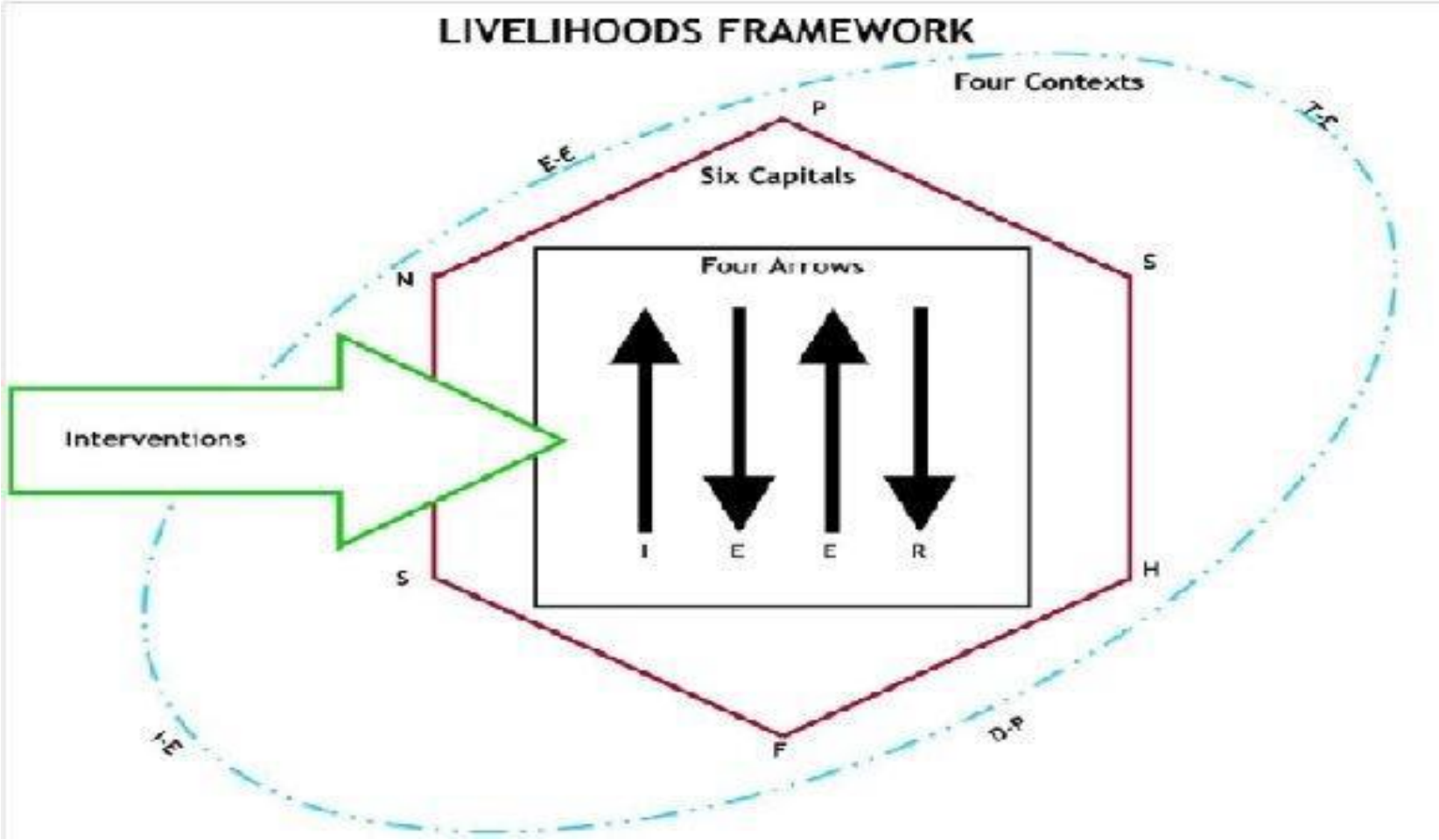
LITERATURE REVIEW *Scoones (1998)*

- At the Institute for Development Studies (IDS), *Scoones (1998)* showed a sustainable livelihoods approach in his working paper. He outlined a well – acclaimed framework for analyzing sustainable livelihoods that he termed "livelihoods framework".
- The paper illustrated how, in different contexts and institutional process, sustainable livelihoods are achieved by having access to capital assets and resources ,which are combine in certain types of livelihood strategies .
- This framework draw heavily from the concepts of participation and participatory manner to empowers understanding of the complexity in a livelihood(s), identifies all the supports required by a household or community, and the need for preparation and support from households and the community .
- The framework provides answers to the following questions:

LITERATURE REVIEW *Scoones (1998)*

- What are the objectives of livelihoods intervention?
- What capital does a household use to engage in activities that accomplish their livelihoods objectives?
- How does the context affect the livelihoods of a household?
- How are activities, objectives, capital and context related to each other?
- The livelihoods framework makes it easier for us to focus on understanding one influencing factor element at a time and bringing them together to get the broader picture by providing answers to those questions.

LITERATURE REVIEW *Scoones (1998)*



SUSTAINABLE RURAL LIVELIHOODS

A FRAMEWORK FOR ANALYSIS

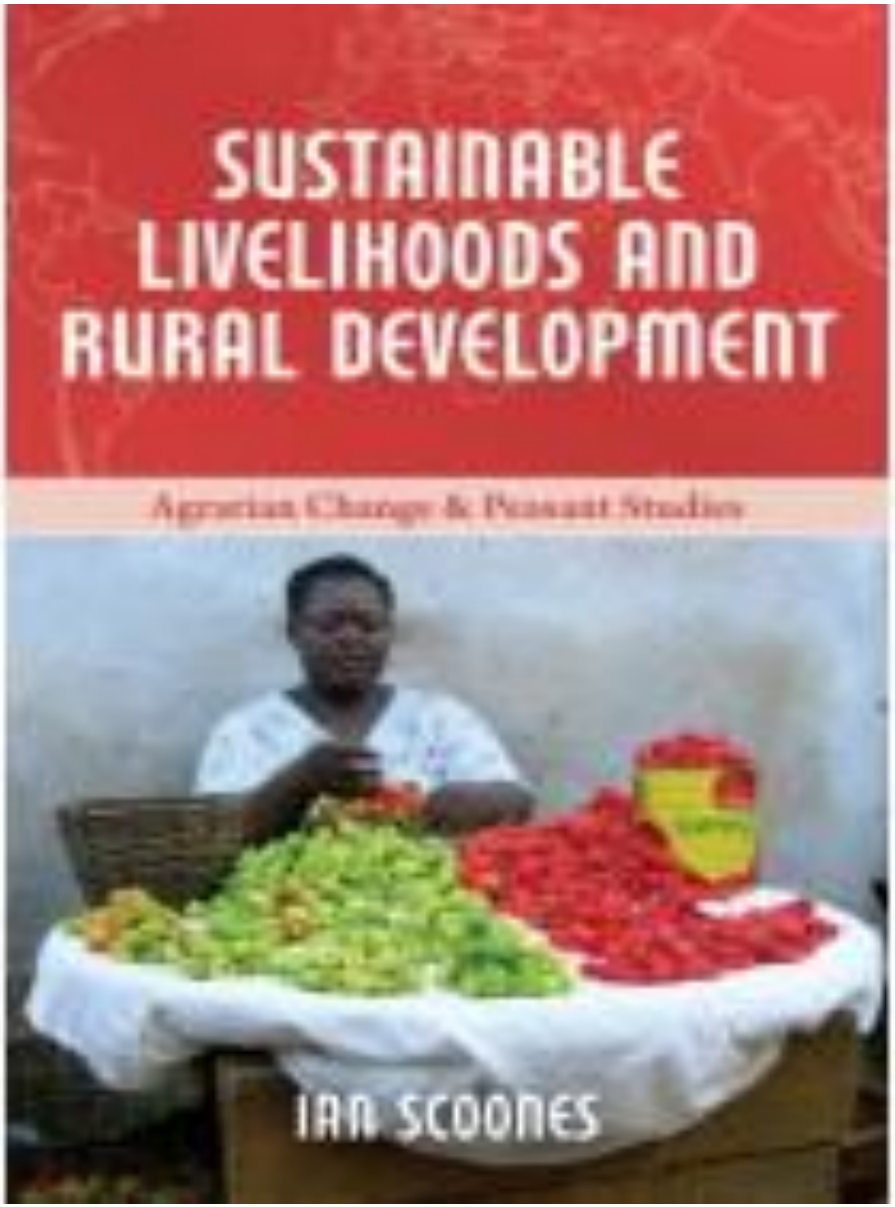
IDS WORKING PAPER 72

Ian Scoones

SUMMARY

The concept of 'sustainable livelihoods' is increasingly important in the development debate. This paper outlines a framework for analysing sustainable livelihoods, defined here in relation to five key indicators. The framework shows how, in different contexts, sustainable livelihoods are achieved through access to a range of livelihood resources (natural, economic, human and social capitals) which are combined in the pursuit of different livelihood strategies (agricultural intensification or extensification, livelihood diversification and migration). Central to the framework is the analysis of the range of formal and informal organisational and institutional factors that influence sustainable livelihood outcomes. In conclusion, the paper briefly considers some of the practical, methodological and operational implications of a sustainable livelihoods approach.

Scoones, I 1998. Sustainable rural livelihoods: a framework for analysis. *IDS Working Paper* 72. Brighton



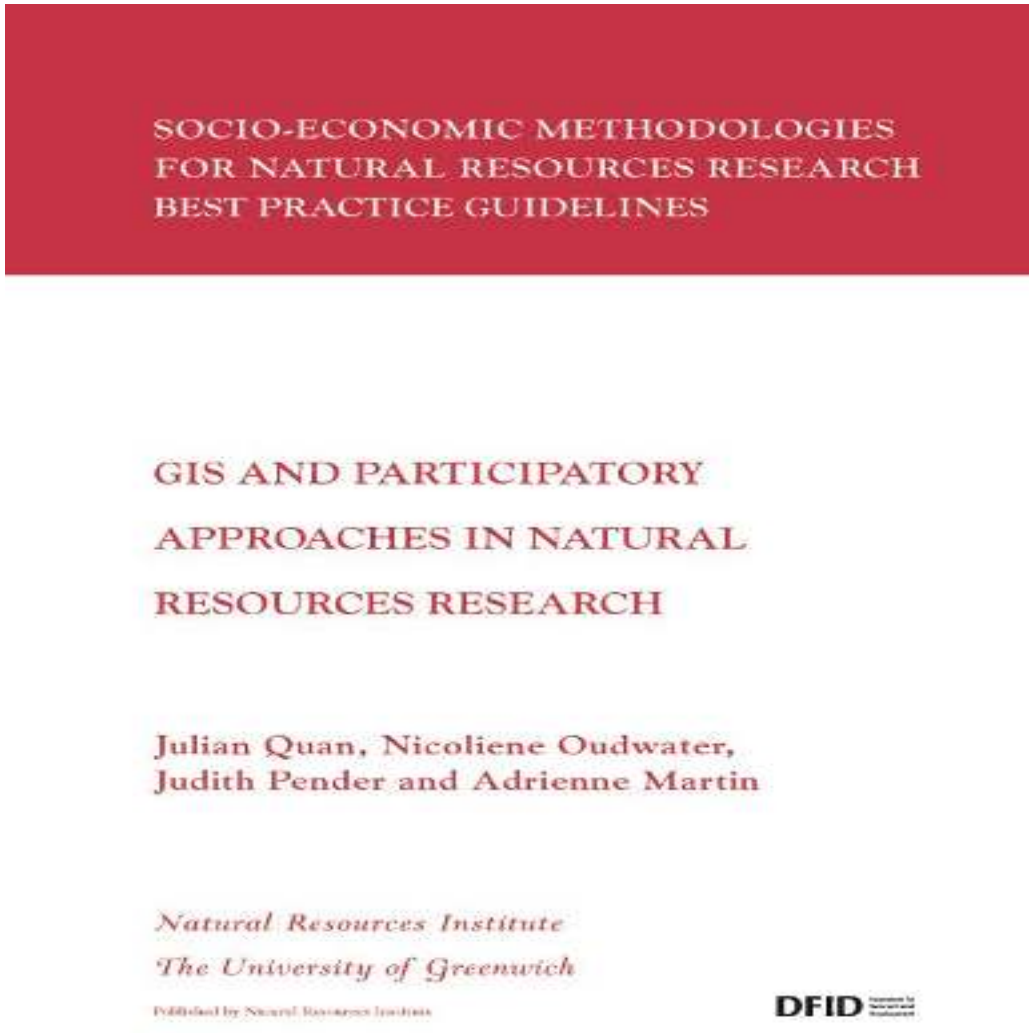
Scoones, I 2015. *Sustainable rural livelihoods and rural development*

LITERATURE REVIEW *Quan et al (2001)*

- *Quan et al (2001)* The potential of PGIS,its usefulness can be high if it is applied to sustainable livelihoods development and poverty reduction in participatory approach.
- The spatial information and visuals, which the GIS provide, can assist planners to reach goals ,by doing the following:
- I. Visualizing and mapping of capital assets .
- II. Providing an understanding of the impact that vulnerability factors, socio-historical processes, realization of policies set and service delivery institutions have on different areas.
- III. Using the GIS as a monitoring tool in sustainable livelihoods and poverty reduction by including indicators like “incomes, access to land,,access to basic services, animal and human health, employment, market development and trade flows.

LITERATURE REVIEW *Quan et al (2001)*

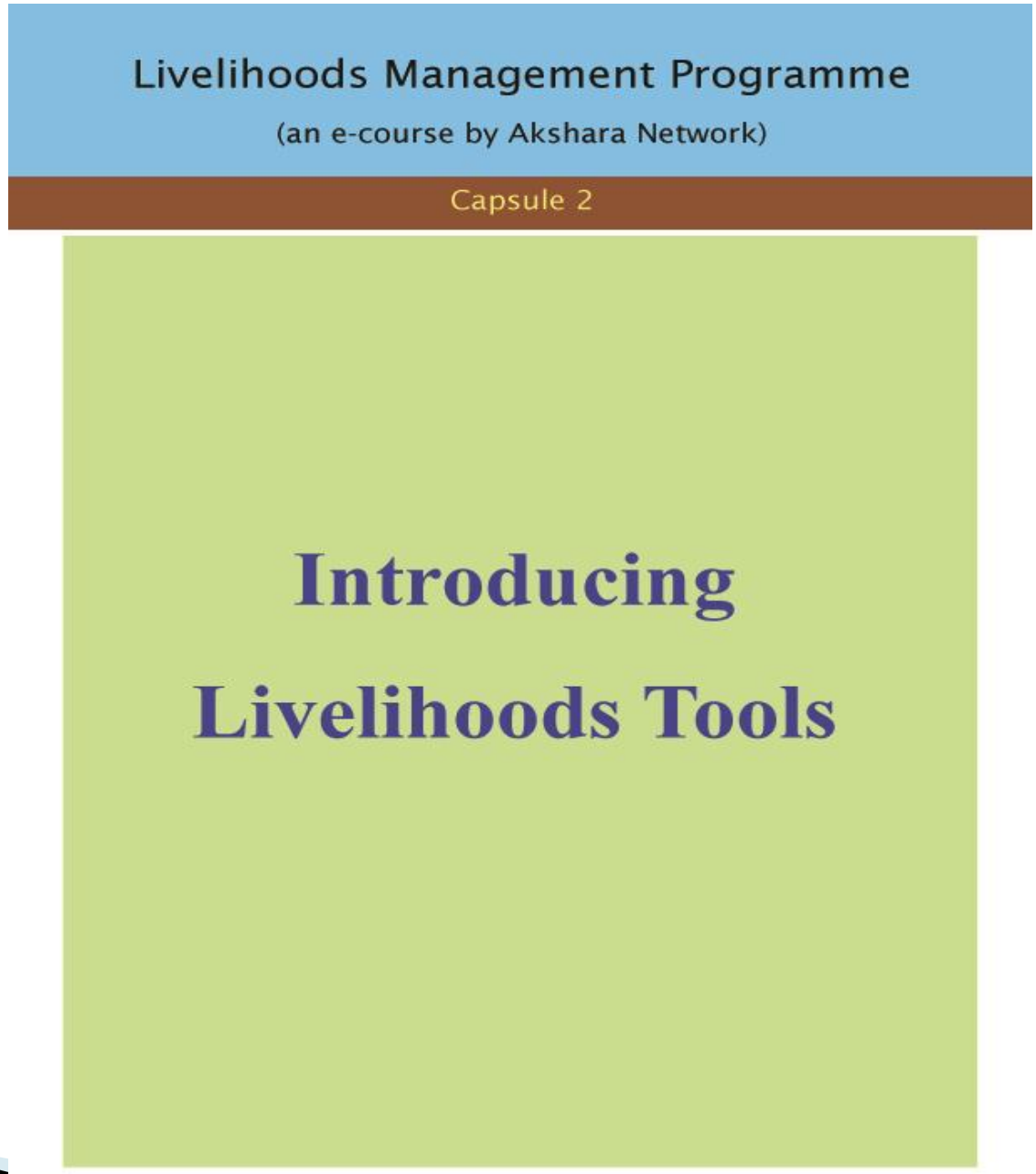
- *Quan et al (2001:24)* have written, effective application of GIS to target areas, or even whole countries or regions, can help in monitoring and visualizing change and, thereby, measuring progress.
- GIS undoubtedly provides a powerful tool for agencies committed to making a difference for the poor, and to strengthening dialogue in planning and environmental management.



Quan , J , Oudwate , N , Pender , J and Martin ,A 2001. GIS And Participatory Approaches In Natural Resources Research. In Quan , J , Oudwate , N , Pender , J and Martin ,A (ed), *GIS And Participatory Approaches In Natural Resources Research. Socio-Economic Methodologies For Natural Resources Research. Best Practice*

LITERATURE REVIEW Akshara Network 2012.

- Adequate livelihoods intervention progressed from an understanding of the livelihoods situation. Participatory assessment of the household, the community, the village and surrounding areas combined with relevant outside information presented to the community provides an understanding of the livelihoods situation. The community analyses the information and creates interventions and an action plan. These step by step of processes leads to the Livelihoods Enhancement Action Plan (LEAP).
- The competent use LEAP stems from understanding and analyzing the current realities of livelihoods, identifying and filling the gaps in knowledge and seizing the opportunity to plan.
- It's require familiar and support from villager therefore it need time to spend in the village



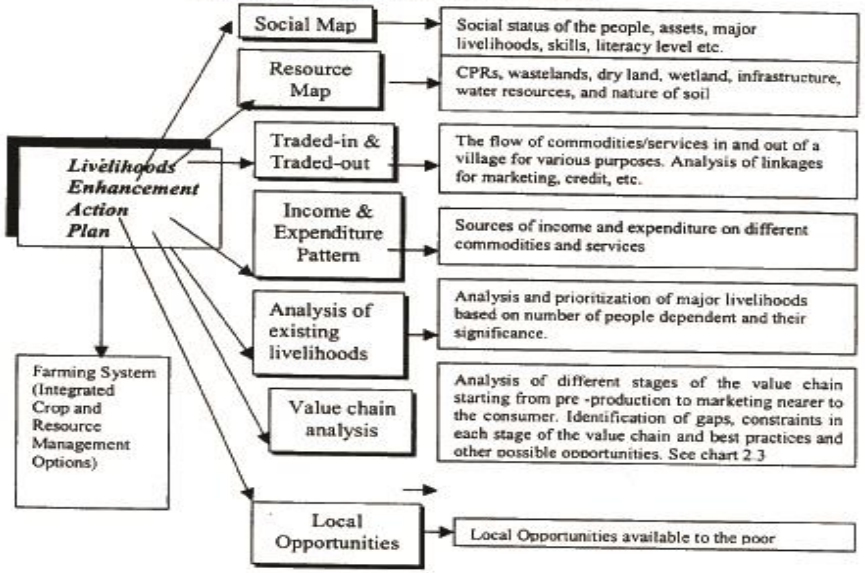
Akshara Network 2012. *How to do LEAP*

Andhra Pradesh - KPRP (2002)

Annexure – 1

LEAP PROCESS

Important Segments of the LEAP Processes



A1.1 Analysis of Social Map

Social map provides the following information: total population (women and men ratio), total number of families, the social composition (caste groups) of a village, housing pattern of various castes, types of houses, number of different livestock, migrated population, number of single women and old age pension holders in a village. It also provides information about the formal and informal institutions such as school, primary health centre, veterinary hospital, panchayati office, DWACRA groups, watershed societies, caste-based organisations, Vana Samarakshyana Samities (forest protection committees), water users associations etc.

CIFSP ideas: Social mapping should be done with an eye to facilitate the community to come up with some CIFSP ideas, such as imparting skills to migrant labour, promotion of dairy and livestock, infrastructure development, measures to provide security to single and old-aged women, etc.

A1.2 Analysis of Resource Map

Resource map provides the following information:

- Total land in the village

World bank 2002. *Important Segments of the LEAP Processes*

LITERATURE REVIEW *(Ali ,2009)*

- The use of GIS technology has evolved. However, due to lack of public awareness, geospatial data, funds, trained people, and data sharing, Sudan has been slow to adopt this technology *(Ali ,2009).*

UNITED NATIONS E/CONF.100/CRP.10

ECONOMIC AND SOCIAL COUNCIL

Eighteenth United Nations Regional Cartographic Conference for Asia and the Pacific
Bangkok, 26-29 October 2009
Item 7(a) of the provisional agenda
Country Reports

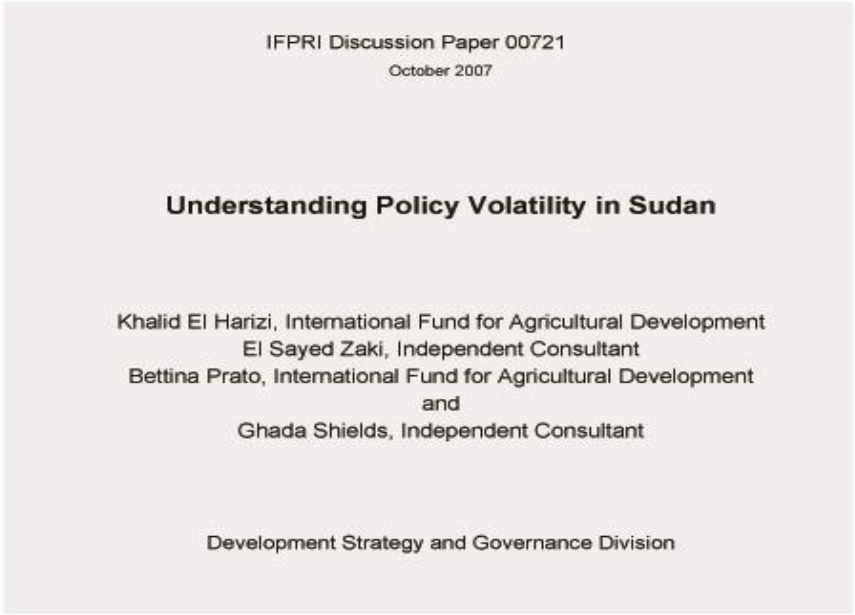
Current Status of GIS in the Sudan*

* Prepared by Abdullah Elsadig Ali, Director General, Sudan National Survey Authority, Khartoum

Ali , A 2009.Current Status of GIS in the Sudan

LITERATURE REVIEW *El Harizi et al(2007)*

- The lack of community and stakeholder participation in decision making and limited accountability of institutions of government are phenomena in Sudan. They are factors that cause policy failure.
- *El Harizi et al (2007)* found in their discussion Paper about Understanding Policy Volatility in Sudan, that the lack of participation in decision making result in poor generation of information and less interest of stakeholder which is often lead to policy failure.



IFPRI Discussion Paper 00721

October 2007

Understanding Policy Volatility in Sudan

Khalid El Harizi, International Fund for Agricultural Development
El Sayed Zaki, Independent Consultant
Bettina Prato, International Fund for Agricultural Development
and
Ghada Shields, Independent Consultant

Development Strategy and Governance Division

El Harizi , K , Zaki, E, Prato, B ,Shields , G 2007.*IFPRI Discussion Paper 00721*. Understanding Policy Volatility in Sudan

RESEARCH PROBLEMS

- Lack of the participation of community and stockholders in decision making results in the inadequate acquisition of information, which is the reason for the failure of most polices in Sudan, including livelihood development planning.
- Lack of geospatial data in Sudan is one of the problems that prevents a full implementation of GIS in economic development planning and consumption of natural resources.

- Most rural development planning in Sudan is prepared in urban centers outside the affected villages and imposed upon those communities without knowledge of village realities. *

** Interview with the Executive Officer, Mohamed O.M.Ahmed (Sudan National council for strategic planning), 14.August. 2016.*

RESEARCH QUESTIONS

- What is the livelihoods situation for the villages in the study area given the social, livelihoods, resource maps, traded-in traded-out, income and expenditures patterns, genders, local markets, the emerging opportunity in wider markets, institutional analyses, and others as seen by GIS?

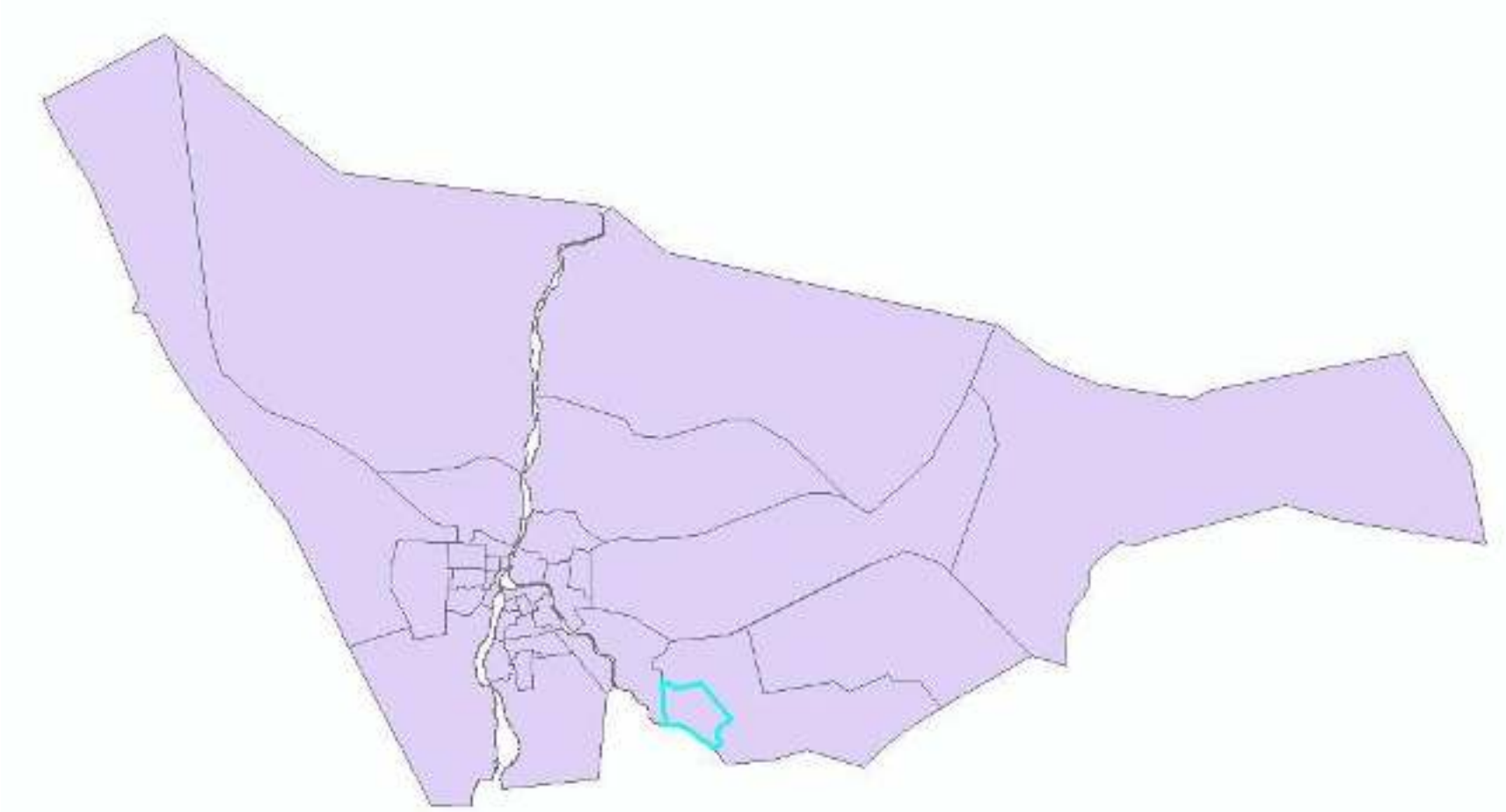
RESEARCH QUESTIONS

- How can the GIS transform local knowledge from a study area into better polices for livelihoods enhancement planning at the regional and national levels?
- Given a participatory approach, how do we integrate data about the livelihoods, the social, the extent of poverty, and the availability of resources with geographical data?
- How do we build the livelihoods plan and map the plan onto the GIS?
- How do we see progress using GIS

DATABASE AND METHODOLOGY

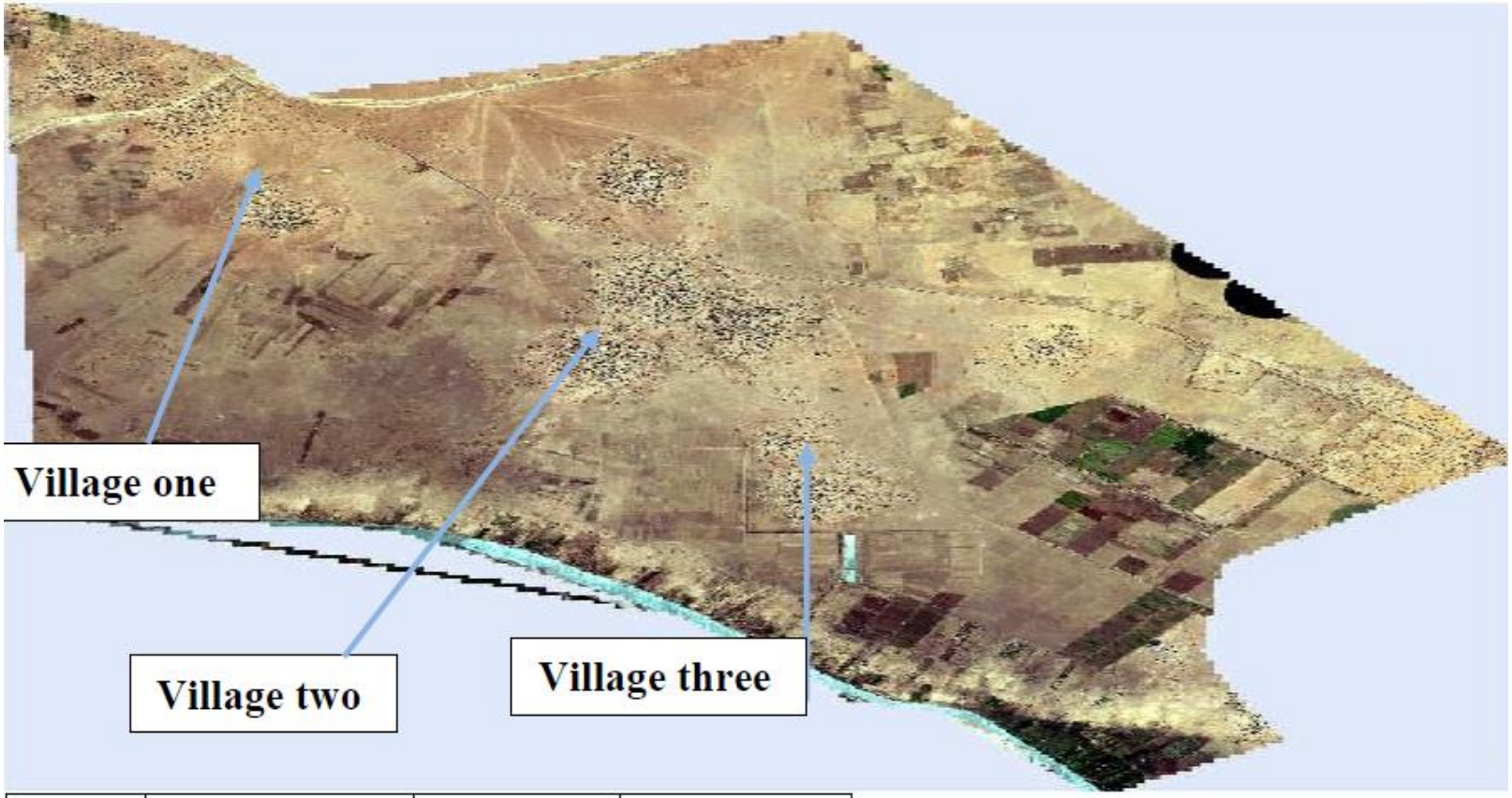
- **The Study area**
- The case study of the research has been carried out in the three villages of Alosylat region, Alhoyla village, Algwaz village, and Alhsnab village of Shareg Alnil locality in Khartoum state of Sudan

DATABASE AND METHODOLOGY



Map of Khartoum state (Source. Sudan Ministry of Federal Health 2004)

DATABASE AND METHODOLOGY



West	32.804784	**East**	32.939667
North	15.430915	**South**	15.298017

Map of Alosylat region (Source Nokia Ovi Maps 2016)

DATABASE AND METHODOLOGY

1. THE TWO STEP DATA COLLECTION PROCESS

- A. Primary data

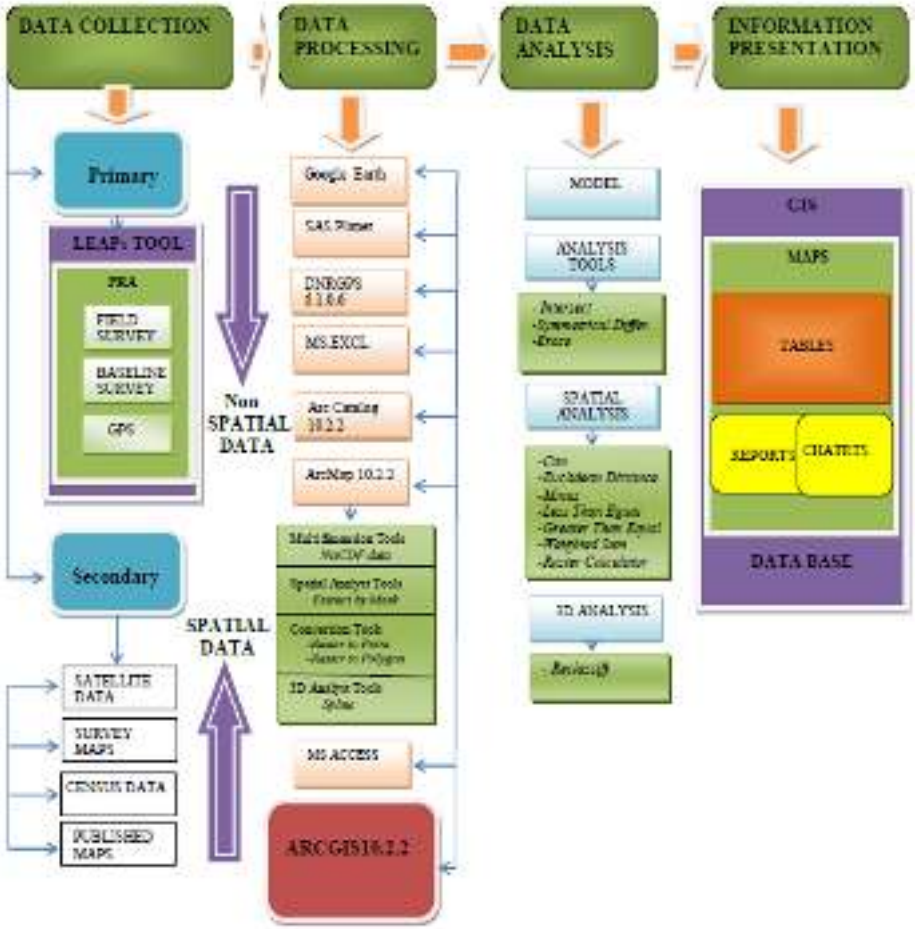
- The collection of the primary data (non-special data) have been completed by using the LEAP tool which is use the Participatory Rural Approach or PRA
- These participatory tools include group discussion, semi-structured interviews and transect walks to collect data, observing, asking, listening, looking and identifying zones.
- By walking the field, spatial data such as land use, settlement pattern and people's perception of these investigated and discussed in detail.
- The villager used markers to draw on large sheets of paper colored markers used to identify different aspects of the map. If villagers were unfamiliar with the use of writing instruments, they can draw "maps" on the ground with a stick.
- The Global Positioning System (GPS) applied data derived from the PRA stage for validation and accuracy of information gathered in regards to locating service centers, housing units, digitizing road networks, and obtaining precision points for geocoding satellite images .
- B. Secondary data

- Satellite data generated by Google Earth, free datasets portals and DG sat free satellites will be used to collect secondary data (special data), in addition to the survey maps, census data published by the Sudan National Survey Authority, Khartoum Federal Ministry of Health and Statistics Authority .

DATABASE AND METHODOLOGY

- **2. DATA PROCESSING**
- After collecting primary and secondary data, some computer used to process the data. The spatial knowledge of the people presented in the form of layer maps and supplemented by Geo-spatial or map based information management tools, ranging from sketch maps, aerial photographs, satellite imagery, the Global Positioning System (GPS).
- The data processing software programs are Google Earth, Microsoft Excel, Microsoft Access, ArcMAP 10.2.2, ARC Catalog 10.2.2, and SASPlanet

- **3. DATA ANALYSIS**
- After data was processed and stored in ArcGIS 10.2.2 as spatial data, the ArcGIS 10.2.2 analysis tool used for data analysis .
- **4. INFORMATION PRESENTATION**
- ArcGIS 10.2.2 presented the spatial knowledge of the people in the form of layers maps .


DATA COLLECTION
DATA PROCESSING
DATA ANALYSIS
INFORMATION PRESENTATION
Primary
LEAP: TOOL
PRA
FIELD SURVEY
BASELINE SURVEY
GPS
Secondary
SATELLITE DATA
SURVEY MAPS
CENSUS DATA
PUBLISHED MAPS
Non SPATIAL DATA
SPATIAL DATA
Google Earth
SAS Planet
DNRGPS 3.1.0.6
MS EXCEL
Arc Catalog 10.2.2
ArcMap 10.2.2
MS ACCESS
ARC GIS10.2.2
MODEL
ANALYSIS TOOLS
SPATIAL ANALYSIS
3D ANALYSIS
GIS
MAPS
TABLES
REPORTS
CHARTS
DATA BASE

Results and Discussion

- **Social Map**
- The social map enables the user to gain understanding about social status for the three villages.
- By using GIS which integrated all the social information's for the three villages and stored it to one geodatabase system and layers as show in attribute table below and map.
- This will help planning and decision making users who use the system to quarrying, analysing, and visualizing object on geo-referencing(GPS) map, for the three villages together in purpose to understanding of the situation before plan or manage activities

Table

Social_map

OBJECTID *	SHAPE *	Objectds	Other information if any	Number	Village Name	Region name
5	Multipoint	Families	No	5	Alhoyla	Alosylat
6	Multipoint	Families	No	4	Alhoyla	Alosylat
7	Multipoint	Families	No	6	Alhoyla	Alosylat
8	Multipoint	Families	No	8	Alhoyla	Alosylat
9	Multipoint	Families	No	9	Alhoyla	Alosylat
10	Multipoint	Families	No	3	Alhoyla	Alosylat
11	Multipoint	Families	No	6	Alhoyla	Alosylat
12	Multipoint	Families	No	8	Alhoyla	Alosylat
13	Multipoint	Families	No	9	Alhoyla	Alosylat
14	Multipoint	Families	No	3	Alhoyla	Alosylat
15	Multipoint	Families	No	3	Alhoyla	Alosylat
16	Multipoint	Families	No	4	Alhoyla	Alosylat
17	Multipoint	Families	No	12	Alhoyla	Alosylat
18	Multipoint	Families	No	6	Alhoyla	Alosylat
19	Multipoint	Families	No	4	Alhoyla	Alosylat
20	Multipoint	Families	No	6	Alhoyla	Alosylat
21	Multipoint	Families	No	7	Alhoyla	Alosylat
22	Multipoint	Families	No	6	Alhoyla	Alosylat
23	Multipoint	Families	No	6	Alhoyla	Alosylat
24	Multipoint	Families	No	5	Alhoyla	Alosylat
25	Multipoint	Families	No	6	Alhoyla	Alosylat
26	Multipoint	Families	No	5	Alhoyla	Alosylat
28	Multipoint	Families	No	8	Algwaz	Alosylat
29	Multipoint	Families	No	14	Algwaz	Alosylat
30	Multipoint	Families	No	5	Algwaz	Alosylat
31	Multipoint	Families	No	4	Algwaz	Alosylat
32	Multipoint	Families	No	3	Algwaz	Alosylat
33	Multipoint	Families	No	7	Algwaz	Alosylat
34	Multipoint	Families	No	7	Algwaz	Alosylat
36	Multipoint	Families	No	8	Alhsnab	Alosylat
37	Multipoint	Families	No	4	Alhsnab	Alosylat
38	Multipoint	Families	No	5	Alhsnab	Alosylat
39	Multipoint	Families	No	3	Alhsnab	Alosylat
40	Multipoint	Families	No	2	Alhsnab	Alosylat
41	Multipoint	Families	No	10	Alhsnab	Alosylat
42	Multipoint	Families	No	2	Alhsnab	Alosylat
43	Multipoint	Families	No	11	Alhsnab	Alosylat
48	Multipoint	Below Poverty Line (BPL)	No	3	Alhoyla	Alosylat

1 (0 out of 146 Selected)

Table

Social_map

OBJECTID *	SHAPE *	Objectds	Other information if any	Number	Village Name	Region name
49	Multipoint	Below Poverty Line (BPL)	No	2	Alhoyla	Alosylat
50	Multipoint	Below Poverty Line (BPL)	No	3	Alhoyla	Alosylat
51	Multipoint	Below Poverty Line (BPL)	No	2	Algwaz	Alosylat
52	Multipoint	Below Poverty Line (BPL)	No	2	Algwaz	Alosylat
53	Multipoint	Below Poverty Line (BPL)	No	1	Algwaz	Alosylat
54	Multipoint	Below Poverty Line (BPL)	No	2	Algwaz	Alosylat
55	Multipoint	Below Poverty Line (BPL)	No	2	Alhsnab	Alosylat
56	Multipoint	Below Poverty Line (BPL)	No	1	Alhsnab	Alosylat
57	Multipoint	Below Poverty Line (BPL)	No	4	Alhsnab	Alosylat
58	Multipoint	Bus Facility	No	1	Alhoyla	Alosylat
59	Multipoint	Bus Facility	No	1	Algwaz	Alosylat
60	Multipoint	Bus Facility	No	1	Alhsnab	Alosylat
62	Multipoint	Bus shelter	No	1	Alhoyla	Alosylat
63	Multipoint	Bus shelter	No	1	Algwaz	Alosylat
64	Multipoint	Bus shelter	No	1	Alhsnab	Alosylat
66	Multipoint	Cable connection	No	4	Alhoyla	Alosylat
67	Multipoint	Cable connection	No	5	Algwaz	Alosylat
68	Multipoint	Cable connection	No	4	Alhsnab	Alosylat
69	Multipoint	Cement Roads	No	1	Algwaz	Alosylat
70	Multipoint	Cement Roads	No	0	Alhoyla	Alosylat
71	Multipoint	Cement Roads	No	0	Alhsnab	Alosylat
72	Multipoint	Child Labor	No	3	Algwaz	Alosylat
73	Multipoint	Child Labor	No	2	Alhsnab	Alosylat
74	Multipoint	Child Labor	No	4	Alhoyla	Alosylat
75	Multipoint	Church	No	0	Alhoyla	Alosylat
76	Multipoint	Church	No	0	Algwaz	Alosylat
77	Multipoint	Church	No	0	Alhsnab	Alosylat
78	Multipoint	Community Halls	No	0	Alhoyla	Alosylat
79	Multipoint	Community Halls	No	0	Algwaz	Alosylat
80	Multipoint	Community Halls	No	0	Alhsnab	Alosylat
81	Multipoint	Cooperatives	No	0	Alhoyla	Alosylat
82	Multipoint	Cooperatives	No	0	Algwaz	Alosylat
83	Multipoint	Cooperatives	No	0	Alhsnab	Alosylat
84	Multipoint	Galose Houses	No	8	Alhoyla	Alosylat
85	Multipoint	Galose Houses	No	3	Algwaz	Alosylat
86	Multipoint	Galose Houses	No	4	Alhsnab	Alosylat
87	Multipoint	Hand Pumps	No	1	Algwaz	Alosylat
88	Multipoint	Hand Pumps	No	0	Alhoyla	Alosylat

1 (0 out of 146 Selected)

Social_map

Catalog | Table

Table

Social_map

OBJECTID *	SHAPE *	Objectds	Other information if any	Number	Village Name	Region name
89	Multipoint	Hand Pumps	No	0	Alhsnab	Alosylat
90	Multipoint	Hospitals	No	1	Alhoyla	Alosylat
91	Multipoint	Hospitals	No	1	Alhsnab	Alosylat
92	Multipoint	Houses with cable connection	No	4	Alhoyla	Alosylat
93	Multipoint	Houses with cable connection	No	4	Algwaz	Alosylat
94	Multipoint	Houses with cable connection	No	3	Alhsnab	Alosylat
95	Multipoint	Huts	No	3	Alhsnab	Alosylat
96	Multipoint	Huts	No	4	Algwaz	Alosylat
97	Multipoint	Huts	No	2	Alhoyla	Alosylat
98	Multipoint	Masjid	No	1	Alhoyla	Alosylat
99	Multipoint	Masjid	No	1	Algwaz	Alosylat
100	Multipoint	Masjid	No	1	Alhsnab	Alosylat
101	Multipoint	Migration	No	3	Alhoyla	Alosylat
102	Multipoint	Migration	No	3	Algwaz	Alosylat
103	Multipoint	Migration	No	5	Alhsnab	Alosylat
106	Multipoint	Office	No	3	No Village	Alosylat
107	Multipoint	Old age	No	4	Alhoyla	Alosylat
108	Multipoint	Old age	No	4	Algwaz	Alosylat
109	Multipoint	Old age	No	3	Alhsnab	Alosylat
110	Multipoint	Orphans	No	3	Alhoyla	Alosylat
111	Multipoint	Orphans	No	4	Algwaz	Alosylat
112	Multipoint	Orphans	No	3	Alhsnab	Alosylat
113	Multipoint	Physically Challenged Persons	No	2	Alhoyla	Alosylat
114	Multipoint	Physically Challenged Persons	No	1	Algwaz	Alosylat
115	Multipoint	Physically Challenged Persons	No	2	Alhsnab	Alosylat
116	Multipoint	POOR	No	5	Alhoyla	Alosylat
117	Multipoint	POOR	No	3	Algwaz	Alosylat
118	Multipoint	POOR	No	3	Alhsnab	Alosylat
119	Multipoint	Poorest Of the Poor (POP)	No	1	Alhoyla	Alosylat
120	Multipoint	Poorest Of the Poor (POP)	No	1	Algwaz	Alosylat
121	Multipoint	Poorest Of the Poor (POP)	No	1	Alhsnab	Alosylat
122	Multipoint	Post Office	No	1	No Village	Alosylat
123	Multipoint	Private Taps	No	0	Alhoyla	Alosylat
124	Multipoint	Private Taps	No	9	Algwaz	Alosylat
125	Multipoint	Private Taps	No	0	Alhsnab	Alosylat
129	Multipoint	Private Toilets	No	15	Algwaz	Alosylat
130	Multipoint	Public Distribution system (PDS)	No	1	Alhoyla	Alosylat
131	Multipoint	Public Distribution system (PDS)	No	1	Algwaz	Alosylat
132	Multipoint	Public Distribution system (PDS)	No	1	Alhsnab	Alosylat

	134	Multipoint	Public Taps	No	1	Alhsnab	Alosylat
	135	Multipoint	Public Taps	No	1	Algwaz	Alosylat
	136	Multipoint	Public Taps	No	1	Alhoyla	Alosylat
	137	Multipoint	Public Toilets	No	3	No Village	Alosylat
	138	Multipoint	School Building	No	1	Alhoyla	Alosylat
	139	Multipoint	School Building	No	1	Algwaz	Alosylat
	140	Multipoint	School Building	No	1	Alhsnab	Alosylat
	142	Multipoint	Single Women	No	5	Alhsnab	Alosylat
	143	Multipoint	Single Women	No	6	Algwaz	Alosylat
	145	Multipoint	Single Women	No	7	Alhoyla	Alosylat
	146	Multipoint	Subscriber Trunk Dialing (STDs)	No	0	Alhoyla	Alosylat
	147	Multipoint	Subscriber Trunk Dialing (STDs)	No	0	Algwaz	Alosylat
	148	Multipoint	Subscriber Trunk Dialing (STDs)	No	0	Alhsnab	Alosylat
	149	Multipoint	Telephone Facility	No	0	Alhoyla	Alosylat
	150	Multipoint	Telephone Facility	No	0	Algwaz	Alosylat
	151	Multipoint	Telephone Facility	No	0	Alhsnab	Alosylat
	152	Multipoint	Toab Houses	No	10	Alhoyla	Alosylat
	153	Multipoint	Toab Houses	No	4	Algwaz	Alosylat
	154	Multipoint	Toab Houses	No	5	Alhsnab	Alosylat
	155	Multipoint	Veterinary Clinic	No	1	No Village	Alosylat
	156	Multipoint	Water Tank	No	2	No Village	Alosylat
	157	Multipoint	Wells	No	2	Algwaz	Alosylat
	158	Multipoint	Wells	No	0	Alhoyla	Alosylat
	159	Multipoint	Wells	No	0	Alhsnab	Alosylat
	160	Multipoint	Widows	No	5	Alhoyla	Alosylat
	161	Multipoint	Widows	No	3	Algwaz	Alosylat
	162	Multipoint	Widows	No	2	Alhsnab	Alosylat
	163	Multipoint	Working NGOs	No	3	No Village	Alosylat
	164	Multipoint	Youth Clubs	No	1	Alhoyla	Alosylat
	165	Multipoint	Youth Clubs	No	1	Algwaz	Alosylat
	166	Multipoint	Youth Clubs	No	1	Alhsnab	Alosylat

Social Analysis

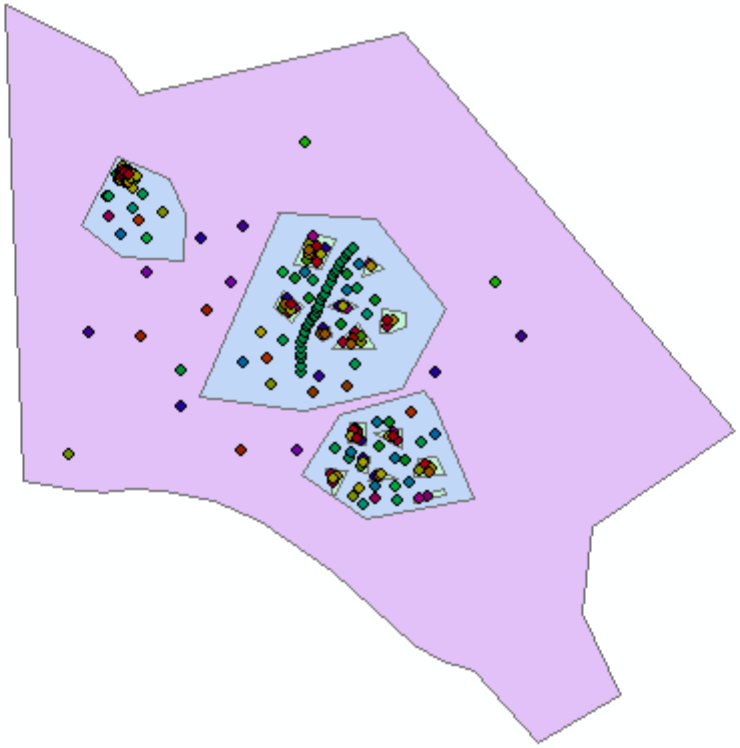
Table

Social_Analysis

OBJECTID *	SHAPE *	Village Name	Population	Male	Female	Children	From 0 to 5 child	From 6 to 10 child	From 11 to 15 child	Literacy Details	Other population information if any
1	Polygon	Alhoyla	400	150	200	50	10	10	30	150	No
2	Polygon	Algwaz	300	120	150	30	7	10	13	120	No
3	Polygon	Alhsnab	250	70	150	80	20	20	40	110	No

SHAPE_Length	SHAPE_Area	Cows & Buffaloes	Bullocks	Calves	Sheep	Goats	Poultry Birds	Camels
6605.458435	2907631.17183	50	20	12	40	45	45	4
14098.890997	12961520.320469	40	10	14	20	50	70	0
9487.677489	5522651.319235	45	15	12	10	25	100	1

Results and Discussion



The Social Map

Results and Discussion

- **Resources Map Analysis**
- The resource map identifies the location of natural resources in the village and their distribution.
- Using GIS, which integrated all the natural resources information's for the three villages and stored it to one geodatabase system and layers as show in the attribute table below and *Map* , will help planning and decision making users who use the system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map for the three villages together to understand the situation of natural resources before plan or manage activities.

Table

Resource_Map

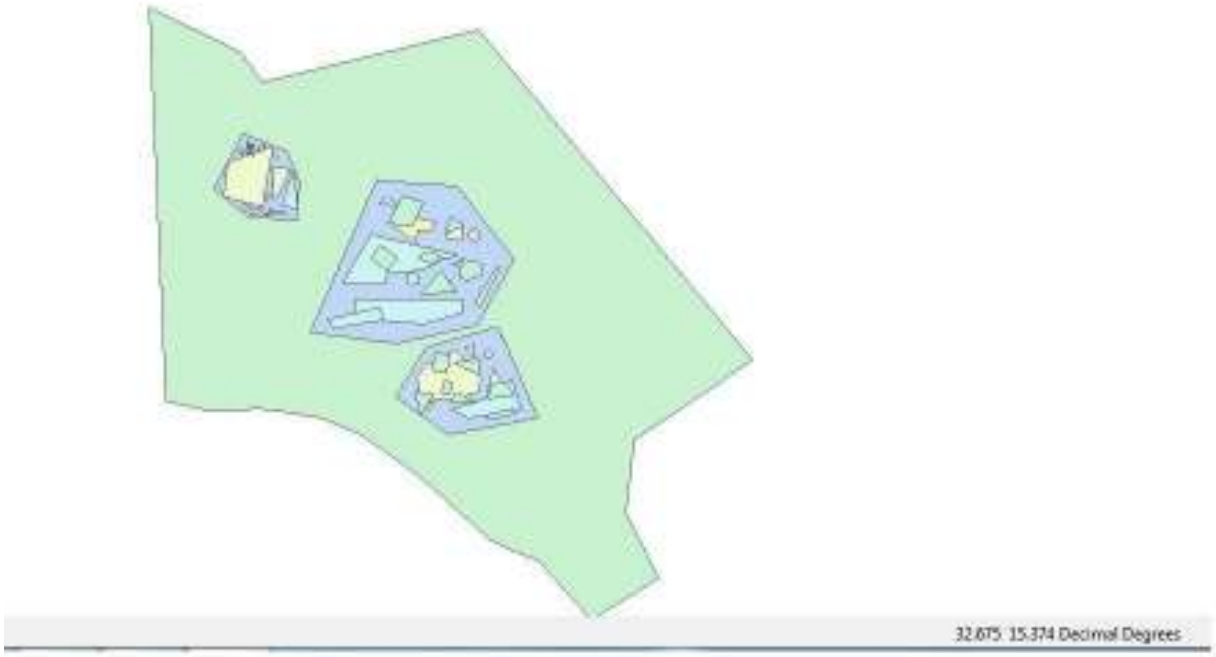
OBJECTID *	SHAPE *	Objectds	SHAPE_Length	Area in Meters squear	Other resource if any	Acres \ Units	Village_name
3	Polygon	Natural Resources	1478.140267	128088.365619	No	0	Alhoyla
4	Polygon	Natural Resources	1313.164104	87679.930646	No	0	Alhoyla
5	Polygon	Black soil	4409.671907	1130089.673162	No	0	Alhoyla
6	Polygon	Bore Wells	124.542765	956.56363	No	0	Alhoyla
7	Polygon	Common propriety resources (CPRs)	406.860147	9312.57454	No	0	Alhoyla
8	Polygon	Common propriety resources (CPRs)	484.963321	12668.131384	No	0	Alhoyla
9	Polygon	Common propriety resources (CPRs)	346.130291	7389.328678	No	0	Alhoyla
10	Polygon	Common propriety resources (CPRs)	557.07986	16909.401921	No	0	Alhoyla
11	Polygon	Dry land	2297.860794	187303.119667	No	0	Alhoyla
12	Polygon	Forest land	2123.664929	201850.04011	No	0	Alhoyla
13	Polygon	Lakes	762.788609	25002.250445	No	0	Alhoyla
14	Polygon	Mosque land	455.214881	12582.109033	No	0	Alhoyla
15	Polygon	Mosque land	384.557797	6433.544903	No	0	Alhoyla
16	Polygon	Open area	1199.698406	45869.484658	No	0	Alhoyla
25	Polygon	Rivers	424.792972	4626.72994	No	0	Algwaz
26	Polygon	Rivers	84.468794	113.292102	No	0	Algwaz
28	Polygon	Mosque land	2874.553457	337112.638295	No	0	Algwaz
29	Polygon	Open Wells	964.015389	36278.919652	No	0	Algwaz
30	Polygon	Sandy soil	6019.327666	1279614.373875	No	0	Algwaz
31	Polygon	Wet land	2284.014014	116305.720525	No	0	Algwaz
32	Polygon	Red soil	6515.767007	1639242.218563	No	0	Algwaz
33	Polygon	Lakes	919.610724	67297.385132	No	0	Algwaz
34	Polygon	Natural Resources	954.445931	45615.030532	No	0	Algwaz
35	Polygon	Natural Resources	613.761763	16633.086019	No	0	Algwaz
36	Polygon	Open area	1055.615657	44858.94635	No	0	Algwaz
37	Polygon	Open area	3057.532286	329223.300392	No	0	Algwaz
38	Polygon	Common propriety resources (CPRs)	1457.742149	129662.538332	No	0	Algwaz
39	Polygon	Red soil	4963.942737	824346.436779	No	0	Alhsnab
40	Polygon	Wet land	3513.935045	610132.343521	No	0	Alhsnab
41	Polygon	Ponds	630.847759	31669.358394	No	0	Alhsnab
42	Polygon	Rocks	824.383831	27469.805519	No	0	Alhsnab
43	Polygon	Open area	847.666129	22555.483369	No	0	Alhsnab
44	Polygon	Mosque land	850.247292	32132.119981	No	0	Alhsnab
45	Polygon	Black soil	4262.819989	1252144.636617	No	0	Alhsnab

1 (0 out of 34 Selected)

Resource_Map

Catalog Table

Results and Discussion



The resource map

Results and Discussion

- **Livelihoods Map Analysis**

- The livelihoods maps enable the community to identify the major vocations and the areas in which these vocations need additional support.
- Using GIS which integrated all the livelihoods information's for the three villages and stored it to one geodatabase system and layers as show in attribute table below and *Map* ,will help planning and decision making users who use the system to quarry, analysing, and visualizing object on geo-referencing(GPS) map for the three villages together, in purpose to understanding the situation of livelihoods before plan or manage activities.

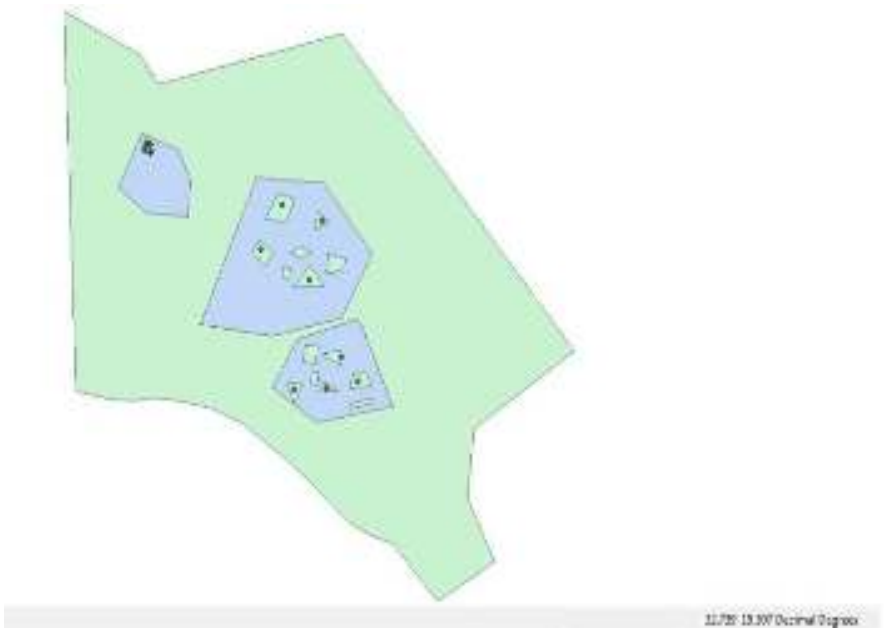
Table

Livelihoods_analysis

OBJECTID *	SHAPE *	Primary Livelihood	Season of Primary Livelihood	Secondary Livelihood	Season of Secondary Livelihood	Thirdly Livelihood	Season of thirdly livelhood
4	Multipoint	Co.Worker	All seasons	NO	NO	NO	NO
5	Multipoint	Officer	All seasons	Middle man	All seasons	NO	NO
6	Multipoint	Veg.Saler	All seasons	Land worker	Kharef	NO	NO
7	Multipoint	store worker	All seasons	Middle man	Winter	Home rent	All seasons
8	Multipoint	Enginner	All seasons	Private work	Winter	NO	NO
9	Multipoint	Bulder	All seasons	NO	NO	NO	NO
10	Multipoint	Machical	All seasons	NO	NO	NO	NO
11	Multipoint	Carbenter	All seasons	NO	NO	NO	NO
12	Multipoint	Raksha Driver	All seasons	Middle man	Summer	NO	NO
13	Multipoint	Singer	All seasons	NO	NO	NO	NO
14	Multipoint	Amjad Driver	All seasons	NO	NO	NO	NO
15	Multipoint	Haise Driver	All seasons	NO	NO	NO	NO
16	Multipoint	Famer	All seasons	land worker	Kharef	NO	NO

Dependent Families	Days of work per month	Income in SDG	Name of the engaged Persons	Gender	Village name	Kind of support required
4	25	2000	Taher	Male	Alhoyla	Health ensurance
5	20	1500	Mohamed	Male	Alhoyla	Home
6	15	800	Alsadig	Male	Alhoyla	capital
3	25	3000	Hatem	Male	Alhoyla	Office
6	25	4000	Osman	Female	Alhoyla	Office
7	20	800	Ali	Male	Algwaz	Health ensurance
3	15	1000	Ismail	Male	Algwaz	Health ensurance
5	20	1600	Ishag	Male	Algwaz	Health ensurance
8	22	1200	Awad	Male	Algwaz	Health ensurance
2	13	1400	Ahmed	Male	Alhsnab	Health ensurance
3	22	1220	Masor	Male	Alhsnab	Health ensurance
2	18	700	Adam	Male	Alhsnab	Health ensurance
5	26	2500	Fathi	Male	Alhsnab	Land

Results and Discussion



Livelihoods Map

Results and Discussion

- **Trade-In and Trade-Out Analysis** (Wages bring money into the village and wage\ work taking money out of the village)

- Trade-in and trade-out analysis outlines the flow of commodities and services in and out of the village. Using GIS, which integrated all the trade-in and trade-out for the three villages and stored it to one geo database system and layers as show in attribute table below and *Map* , will help planning and decision making users who use the system to quarry, analyze, and visualize objects on geo-referencing (GPS) map for the three villages together for the purpose of understanding the flow of commodities and services in and out of a village before planning or managing activities.

Trade_in_Analysis

OBJECTID *	SHAPE *	Item list	Amount in SDG	Name of the head of the family	Village name
2	Multipoint	Rice	100000	Ahmed	Alhoyla
4	Multipoint	Meat	1000000	Omer	Alhoyla
5	Multipoint	Bread	50000	Ali	Alhoyla
6	Multipoint	Tea	567800	Ishag	Alhoyla
7	Multipoint	Milk	547789	Awad	Alhoyla
9	Multipoint	Bean	78900	Mohammed	Alhoyla
10	Multipoint	Kesra	40000	Nor	Alhoyla
11	Multipoint	Sugar	67800	Abdo	Alhoyla
12	Multipoint	Vegtable	35600	Hatim	Alhoyla
13	Multipoint	Bread	400000	Sad	Algwaz
14	Multipoint	Bean	68000	Mustfa	Algwaz
15	Multipoint	Milk	49000	Amer	Algwaz
16	Multipoint	Sugar	30000	Mubark	Algwaz
17	Multipoint	Vegtable	358888	Osman	Algwaz
24	Multipoint	Sugar	300000	Abed	Alhsnab
25	Multipoint	Bread	34095	Nahim	Alhsnab
26	Multipoint	Kesra	38900	Isam	Alhsnab
27	Multipoint	Bean	49000	Bakri	Alhsnab
28	Multipoint	Milk	900000	Ziad	Alhsnab

1 (0 out of 19 Selected)

Trade_in_Analysis | Trade_out_Analysis

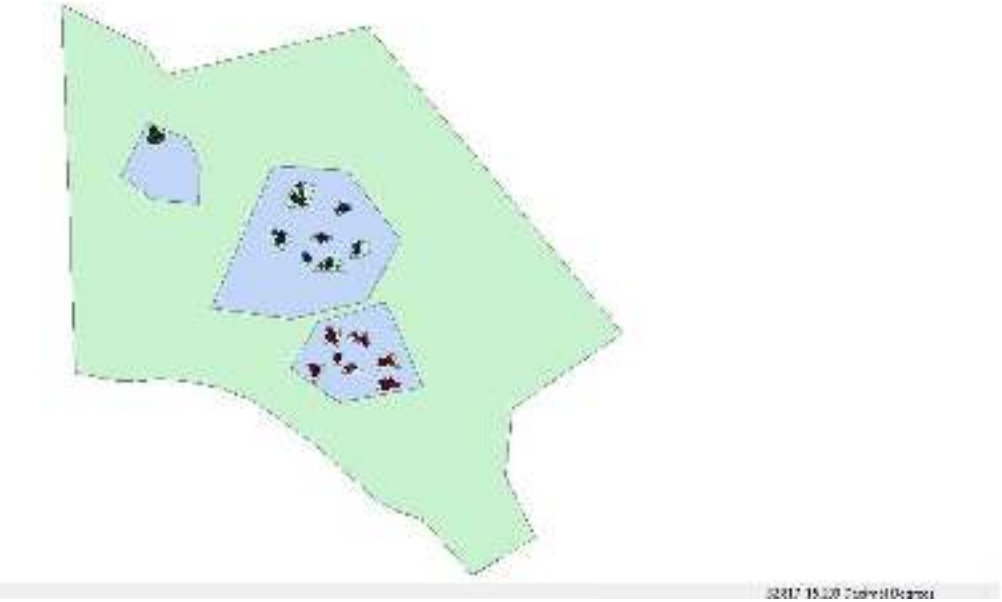
Catalog | Table

Table

Trade_out_Analysis

OBJECTID *	SHAPE *	Item list	Amount in SDG	Name of the head of the family	Village name
1	Multipoint	Clothes	200050	Amar	Alhoyla
2	Multipoint	Medcine	400921	Bakri	Alhoyla
4	Multipoint	Elctricity	30000	Hamid	Alhoyla
5	Multipoint	Water	788801	Ali	Alhoyla
7	Multipoint	Water	2000	Mustafa	Algwaz
8	Multipoint	Clothes	50002	Adam	Algwaz
9	Multipoint	Medcine	30084	Awed	Algwaz
10	Multipoint	Clothes	36003	Alsair	Algwaz
11	Multipoint	Water	1500	Tegani	Alhsnab
12	Multipoint	Clothes	30021	Abdeen	Alhsnab
13	Multipoint	Medcine	39903	Ibarhim	Alhsnab
14	Multipoint	Elctricity	23860	Salah	Alhsnab

Results and Discussion



Trade-In and Trade-Out map

Results and Discussion

- **Vulnerability Analysis**

- The vulnerability analysis depicts a profile of the vulnerable people in the village. It aims to depict the risks and dangers faced by the village and coping mechanisms people use in risk management.
- Using GIS which integrated all the vulnerable people information's and coping mechanisms for the three villages and stored it to one geo database system and layers as shown in the attribute table below and *Map* , will help planning and decision making users who use the system to quarry, analyze, and visualize objects on geo referencing (GPS) map for the three villages together, for the purpose of understanding the situation of vulnerable people and coping mechanisms they use for risk management before planning or managing activates.

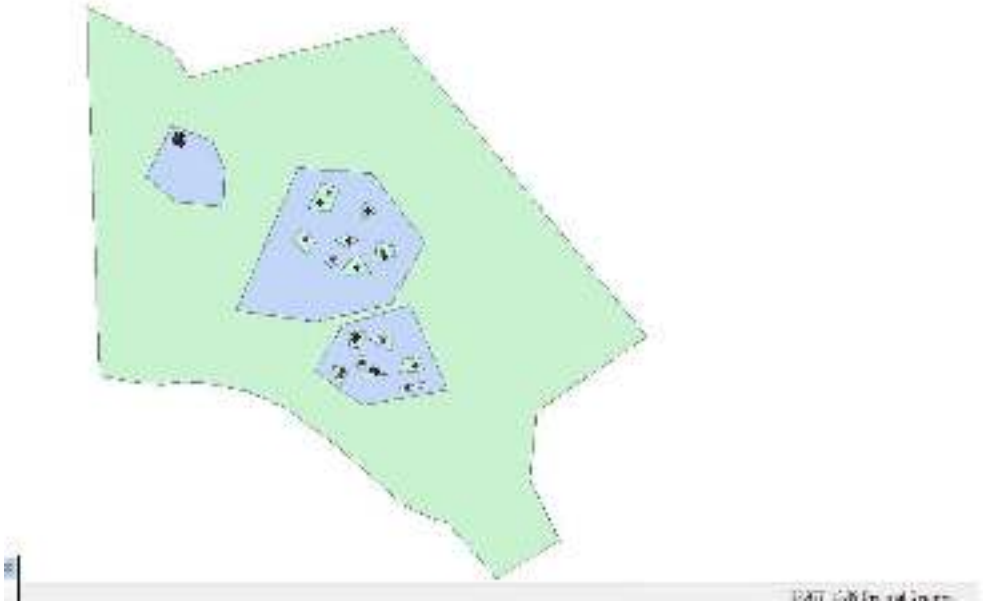
Vulnerability_Analysis

OBJECTID *	SHAPE *	Type of Vulnerability	Village_name	Gender	Pension	Who take care	Health_Status	Person_name
21	Point	Disable	Alhoyla	Female	No	Brother	Bad	Ahlam
22	Point	Disable	Alhoyla	Female	No	Brother	Good	Thoiba
23	Point	Disable	Alhoyla	Female	No	Brother	Good	Nadia
24	Point	Disable	Alhoyla	Female	No	Mother	Good	Widad
25	Point	Old Age	Alhoyla	Male	Yes	No one	Bad	Ahmed
26	Point	Old Age	Alhoyla	Female	Yes	No one	Good	Muna
27	Point	Orphans	Alhoyla	Male	No	Mother	Good	mohammed
28	Point	Orphans	Alhoyla	Female	No	Mother	Good	Eman
29	Point	Orphans	Alhoyla	Male	No	Mother	Good	Ibrahim
30	Point	Orphans	Alhoyla	Female	No	Mother	Good	Enas
31	Point	People With HIV	Alhoyla	Male	No	Borther	Good	Emad
32	Point	Widow	Alhoyla	Female	Yes	Father	Good	Nada
33	Point	Widow	Alhoyla	Female	No	Brother	Good	Abear
34	Point	Widow	Alhoyla	Female	No	Sister	Good	Huda
35	Point	Disable	Algwaz	Male	No	Brother	Bad	Mohamed
36	Point	Disable	Algwaz	Male	Yes	Sisiter	Bad	Ali
37	Point	Old Age	Algwaz	Female	No	Brother	Bad	Eshraga
38	Point	Old Age	Algwaz	Female	Yes	Son	Good	Hawa
39	Point	Old Age	Algwaz	Male	No	Sister	Very good	Omer
40	Point	Orphans	Algwaz	Male	No	Sisiter	Very good	Ahmed
41	Point	Orphans	Algwaz	Female	No	Sisiter	Good	Zahra
42	Point	Widow	Algwaz	Female	No	Brother	Good	Hala
43	Point	Widow	Algwaz	Female	No	Father	Good	Noor
44	Point	Disable	Alhsnab	Male	No	Father	Bad	Amar
45	Point	Disable	Alhsnab	Female	No	Father	Bad	Hind
46	Point	Disable	Alhsnab	Male	No	Brother	Bad	Sad
47	Point	Disable	Alhsnab	Male	No	Sister	Good	Mustafa
48	Point	Old Age	Alhsnab	Female	Yes	Brother	Bad	Suad
49	Point	Old Age	Alhsnab	Male	Yes	No one	Good	Hassan
50	Point	Orphans	Alhsnab	Female	No	Brother	Good	Busian
51	Point	Orphans	Alhsnab	Female	No	Uncle	Good	Sahar
52	Point	Widow	Alhsnab	Female	No	Father	Good	Nahid
53	Point	Widow	Alhsnab	Female	Yes	Father	Good	Hanan
54	Point	Widow	Alhsnab	Female	No	Father	Good	Safa

1 (0 out of 34 Selected)

Vulnerability_Analysis

Results and Discussion



Vulnerability map

Results and Discussion

- **Income and Expenditure Analysis (3 Different Types of Poor Families)**

- The income and expenditure analysis reveals the vulnerabilities of a household as well as its coping mechanisms.
- Using GIS, which integrated all the Income and Expenditure for three different types of poor families from the three villages and stored it to one geo database system and layers as show in attribute table below and *Map* will help planning and decision making users who use the system to quarry, analyze, and visualize objects on geo-referencing (GPS) map for the three villages together to understand the situation of vulnerable people and coping mechanisms they use for risk management before planning or managing activities

Table

Income_statment

OBJECTID *	SHAPE *	Item list	Amount Price(SDG)	Name of the head of the family *	Village name
4	Point	Worker	400	Mohamed	Alhoyla
5	Point	Harvest	200	Mohamed	Alhoyla
6	Point	Agric	300	Mohamed	Alhoyla
7	Point	Worker	400	Osman	Alhoyla
8	Point	Agric	300	Osman	Alhoyla
9	Point	Worker	600	Ali	Alhoyla
10	Point	Worker	700	Bakri	Algwaz
11	Point	Worker	600	Hamdan	Algwaz
12	Point	Worker	500	Emad	Algwaz
13	Point	Worker	600	Muhand	Alhsnab
14	Point	Rent	700	Tareg	Alhsnab
15	Point	Worker	500	Haidar	Alhsnab

1 (0 out of 12 Selected)

Income_statment | Expenditure_statment

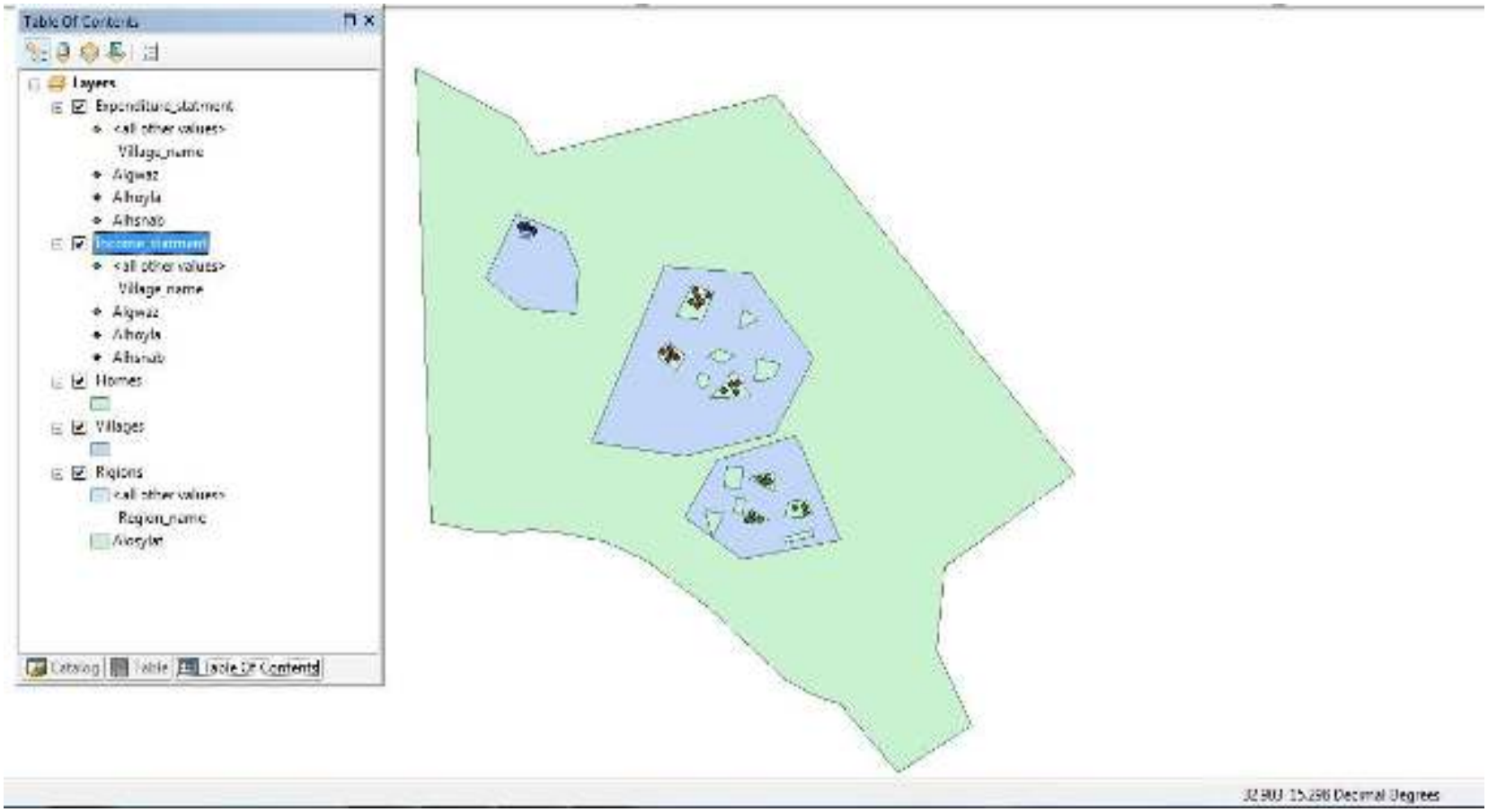
Catalog | Table

Table

Expenditure_statment

OBJECTID *	SHAPE *	Item list	Amount Price (SDG)	Name of the head of the family	Village name
10	Point	Sugar	60	Mohamed	Alhoyla
11	Point	Tea	40	Mohamed	Alhoyla
12	Point	Meat	30	Moahmed	Alhoyla
13	Point	Bread	50	Mohamed	Alhoyla
14	Point	Oil	20	Mohamed	Alhoyla
15	Point	Vegtable	100	Mohamed	Alhoyla
16	Point	Bread	150	Osman	Alhoyla
17	Point	Rice	50	Osman	Alhoyla
18	Point	Oil	40	Osman	Alhoyla
19	Point	Sugar	50	Osman	Alhoyla
20	Point	Vegtable	90	Osman	Alhoyla
21	Point	Meat	30	Osman	Alhoyla
22	Point	Oil	50	Ali	Alhoyla
23	Point	Vegtable	100	Ali	Alhoyla
24	Point	Sugar	40	Ali	Alhoyla
25	Point	Meat	30	Ali	Alhoyla
26	Point	Bread	50	Ali	Alhoyla
27	Point	Sugar	50	Bakri	Algwaz
28	Point	Oil	60	Bakri	Algwaz
29	Point	Meat	15	Bakri	Algwaz
30	Point	Bread	30	Bakri	Algwaz
31	Point	vegtable	90	Bakri	Algwaz
32	Point	Oil	30	Hamdan	Algwaz
33	Point	Bread	50	Hamdan	Algwaz
34	Point	Milk	90	hamdan	Algwaz
35	Point	Tea	30	Hamdan	Algwaz
36	Point	Sugar	50	Hamdan	Algwaz
37	Point	Oil	30	Emad	Algwaz
38	Point	Bread	50	Emad	Algwaz
39	Point	Vegtable	100	Emad	Algwaz
40	Point	Rice	40	Emad	Algwaz
41	Point	Bread	40	Muhand	Alhsnab
42	Point	Sugar	50	Muhand	Alhsnab
43	Point	Oil	40	Muhand	Alhsnab
44	Point	Vegtable	90	Muhand	Alhsnab
45	Point	Sugar	50	Tareg	Alhsnab
46	Point	Oil	30	Tareg	Alhsnab
47	Point	Bread	50	Tareg	Alhsnab

Results and Discussion



Income and Expenditure map

Results and Discussion

- **The market analysis (Local Opportunity Analysis)**
- pinpoints products and services that come in to and out of the market and opportunities for employment.
- Using GIS, which integrated all the Local Opportunity for the three villages and stored it to one geodatabase system and layers as show in the attribute table below and *Map* , will help planning and decision making users who use the system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map or the three villages together to understand the situation of local opportunity in the villages before planning or managing activities.

Local_opportunities_analysis

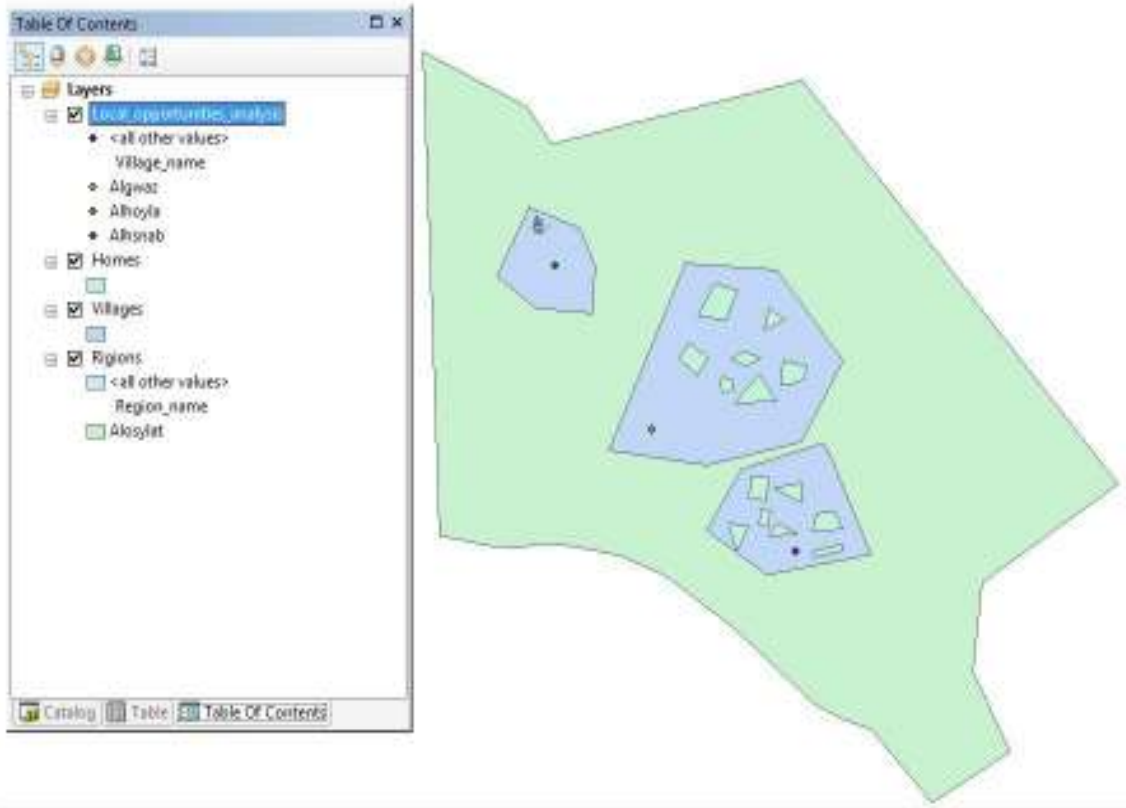
OBJECTID *	SHAPE *	Services/ Products/ Processing Units	Village_name
3	Point	Market	Alhoyla
4	Point	Market	Algwaz
5	Point	Bank	Alhsnab

1 (0 out of 3 Selected)

Local_opportunities_analysis

Catalog Table

Results and Discussion



market analysis (Local Opportunity Analysis)

Results and Discussion

- **24-Hour Analysis (3 Different Types of Poor Families)**

- The 24-hour analysis shows the activities in which a household engages within 24 hours period.
- Using GIS, which integrates all the 24-hours activities for three different types of poor families from the three villages and storing it to one geodatabase system and layers, as shown in the attribute table below and *Map* , will help planning and decision making users who use the system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map for the three villages together to understand the conditions of 24-hours activities before planning or managing activities.

Table

oneday_work_analysis

OBJECTID *	SHAPE *	Type of work	Name of the person	Gender	Name of the head of the family	From ..... - 7.00 a.m	From 7.00 – 10.00 a.m	From 10.00 – 1.00 p.m	From 4.00 -7.00 p.m
106	Point	Factory Worker	Osman	Male	Osman	Not doing	Doing	Doing	Doing
107	Point	Kesra Saler	Mona	Female	Osman	Not doing	Doing	Doing	Doing
108	Point	Cooking and Clean	Eman	Female	Osman	Not doing	Doing	Doing	Not doing
109	Point	Cloth Washing	Eman	Female	Osamn	Not doing	Not doing	Not doing	Not doing
110	Point	Water Saler	Musa	Male	Emad	Not doing	Doing	Doing	Doing
111	Point	Cabnter	Omer	Male	Emad	Not doing	Doing	Doing	Doing
112	Point	Tea Slaer	Nada	Female	Emad	Not doing	Doing	Doing	Not doing
113	Point	Cooking and Clean	Nada	Female	Emad	Not doing	Not doing	Not doing	Doing
114	Point	Tea Slaer	Enas	Female	Mohammed	Not doing	Doing	Doing	Doing
115	Point	Factory Worker	Halima	Female	Mohammed	Not doing	Doing	Doing	Doing
116	Point	Tea Slaer	Amona	Female	Mohammed	Not doing	Doing	Doing	Not doing
117	Point	Cooking and Clean	Amuna	Female	Mohammed	Not doing	Not doing	Not doing	Doing
118	Point	Factory Worker	Mustafa	Male	Ahmed	Doing	Not doing	Not doing	Not doing
119	Point	Factory Worker	Emad	Male	Ahmed	Doing	Not doing	Not doing	Not doing
120	Point	Factory Worker	Watheg	Male	Ahmed	Doing	Not doing	Not doing	Not doing
121	Point	Cooking and Clean	Sumaia	Female	Ahmed	Not doing	Doing	Doing	Not doing
122	Point	Land Keper	Ahmed	Male	Hamid	Doing	Doing	Doing	Doing
123	Point	Factory Worker	Omer	Male	Hamid	Doing	Not doing	Not doing	Not doing
124	Point	Factory Worker	Shazly	Male	Hamid	Doing	Not doing	Not doing	Not doing
125	Point	Factory Worker	Ameer	Male	Hamid	Doing	Not doing	Not doing	Not doing
126	Point	Factory Worker	Moniam	Male	Esam	Not doing	Doing	Doing	Doing
127	Point	Factory Worker	Sad	Male	Esam	Doing	Not doing	Not doing	Not doing
128	Point	Cabnter	Esam	Male	Esam	Not doing	Doing	Doing	Doing
129	Point	buildder	Mohammed	Male	Esam	Not doing	Doing	Doing	Doing
130	Point	Cooking and Clean	Sara	Female	Mutwakel	Not doing	Doing	Doing	Not doing
131	Point	Tea Slaer	Halima	Female	Mutwakel	Not doing	Doing	Doing	Doing
132	Point	Cooking and Clean	Kaltoum	Female	Mutwakel	Not doing	Doing	Doing	Not doing
133	Point	Tea Slaer	Isharga	Female	Mutwakel	Not doing	Doing	Doing	Doing
134	Point	Tea Slaer	Zainab	Female	Osman	Not doing	Doing	Doing	Doing
135	Point	Factory Worker	Hassan	Male	Osman	Not doing	Doing	Doing	Doing
136	Point	Factory Worker	Yeasean	Male	Osman	Doing	Not doing	Not doing	Not doing
137	Point	Factory Worker	Osman	Male	Osman	Not doing	Doing	Doing	Doing
138	Point	Building	Hatem	Male	Hatem	Not doing	Doing	Doing	Doing
139	Point	Tea Slaer	Amna	Male	Hatem	Not doing	Doing	Doing	Not doing
140	Point	Cooking and Clean	Hala	Male	Hatem	Not doing	Doing	Doing	Doing
141	Point	Tea Slaer	Sahar	Female	Hatem	Not doing	Doing	Doing	Not doing
142	Point	Factory Worker	Awad	Male	Mohammed	Doing	Not doing	Not doing	Not doing

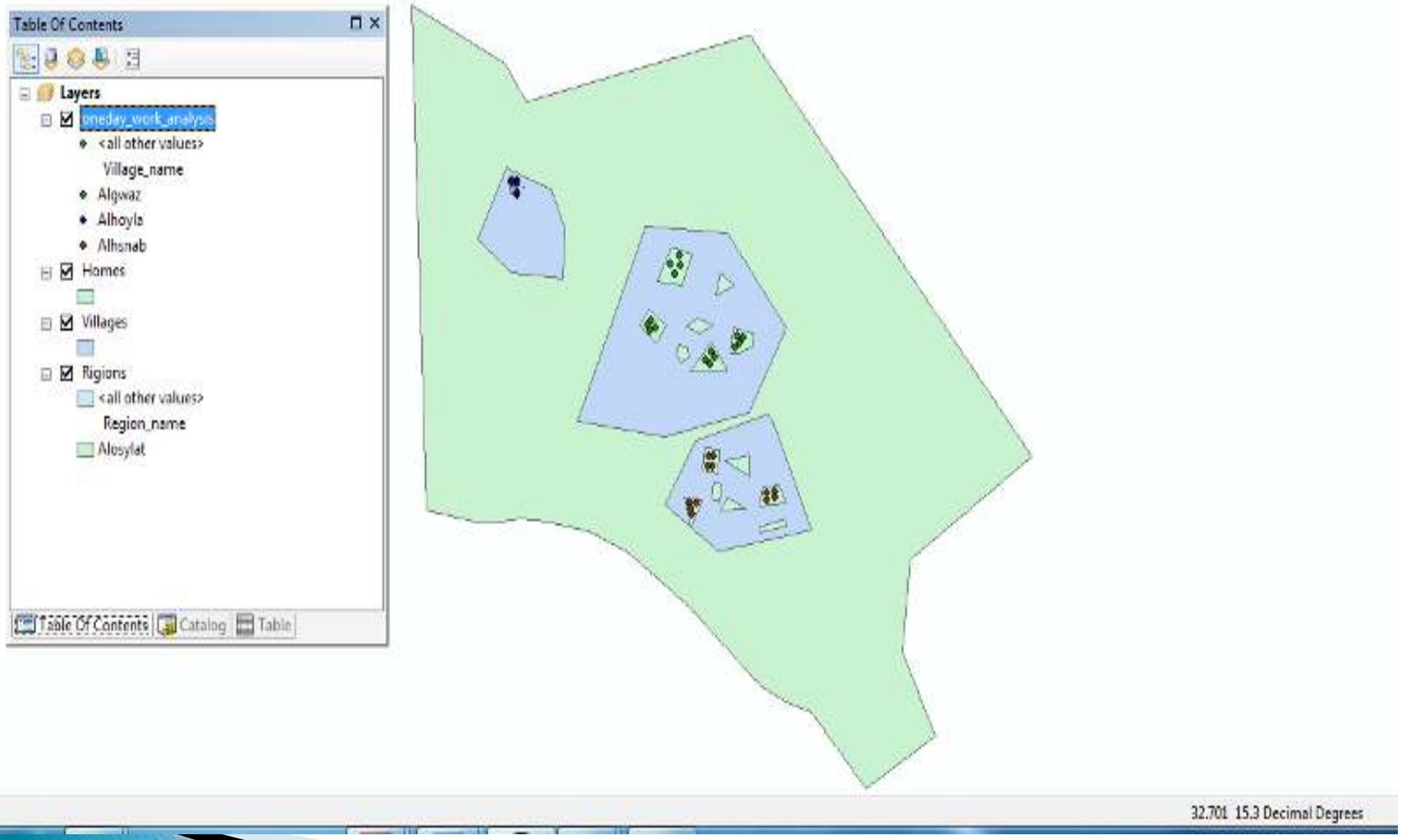
1 (0 out of 40 Selected)

oneday_work_analysis

Catalog Table

From 7.00 –	Village_name	Gender based job restrictions
Not doing	Alhoyla	This job for male and female
Not doing	Alhoyla	This job for female
Not doing	Alhoyla	This job for female
Doing	Alhoyla	This job for female
Not doing	Alhoyla	This job for male
Not doing	Alhoyla	This job for male
Doing	Alhoyla	This job for female
Doing	Alhoyla	This job for female
Doing	Alhoyla	This job for female
Not doing	Alhoyla	This job for male and female
Not doing	Alhoyla	This job for female
Not doing	Alhoyla	This job for female
Doing	Algwaz	This job for male and female
Doing	Algwaz	This job for male and female
Doing	Algwaz	This job for male and female
Not doing	Algwaz	This job for female
Doing	Algwaz	This job for male
Doing	Algwaz	This job for male and female
Doing	Algwaz	This job for male and female
Doing	Algwaz	This job for male and female
Not doing	Algwaz	This job for male and female
Doing	Algwaz	This job for male and female
Not doing	Algwaz	This job for male
Not doing	Algwaz	This job for male
Not doing	Algwaz	This job for female
Doing	Algwaz	This job for female
Not doing	Algwaz	This job for female
Not doing	Algwaz	This job for female
Not doing	Alhsnab	This job for female
Not doing	Alhsnab	This job for male and female
Doing	Alhsnab	This job for male and female
Not doing	Alhsnab	This job for male and female
Not doing	Alhsnab	This job for male
Not doing	Alhsnab	This job for female
Not doing	Alhsnab	This job for female
Not doing	Alhsnab	This job for female
Doing	Alhsnab	This job for male and female

Result and Discussion



24-Hour Analysis map

Results and Discussion

365-Day Analysis

- The 365-day analysis singles out the number of days of activities in which a household engages (male and female) within the time frame of a year.
- Using GIS, which will integrates the total number of days of activities for one year for the three different types of poor families from the three villages and will store it to one geo database system and layers, as show in the attribute table below and *Map* , will help planners and decision- making users who use the system to system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map for the three villages together. It will enable the them to understand the condition of the number of days of activities for a year can affect the village before planning or managing activities begins.

one_year_work_analysis

OBJECTID *	SHAPE *	Type of work	Name_of_the_head_of_the_family	Jan (F)	Jan (M)	Feb (F)	Feb(M)	March (F)	March (M)	Apr (F)	Apr (M)	May (F)	May (M)	Jun (F)	Jun (M)	Jul (F)
3	Point	Worker	Amed	00	01	03	01	00	08	13	01	11	14	16	13	12
4	Point	Kesra Saler	Ahmed	06	00	18	00	11	00	06	00	21	00	13	00	10
5	Point	Raksha Driver	Ahmed	00	03	00	04	00	07	00	13	00	14	00	15	00
6	Point	Worker	Ali	06	09	08	11	05	10	05	13	12	26	12	25	08
7	Point	Water Saler	Ali	00	10	00	08	00	04	00	22	00	20	00	22	00
8	Point	Cabnter	Amar	00	08	00	07	00	04	00	20	00	17	00	14	00
9	Point	Water Saler	Amar	00	11	00	11	00	18	00	13	00	17	00	21	00
10	Point	Tea Slaer	Nazar	9	00	05	00	11	00	08	00	08	00	13	00	10
11	Point	Worker	Nazar	15	12	15	10	11	15	21	15	22	22	23	23	26
12	Point	Tea saler	Baket	9	00	08	00	20	00	13	00	17	00	12	00	26
13	Point	Worker	Baket	13	26	09	07	13	14	03	15	17	17	19	20	17
14	Point	Worker	Mubark	12	06	06	06	12	24	16	01	20	23	21	23	19
15	Point	Worker	Mubark	8	05	06	14	11	17	06	13	17	13	04	21	17
16	Point	Worker	Abden	8	16	14	14	12	16	07	11	11	09	14	14	16
17	Point	Worker	Abden	7	17	09	07	10	12	15	13	06	12	13	15	13
18	Point	Land Keper	Hashem	0	21	00	23	00	13	00	21	00	21	00	20	00
19	Point	Worker	Hashem	22	25	18	22	29	20	09	12	16	19	17	17	20
20	Point	Worker	Emad	23	22	25	25	19	16	14	24	18	18	17	18	17
21	Point	Worker	Emad	27	22	23	08	15	07	11	14	18	20	14	18	16
22	Point	Worker	Haisam	28	22	22	13	10	06	15	11	15	19	14	16	16
23	Point	Worker	Haisam	27	21	11	09	09	07	13	08	13	16	13	16	18

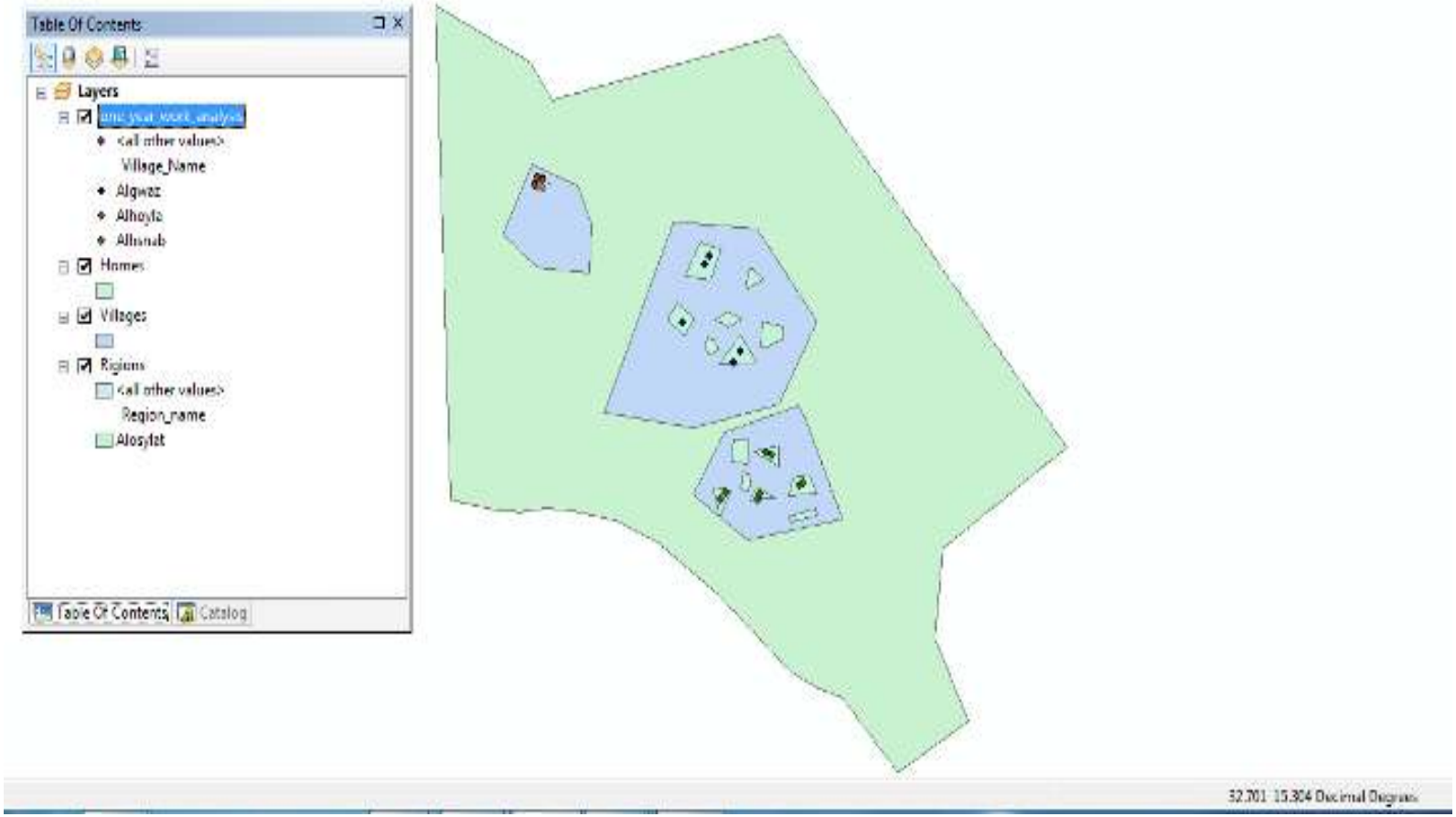
1 (0 out of 21 Selected)

one_year_work_analysis

Catalog Table

Sep (M)	Oct (F)	Oct (M)	Nov (F)	Nov (M)	Dec (F)	Dec (M)	Village Name
12	12	8	13	16	22	11	Alhoyla
00	21	0	24	0	16	0	Alhoyla
14	0	13	0	14	0	7	Alhoyla
19	12	24	11	23	11	25	Alhoyla
15	0	28	0	14	0	16	Alhoyla
21	0	23	0	19	0	21	Alhoyla
20	0	26	0	20	0	21	Alhoyla
00	26	00	23	00	17	00	Algwaz
19	22	19	19	19	23	24	Algwaz
00	30	00	15	00	26	00	Algwaz
19	17	16	21	18	20	19	Algwaz
19	21	24	18	23	21	20	Algwaz
19	15	04	19	20	19	19	Algwaz
15	16	16	20	18	16	18	Alhsnab
18	17	20	20	20	17	13	Alhsnab
21	00	17	00	14	00	15	Alhsnab
10	11	17	12	16	18	18	Alhsnab
06	05	07	20	13	10	12	Alhsnab
09	07	07	19	17	05	16	Alhsnab
11	12	08	20	15	12	16	Alhsnab
06	08	06	16	12	10	12	Alhsnab

Results and Discussion



The 365-day analysis

Results and Discussion

- **Seasonality Analysis**

- The seasonality analysis identifies various factors that affect village life i.e. providing or denying credit, employment, immigration, migration, diseases and festivals.
- Using GIS, which integrated all the factors that affect the seasonality for the three villages and stored it to one geo database system and layers as shown in the attribute table below and *Map*, will help planners and decision-making users who use the system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map for the three villages together. It will enable them to understand the conditions that seasonality as well as other various factors that affect the village before planning or managing activities begins.

Table

Seasonality

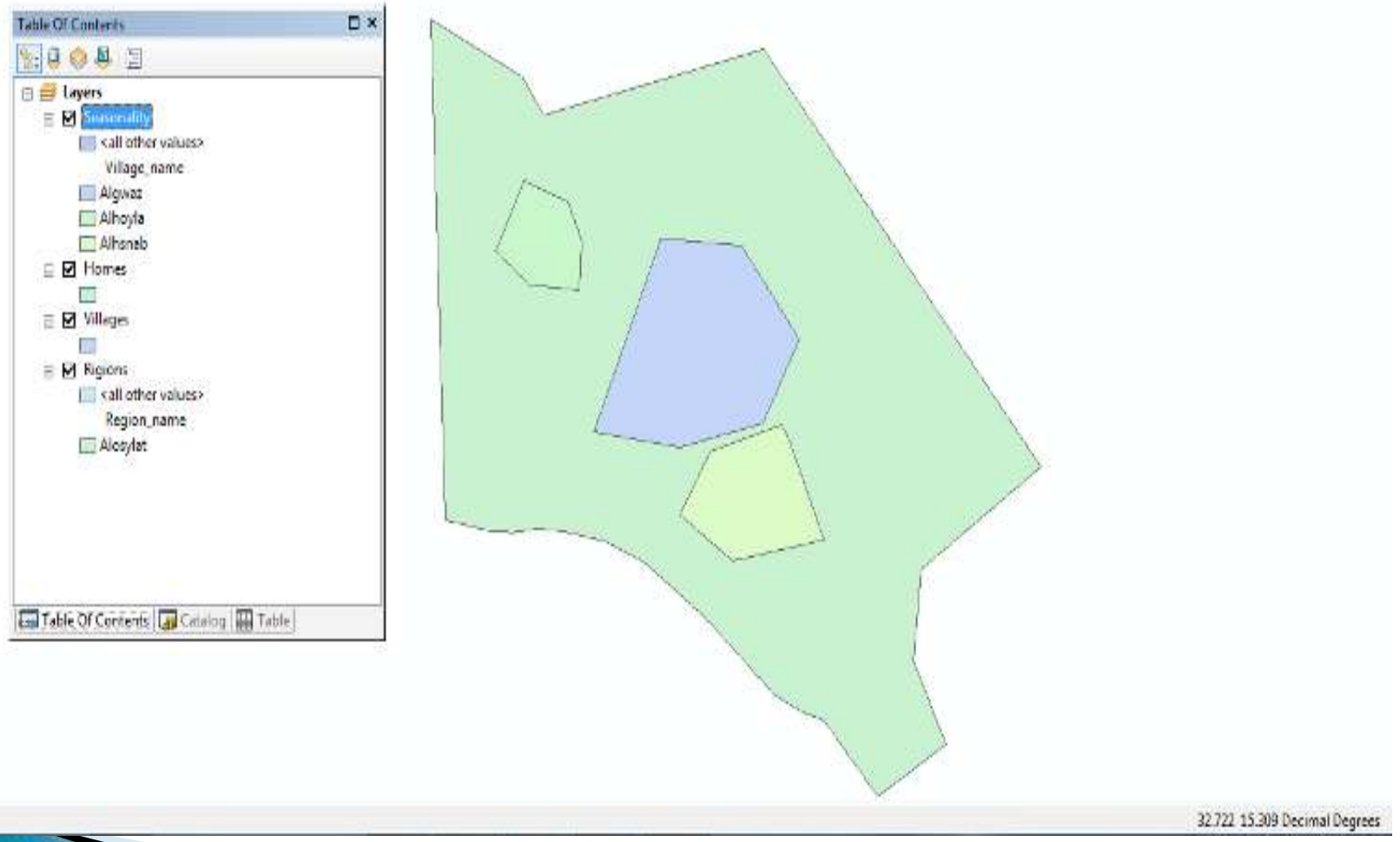
OBJECTID *	SHAPE *	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	Polygon	Marriage,Mlaria	Work, Labour Requirement	Purchase,Marketing	Work	Work	Work	Credit	Festivals	Marriage
2	Polygon	Marketing, Purchase, Marriage	Work,Mlaria	Credit	Work	Labour Requirement	Marketing, Purchase	Marketing, Purchase	Festivals	Marriage
3	Polygon	Mlaria	Work	Labour Requirement	Work	Work	Credit	Festivals,	Labour Requirement	Labour Requirement

Table

Seasonality

Jul	Aug	Sep	Oct	Nov	Dec	SHAPE_Length	SHAPE_Area	Village name	How to use
Credit	Festivals	Marriage	Credit	Mlaria	Marriage	6605.458435	2907631.17183	Alhoyla	E:\Dr.Eljak \How to use Seasonlity.docx
Marketing, Purchase	Festivals	Marriage	Credit	Mlaria	Marriage	14098.890997	12961520.320469	Algwaz	E:\Dr.Eljak \How to use Seasonlity.docx
Festivals,	Labour Requirement	Labour Requirement	Marketing, Purchase	Mlaria	Labour Requirement	9487.677489	5522651.319235	Alhsnab	E:\Dr.Eljak \How to use Seasonlity.docx

Results and Discussion



Seasonality Analysis

Results and Discussion

- **Migration Analysis**
- The migration analysis examines the places where villagers migrate and the type of livelihoods they pursue.
- Using GIS which integrated all the Migration Analysis for the three villages and stored it to one geo database system and layers as shown in the attribute table below and *Map*, will help planners and decision making users who use the system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map for the three villages together. It will enable the researcher to understand the condition of various factors that affect the village before planning or managing activities begins.

Table

Migration_analysis

OBJECTID *	SHAPE *	Name of Migratied Families	Name of The Work in the Migratied place	The Migratied Place	Period (In Months)	Terms & Conditions	Village name
2	Point	Mohamed	Worker	Sudai	40	Bad	Alhoyla
3	Point	Hassan	Enginer	Sudia	30	Very Good	Alhoyla
4	Point	Emad	Doctor	Sudia	12	Very Good	Alhoyla
5	Point	Ali	Teacher	Egypt	20	Good	Alhoyla
6	Point	Mubark	Worker	Canda	8	Bad	Alhoyla
7	Point	Esa	Woker	Sudia	23	Good	Algwaz
8	Point	Said	Worker	Sudia	25	Good	Algwaz
9	Point	Osman	Worker	Sudia	50	Good	Alhsnab
10	Point	Haidar	Woker	Sudia	60	Good	Alhsnab

1 (0 out of 9 Selected)

Migration_analysis

Catalog Table

Results and Discussion

Migration Analysis map

Results and Discussion

- **Credit Mapping Analysis**

- Credit mapping indicates the reasons for, the source of, and amount of loans.
- Using GIS, which integrated all the credit analysis for the three villages and stored it to one geo database system and layers as shown in the attribute table below *and Map*, will help planners and decision-making users who use the system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map for the three villages together. It will enable them to understand the conditions that impact credit as well as other various factors that affect the village before planning or managing activities begins.

Table

Credit_analysis

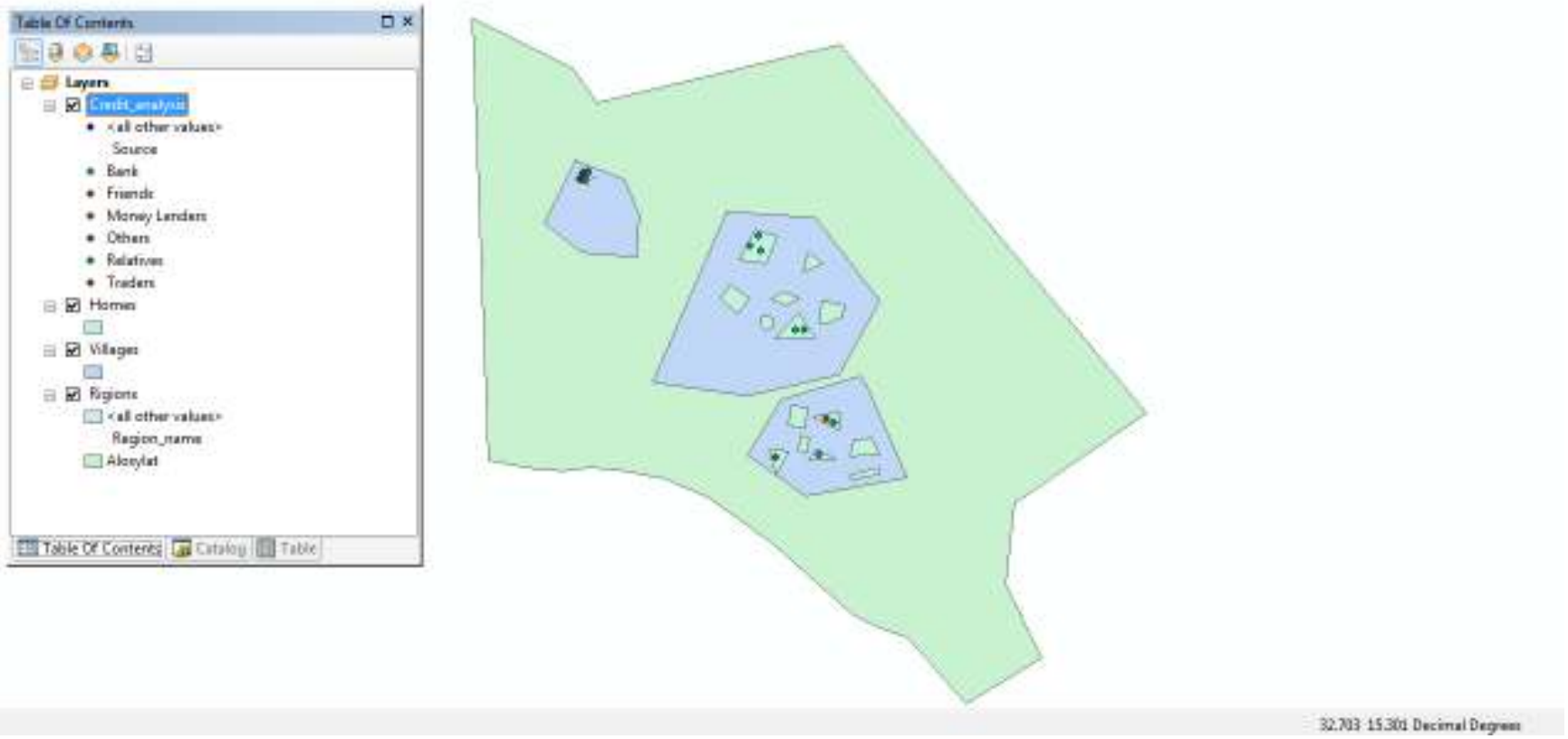
OBJECTID *	SHAPE *	Name of the head of the family	Average Loan Amount	Source	Village name	Debtor name	Debtor pic	Seasonality	Loan Purpose	Terms & Conditions	Gender
2	Point	Ali Mohamed	7000	Bank	Algwaz	Omer	E:\Dr.Eljak \deabtor.jpg	Winter	life	Very good	Male
3	Point	Ali mohammed	4000	Bank	Algwaz	Amera	<Null>	Kharef	life	Bad	Female
4	Point	Ali	10000	Bank	Algwaz	Mohammed	<Null>	Summer	life	Bad	Male
6	Point	Osman	400000	Friends	Alhoyla	Ali	<Null>	Winter	life	Bad	Male
7	Point	Osman	347000	Bank	Alhoyla	Zainab	<Null>	Winter	life	Bad	Female
8	Point	isha	24921000	Bank	Alhoyla	Ahmed	<Null>	Summer	life	Good	Male
9	Point	Ahmed	234500	Bank	Alhoyla	Salah	<Null>	Summer	life	Very good	Male
10	Point	noor	234000	Bank	Alhoyla	Amer	<Null>	Summer	life	Bad	Male
11	Point	Asrar	5000	Traders	Alhoyla	samer	<Null>	Kharef	agric	Good	Male
12	Point	Ahmed	23000	Bank	Algwaz	Sami	<Null>	Winter	Marriage	Very good	Male
13	Point	Hamed	6500	Money Lenders	Alhsnab	Adel	<Null>	Winter	Disease	Good	Male
14	Point	Hamad	348870	Bank	Alhsnab	Osman	<Null>	Kharef	Bulding	Bad	Male
15	Point	rared	2399	Bank	Alhsnab	Sad	<Null>	Kharef	Bulding	Bad	Male
16	Point	Hassan	2300	Relatives	Alhsnab	Modser	<Null>	Winter	Disease	Bad	Male
17	Point	Ajhmed	238600	Bank	Algwaz	Abdo	<Null>	Kharef	Agric.	Bad	Male

1 (0 out of 15 Selected)

Credit_analysis

Catalog Table

Results and Discussion



Credit Mapping Analysis

Result and Discussion

- **Health/Disease Analysis**

- The health/disease analysis shares the results of the health profile of the village.
- Using GIS, which integrated all the disease analysis for the three villages and stored it to one geo database system and layers as shown in the attribute table below and *Map* , will help planners and decision-making users who use the system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map for the three villages together. It will enable them to understand the conditions that impact health as well as other various factors that affect the village before planning or managing activities begins .

Table

Diseases_Analysis

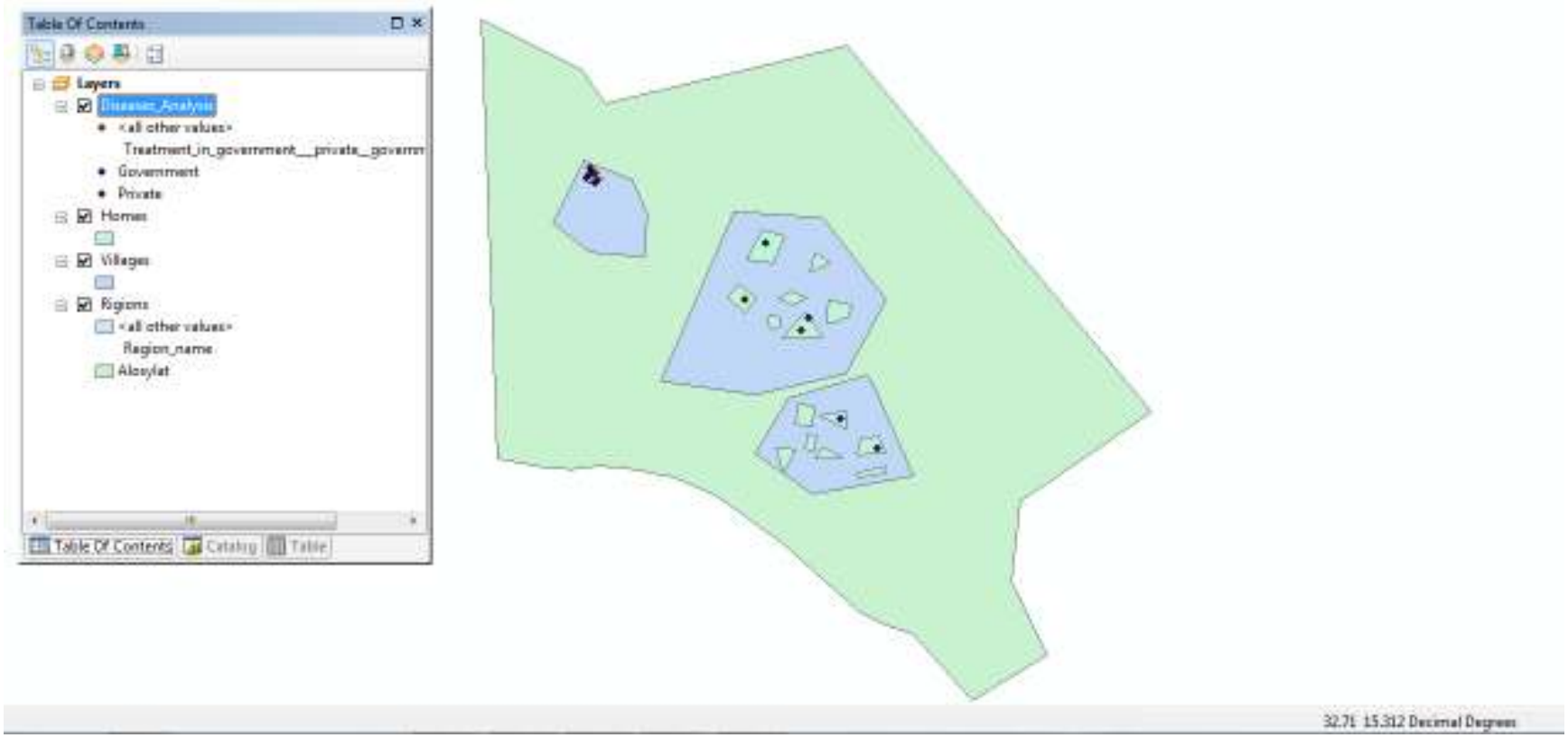
OBJECTID *	SHAPE *	Name of Diseases	Name of Patents	Causes	Treatment in government/ private	Cost per Month in SDG	Village name	Gender
13	Point	Sugar	Mohamed	Gentics	Private	2000	Alhoyla	Male
14	Point	Kideny failure	Alwia	Unknown	Government	1000	Alhoyla	Female
15	Point	Cartilage	Fatma	hardwork	Private	400	Alhoyla	Female
16	Point	Pressure	Jamal	Gentics	Government	400	Alhoyla	Male
17	Point	Sugar	Omer	Gentics	Government	300	Alhoyla	Male
18	Point	Cancer	Batol	Gentics	Private	1000	Alhoyla	Male
19	Point	Cancer	Ahmad	Gentics	Government	1500	Alhoyla	Female
20	Point	Pressure	Isam	Gentics	Private	300	Alhoyla	Male
21	Point	Sugar	Mahasen	Gentics	Government	2000	Algwaz	Female
22	Point	Pressure	Sumia	Gentics	Private	1000	Algwaz	Female
28	Point	Cancer	Enam	Gentics	Government	800	Alhsnab	Female
29	Point	Kideny failure	Ali	Unknown	Government	800	Alhsnab	Male
30	Point	Pressure	Amar	Gentics	Private	400	Algwaz	Male
31	Point	Sugar	Badran	Gentics	Government	300	Algwaz	Male

0 (0 out of 14 Selected)

Diseases_Analysis

Catalog Table

Results and Discussion



Health/Disease Analysis

Results and Discussion

- **Education analysis**

- The education analysis portrays the education profile of the village.
- Using GIS which integrated all the education analysis for the three villages and stored it to one geo database system and layers as show in the attribute table and *Map*, will help planners and decision-making users who use the system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map for the three villages together. It will enable the researcher to understand the impact of education as well as other various factors that affect the village before planning or managing activities begins.

Table

Education_analysis

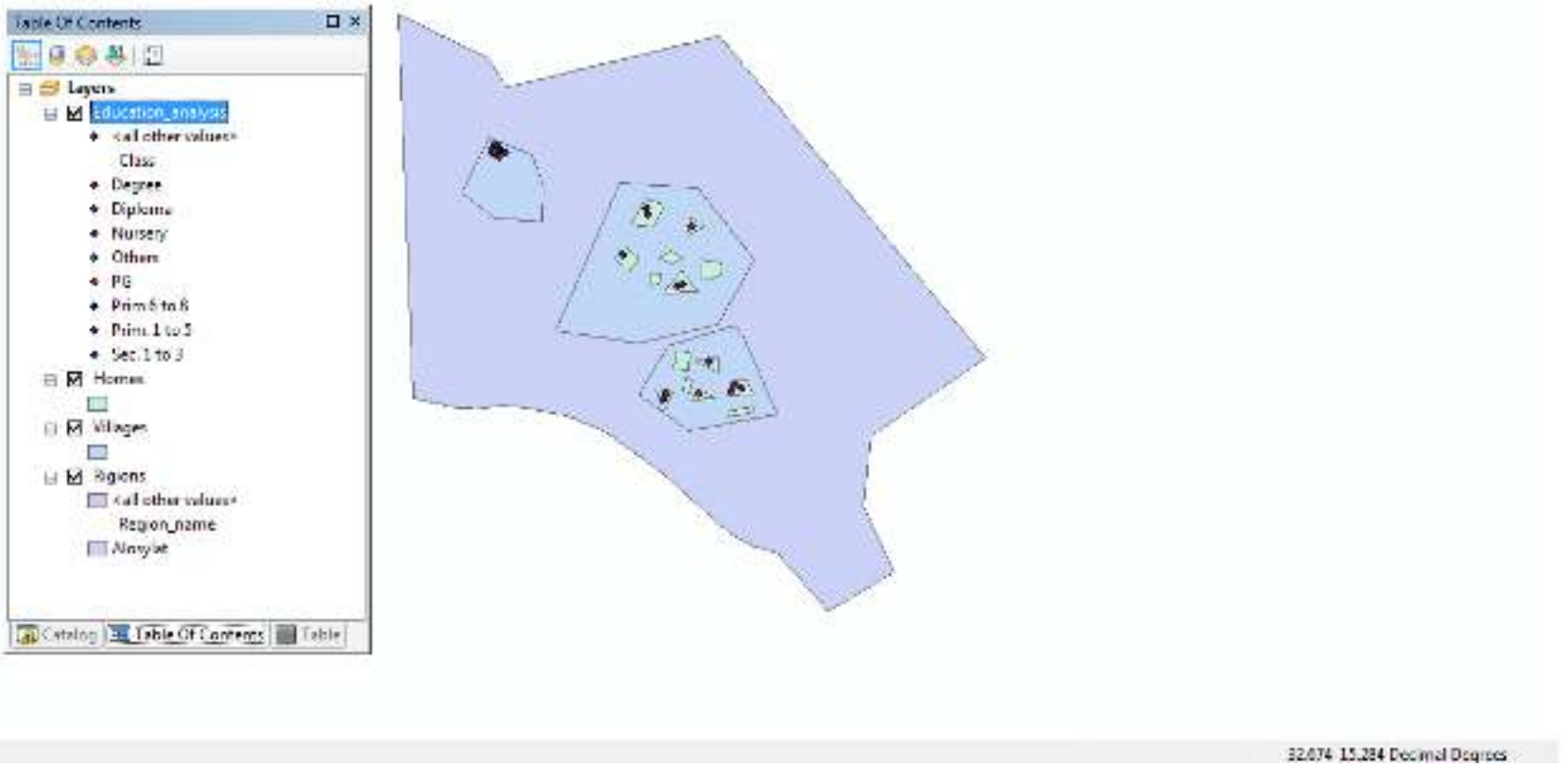
OBJECTID *	SHAPE *	Class	Type	Name of Persons	Gender	Ownership	Village Name
2	Point	Prim. 1 to 5	School	Nada	Female	Government	Alhoyla
3	Point	Nursery	School	Hanadi	Female	Government	Alhoyla
4	Point	Prim 6 to 8	School	Ahmed	Male	Private	Alhoyla
5	Point	Diploma	College	Numan	Male	Government	Alhoyla
6	Point	Degree	College	Nazar	Male	Government	Alhoyla
7	Point	Prim. 1 to 5	School	Omnia	Female	Private	Alhoyla
8	Point	Sec. 1 to 3	School	Isa	Male	Private	Alhoyla
9	Point	Nursery	School	Amar	Male	Government	Alhoyla
10	Point	Diploma	College	Fatma	Female	Private	Alhoyla
11	Point	PG	College	Abber	Female	Private	Alhoyla
12	Point	Prim 6 to 8	School	khaled	Male	Private	Alhoyla
13	Point	Others	School	Mohammed	Male	Government	Alhoyla
14	Point	Sec. 1 to 3	School	Yeaser	Male	Government	Alhoyla
15	Point	Nursery	School	Ismail	Male	Private	Alhoyla
16	Point	Diploma	College	Adnan	Male	Private	Alhoyla
17	Point	Sec. 1 to 3	School	Mubark	Male	Government	Alhoyla
18	Point	Degree	College	Batol	Female	Private	Alhoyla
19	Point	Sec. 1 to 3	School	Enas	Female	Government	Alhoyla
20	Point	Diploma	College	Eman	Female	Private	Alhoyla
21	Point	PG	College	Suma	Female	Private	Alhoyla
22	Point	Nursery	School	Amna	Female	Government	Alhoyla
23	Point	Sec. 1 to 3	School	Isharga	Female	Government	Alhoyla
24	Point	Nursery	School	Em tnan	Female	Government	Algwaz
25	Point	Sec. 1 to 3	School	Gasem	Male	Private	Algwaz
26	Point	Nursery	School	Tareg	Male	Private	Algwaz
27	Point	PG	College	Haidar	Male	Private	Algwaz
28	Point	Nursery	School	Sad	Male	Private	Algwaz
29	Point	Diploma	School	Mustafa	Male	Private	Algwaz
30	Point	Nursery	School	Isam	Male	Government	Alhsnab
31	Point	Diploma	College	Mojtaba	Male	Private	Alhsnab
32	Point	Degree	College	Bakri	Male	Government	Alhsnab
33	Point	Nursery	School	Muiam	Male	Government	Alhsnab
34	Point	PG	College	Gabani	Male	Private	Alhsnab
35	Point	PG	College	Ahlam	Female	Private	Alhsnab
36	Point	Prim. 1 to 5	School	Amira	Female	Private	Alhsnab

1 (0 out of 35 Selected)

Education_analysis

Catalog Table

Results and Discussion



Education analysis map

Result and Discussion

- **Institutional Analysis**

- The institutional analysis presents data collected on all formal and informal organizations, youth groups, government units, NGOs and others and opportunities to access their services.
- Using GIS, which integrated all the Institutional for the three villages and stored it to one geodatabase system and layers as show in the attribute table below and *Map*, will help planners and decision-making users who use the system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map for the three villages together. It will enable the researcher to understand the impact of institutions as well as other various factors that affect the village before planning or managing activities begins.

Table

Institution analysis

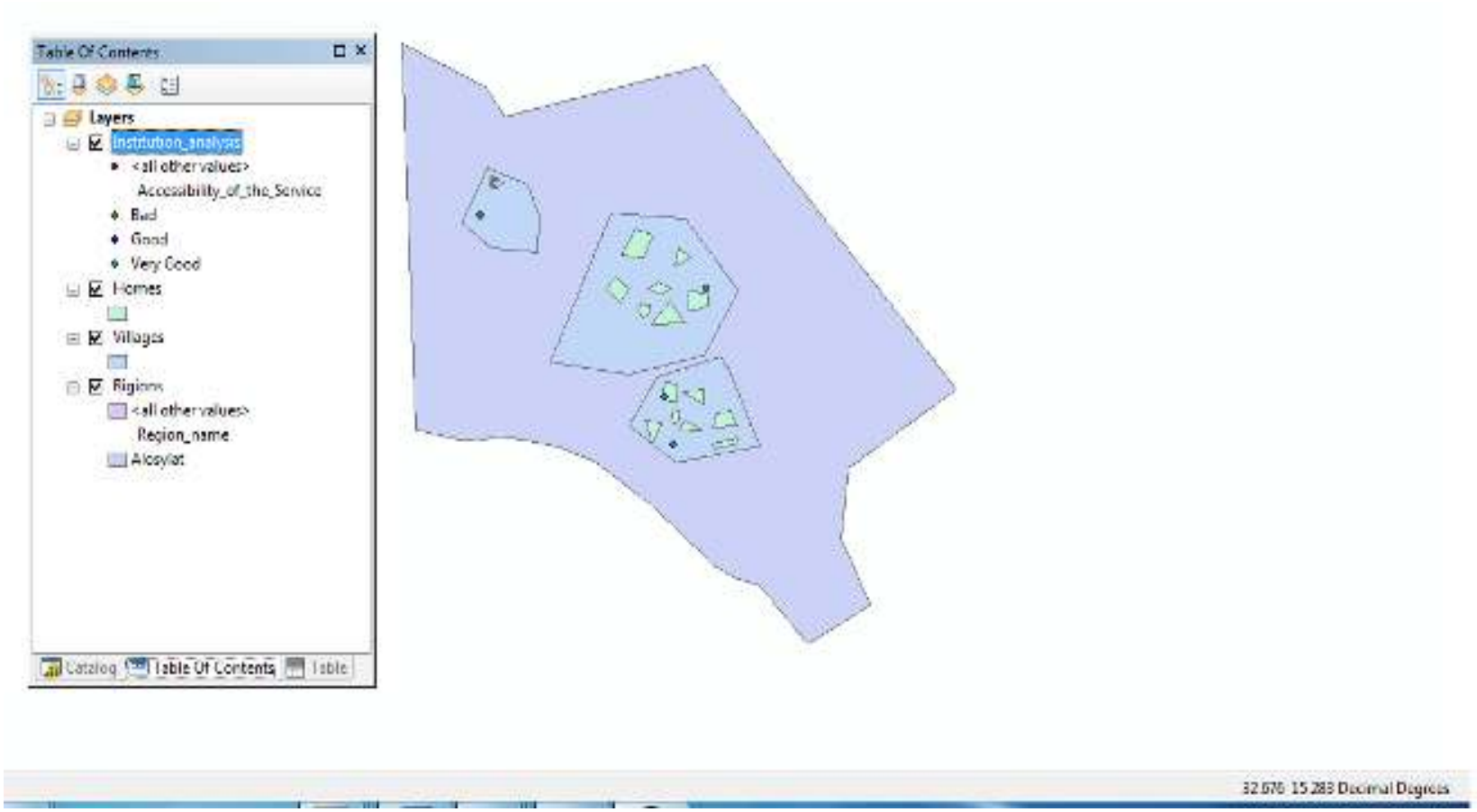
OBJECTID *	SHAPE *	Institutions / Community Based Organization	Members Type	No of members	Purpose of the Service	Name of the Service	Accessibility	Quality	Village name
2	Point	Social Club	Association	60	Social relation	Social	Very Good	Good	Altayib
5	Point	Sport club	Association	180	Sport	Sport	Very Good	Bad	Algereu...
6	Point	Social Club	Association	150	Social relation	Social	Very Good	Bad	Alhanab
7	Point	Sport club	Association	40	Sport	Sport	Very Good	Good	Alhanab

(0 out of 4 Selected)

Institution_analysis

Table

Results and Discussion



Institutional Analysis map

Results and Discussion

- **Enterprise Mapping Analysis**

- Enterprise mapping records the existing enterprises, their issues and scope for more enterprises or improvements in the existing ones. Using GIS, which integrated all the existing enterprises for the three villages and stored it to one geodatabase system and layers as show in the attribute table below *and Map* , will help planners and decision-making users who use the system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map for the three villages together. It will enable the researcher to understand the impact of existing enterprises as well as other various factors that affect the village before planning or managing activities begins.

Results and Discussion

- **Education and Health Ranking Analysis**
- The education and health-ranking tool helps to rank status of availability of education and health services in any village/location.
- Using GIS, which will integrate all the Education and Health Ranking for the three villages and stored it to one geo database system and layers as show in the attribute table below and Maps , will help planners and decision-making users who use the system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map for the three villages together. It will enable the researcher to see the impact of health services and education as well as other various factors that affect the village before planning or managing activities begins.

Table

Health_Ranking_1

OBJECTID *	SHAPE *	Hospital_distance	Hospital_distance_Score	Health_centers_distance	Health_centers_distance_Score	MBBS_clinic_distance	MBBS_clinic_distance_score	MD_clinic_distance
1	Polygon	More than 5km	04	More than 1km	06	More than 10km	02	More than 10km
2	Polygon	More than 1km	06	More than 1km	06	More than 10km	02	More than 10km
3	Polygon	No services	01	More than 5km	04	More than 10km	02	More than 10km

Table

Health_Ranking_1

MD_clinic_distance_Score	Pharmacy_distance	Pharmacy_distance_Score	The Decision Index (DI)	SHAPE_Length	SHAPE_Area	Village name	How to use
02	More than 5km	04	3	6605.458435	2907631.17183	Alhoyla	E:\Dr.Eljak\How to use Edu and Heal Ranking.docx
02	More than 5km	04	4	14098.890997	12961520.320469	Algwaz	E:\Dr.Eljak\How to use Edu and Heal Ranking.docx
02	More than 5km	04	2	9487.677489	5522651.319235	Alhsnab	E:\Dr.Eljak\How to use Edu and Heal Ranking.docx

Table

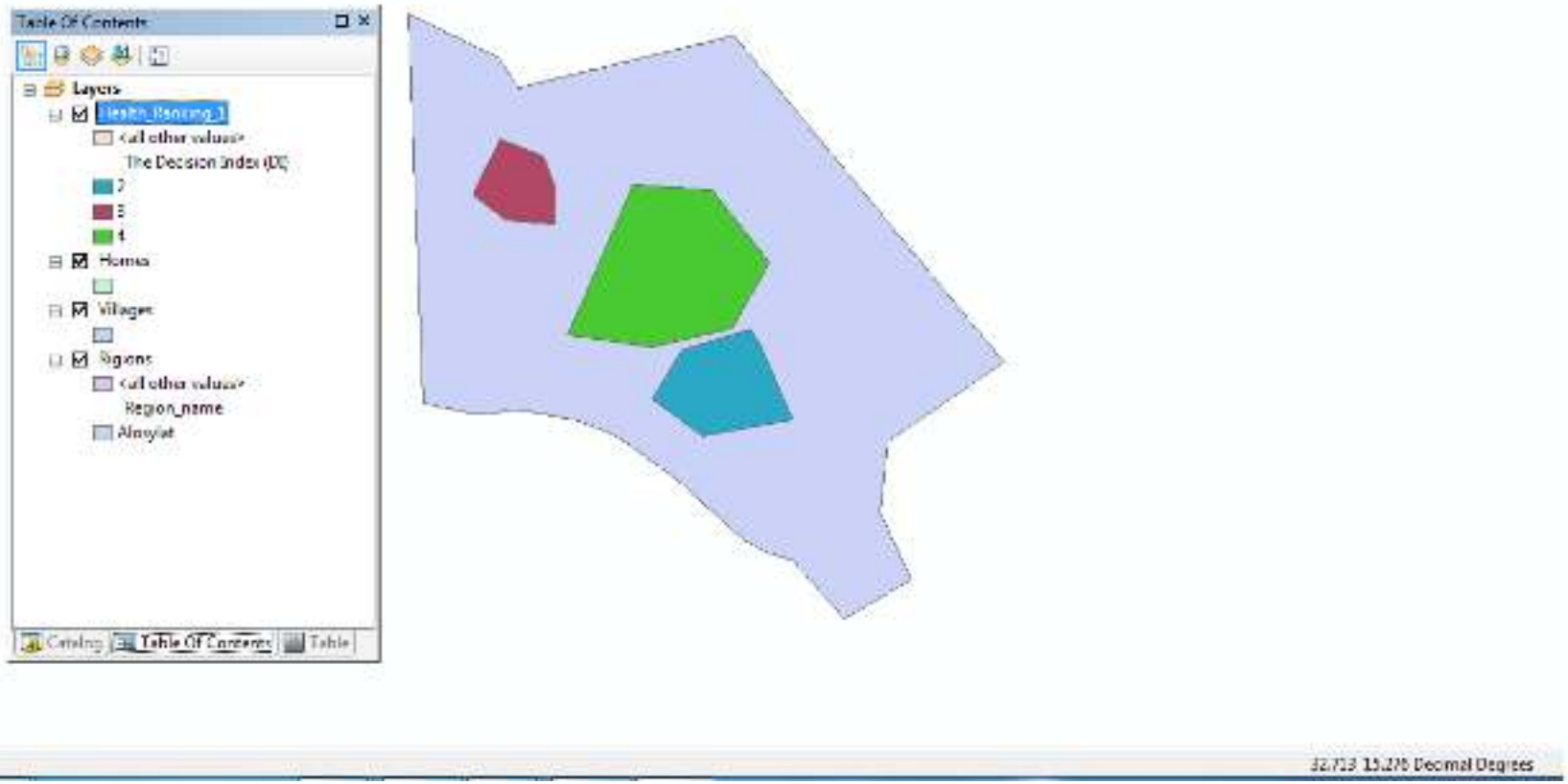
Education_Ranking1

OBJEC	SHAPE *	Primary_School_distance	Primary_School_Sc	Secondary_School_distance	Secondary_School_Scor	Arts_commerce_Science_College_distance	Arts_commerce_Science_Colle	Engineering_Medical_college_distance
1	Polygon	More than 1km	08	More than 1km	08	More than 10km	02	More than 10km
2	Polygon	In village	07	More than 1km	06	More than 10km	02	More than 10km
3	Polygon	More than 5km	04	More than 5km	04	More than 10km	02	More than 10km

Education_Ranking1

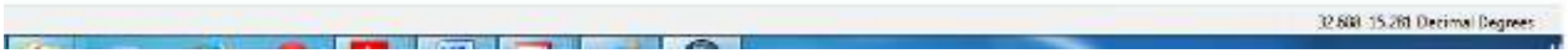
Engineering_Medical_college_Scor	Computer_Centre_Facility_distance	Computer_Centre_Facility_Score	SHAPE_Length	SHAPE_Area	Village Name	The Decision Index (DI)	How to use
02	More than 5km	04	6605.458435	2907631.17183	Alhoyla	4	E:\Dr.Eljak\How to use Edu and Heal Ran
02	More than 5km	04	14098.890997	12961520.320469	Algwaz	4	E:\Dr.Eljak\How to use Edu and Heal Ran
02	More than 5km	04	9487.677489	5522651.319235	Alhsnab	3	E:\Dr.Eljak\How to use Edu and Heal Ran

Results and Discussion



Health Ranking Analysis map

Results and Discussion



Education Ranking Analysis map

Results and Discussion

- **Demand Estimation Analysis**

- Demand estimation for a product will include the cumulative demand for the product/service in the market. Using GIS, which integrated all of the demand estimation for a product for the three villages and stored it to one geo database system and layers as show in the attribute table below will help planners and decision-making users who use the system to quarry, analyze, and visualize objects on the geo-referencing (GPS) map for the three villages together. It will enable the researcher to understand the impact the cumulative demand for the product/service in the market as well as other various factors that affect the village before planning or managing activities begins.

Table

Villages

OBJECTID *	SHAPE *	SHAPE_Length	SHAPE_Area	Village Name	Demand Estimation
1	Polygon	6605.458435	2907631.17183	Alhoyla	D:\Msc\My research\joan\Done\demand.docx
2	Polygon	14098.890997	12961520.320469	Algwaz	<Null>

1 (0 out of 2 Selected)

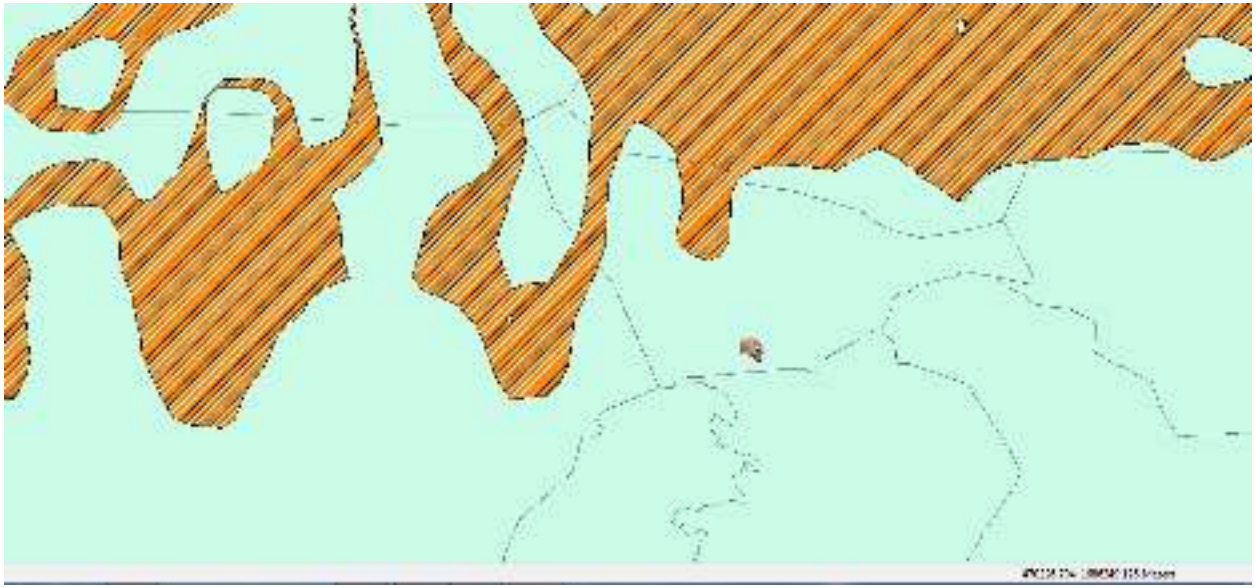
Villages

Catalog Table

Results and Discussion

- **19.Climate Change Analysis**
- The climate change analysis tool is used by the GIS to predict and quantify the impact of changing perception and increasing temperature on livelihoods that depend on the vegetation in the study areas (up to 2050).
- *Maps below* show that the study area of the Alosylat region is out of the affected zone of climate change predicted for Sudan in 2050, and its livelihood (natural vegetation and cultivated land) depends whether it falls on the safe side of climate change .
- The data is used in this research to predict and quantify the impacts of changing perception and increasing temperature on livelihoods (up to 2050) in the study areas that depend on vegetation is real data from the free datasets portals ESGF https://esg-dn1.nsc.liu.se/search/cordex/

Climate Change Analysis map



Climate Change Analysis map

FUTURE OF THE STUDY

- The findings of this study will benefit society because bottom-up planning plays an important role in the success of the policy.
- This process can be used in addition to village and micro level planning systems as well as planning at the regional and national levels.
- The greater demand for Electronic Governance (E-Governance) in Sudan justifies the need for research of GIS. Local level planners, development practitioners and government officials that apply the recommended approach derived from the results of this study will be able to enhance their plan and decision making for livelihoods development.
- The study will eliminate gaps in knowledge in livelihoods development by integrating information of the LEAP tool with participatory GIS.
- This study will help other researchers to use the same approach to cover additional regions in Sudan. (*The system has the potential to store unlimited villages numbers).*
- The same study may be used to establish a web-GIS

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- Questions