Strengthening Emergency Response Abilities
SERA Project

Vulnerability Profile: SUMMARY

Badawacho Woreda (district)
Hadiya Zone
Southern Nations, Nationalities and Peoples Region

2000

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1. Methodology

1.1 Sources of data

- Secondary documents, literatures and maps
- Primary from the Key informants, focus group discussion and households

1.2 Determination of sampling units & procedures of primary data collection

Sampling Units

- The wereda is stratified into two traditional agro-climatic zones namely kolla with 13 PAs and Weina dega with 33 PAs.
- Then 2 PAs from kolla and 4 PAs from weina dega were randomly selected for the household survey

Household Survey

- One EA is randomly selected from each sampled PA
- All of the household heads of the selected EAs were recorded so as to use it as a frame book
- 100 household heads were sampled from each EA. 594 of them responded out of the 600 sampled household heads
- Included are all eligible women aged 15-49 years in the selected households to fill the women's questionnaires. Out of the 809 women identified to be eligible in the wereda, 712 of them responded and 694 of them were measured for anthropometric purpose.
- All children aged 3 to 36 months are included in the anthropometeric surveying. Out of the 254 children identified to be eligible in the 6 sample PAs, 218 of them were measured.

Key Informant's Interview

- A minimum of 15 knowledgeable key informants were carefully selected from each of the sampled PAs and interviewed in specific topics. Among these are knowledgeable and influential youth, women, elders, PA leaders, DAs, school principals and health workers
- Two to three wereda officials were also interviewed to get ideas on some topics

Community Focus Group Discussion

- A day- long community focus group discussion was conducted in each sample PA. 6 to 8 knowledgeable elders were carefully selected from each sample PA to freely give their views on common issues and problems. Two of the focus group members were made women in each sample PA so as not to miss gender sensitive issues.

1.3 Analytical Methods

- Qualitative analysis
- Univariate analysis
- Bivariate analysis across AEZ and sex (bivariate cross tabulation tables are widely applied)
- Multivariate analysis (multivariate cross tabulation tables and binary logistic regression)

1.4 Training

Different types of training were organized at various levels so as to enable successful data collection, analysis and report writing. Accordingly two weeks training accompanied with practical exercises was provided to enumerators, supervisors and RRA team members at zonal level besides provision of SPSS for DOS and WIN at Federal level mainly for SERA staff. In addition, various discussion forums were organized at Federal level in order to improve capacity of vulnerability analysis.

1.5 Limitations/Constraints

For such profile is the first of its type to be prepared at local level with locally available experts, lack of well established experiences in the preparation of such profiles and scarcity of related literature can be considered as the major limitation of this study. In fact, various efforts were made by the stakeholders at every level so as to minimize the negative impacts of such limitations.

2. Background of the study area

Name of the study wereda

Badawacho now, formerly Sike up to 1988

Geographical location

Between 7^0 05' 00" to 7^0 16' 00" North Latitude and 37^0 46'00" to 38^0 o6' 00" East Longitude

Relative location

Badawacho is bounded by Alaba wereda of KAT and Siraro wereda of Oromiya in the north, Kadida Gamela and Kachabira weredas of KAT in the west and Damot Gale, Damot Weyde and Boloso Sore weredas of the newly formed Welaita Zone in the south. Its capital Shone, located at about 345 kilometers away to the south of Addis on the asphalt road running from Addis to Arbaminch divides the wereda into east and west.

Major category	Sub category	Number/%
Total population in 1992	**Male**	104119 (50.4 %)
	Female	102467 (49.6 %)
	Total	**206586 (100.0 %)**
	Rural	195858 (94.8 %)
	Urban	10727 (5.2 %)
	Total	**206586 (100.0 %)**
population density in 1992 (persons/km^2)	**Crude**	365
	Agricultural	390
Ethnic Composition (1987)	**Hadiya**	82.1 %
	Kembata	5.5 %
	Aleba	4.7 %
	Welayta	3.8 %
	Oromo	2.0 %
	Others	1.9 %
	Total	**100.0 %**
Religious Composition	**Christian**	77.7 %
	Muslim	19.0 %
	Others	3.0 %
	Total	**100.0 %**
Mother Tongue Language	**Hadiyagna**	78.8 %
	Kembategna	9.3 %
	Alebagna	4.9 %
	Wolaitegna	4.5 %
	Amaharic	1.8 %
	Others	0.7 %
	Total	**100.0 %**
Mean Annual Rainfall in mm	**Kolla**	953.4
	Weina Dega	1892.14
Mean Annual Temperature in Degree Celsius	**Kolla**	17.6-20.0
	Weina Dega	20.1-22.5
Range of Elevation m.a.m.s.l	**Wereda**	1580-2200
Total Area (km^2)	**Wereda**	566.75

3. Main Findings.

3.1 Physical, Demographic and Environmental Issues

With regard to the average land holding size of the households, all sources of data were found closer to each other. The average land holding size for the whole wereda was reported to be 0.8 hectare in secondary data, and this was found 0.62 hectare in the household survey for the year 1992. Based on the results of household survey, the situation was better in Kolla, here the average land holding size was 0.79 hectare, whereas, it was only 0.54 hectare in weina dega. Besides this, the proportion of households with the average land holding of 0.50 hectare or less was found more or less similar in all sources of data. Accordingly, this proportion was found to be 32.2% according to secondary data, 47.6% according to key informants and 57.1% according to the household survey result.

Generally, land is the most- scarce resource throughout the wereda, most scarce in the intermediate high land or weina dega AEZ. In fact, weina dega's carrying capacity is better than that of kolla, due to the fact that wide variety of crops grow besides better land cover compared to kolla.

Besides scarcity, land resources are highly depleted. About 90 % of the total land area are already cultivated in the wereda. Practices such as land fallowing are almost impossible due to shortage of land. Similarly, land area with natural forests is almost non-existent at present. Rather, every field is invaded by Eucalyptus plantation. Due to repeated cultivation, soils are exposed to both visible erosion and invisible depletion. Land holding is not only small but also less productive in the wereda. Both the key informants and the community focus groups loudly stated that it is becoming impossible to produce without the application of chemical fertilizers.

With regard to the livestock density, it was calculated to be 202 TLU per square kilometer for the year 1992. The livestock are entirely local breeds known for their low productivity. The 1997 Woody Bio Mass study also indicated that the livestock carrying capacity of the wereda has already passed its critical.

Reflecting large population over small land various population densities were found very high. Accordingly, crude population density which was observed to be 268 persons/KM2 in the year 1977, was jumped to 311 persons/Km^2 in the year 1987 and calculated to be 365 persons/Km^2 in the year 1992. On the other hand, the agricultural densities were calculated to be 279 persons/Km^2, 318 persons/Km^2 and 372 persons/Km^2 in the years 1977,1987 and 1992 respectively. Closer gaps between agricultural and crude population densities indicate that the agricultural land in the wereda is already cultivated.

The population of Badawacho is not only dense but also heavily dominated by the young dependents. The young dependency ratio for the whole wereda was 87.0 % while for the rural area was 87.5 % in the year 1987. Whereas, the over all dependency ratio was 89.5 % and 89.9 % for the whole wereda and the rural areas respectively in the same year.

The major environmental problems reported to have been affecting the livelihoods in the wereda are soil erosion and depletion, land fragmentation, deforestation, pasture problems and flooding and water logging. The root causes and their consequences are briefly discussed in the following table.

Environmental Problems and Their Consequences -Badawacho (1992)

Type of Environmental problem.	Root Causes of	Consequences in the livelihoods.
Soil erosion and depletion	- Deforestation. - Mono cultural practices. - Over cultivation. - Planting Eucalyptus trees near and in the farming fields. - Using dung as fuel wood	- Decreased productivity of the land. - Increased poverty
Deforestation	- Rapid population growth. - Expansions of farm lands. - Search for fuel and construction woods. - Charcoal production.	- Exposure of top soils for erosion. - Formation of gullies. - Loss of top soil and moisture
Pasture problems	- Rapid population growth. - Expansions of farm lands.	- Forced reduction of livestock. - Reduced livestock products.
Flooding and water logging	- Deforestation. - Non-integrated soil and water conservation works. - Flat topography of land. - Heavy clay soil. - Hilly/sloping/ topography	- Poor soil drainage - Destruction of crops. - Favored conditions for the reproduction of vector insects.

Source: CADs in the sample PAs of the wereda.

3.2 Access to Essential Services and Infrastructures

The essential services and infrastructures to which the community's accessibility situation are assessed include primary schools, health institutions and immunization services, agricultural extension, clean water supply, roads and major weekly markets.

Primary schools are among the most important socioeconomic infrastructures up on which communities' vulnerability to various risks partly depends on. According to the secondary data sources, about 50 % of the rural PAs in Badawacho wereda do not have

primary schools within the PAs. This shows that children in the remaining 50 % of the PAs in the wereda are either attending schools with greater difficulty or unable to attend primary school level education at the right age. Due to the lack of age data for children enrolled in primary schools, net enrollment ratio for the wereda is not calculated. As a result, only gross enrollment ratio is computed. Here, gross enrollment is meant to be the ratio of total number of students enrolled in primary schools regardless of their age to the total expected age group (7-14 years) of population in the given area. The current gross enrollment ratio in primary schools of the wereda, are about 40 % and 30 % for boys and girls respectively, revealing that boys are better enrolled than girls.

On the other hand, the current dropout rates are 27.7% for boys and 18.8% for girls. The major reasons behind dropouts from primary schools for boys are mainly related to poor economic backgrounds of their families. The details include low level of family income, lack of awareness about the benefits of education, sickness, problem of the family, circumcision during regular education program (time), over crowding in a classroom, shortage of school furniture, family enforcement towards early marriage, joining military force, low interest towards education program by local language/vernacular/ and language barriers for grades above 4.

Whereas, the major reasons behind dropouts from primary schools for girls are mainly related to the poor economic backgrounds of their families and some cultural reasons. The details include low level of family income, lack of awareness about the benefits of education, sickness or poor health of the family members, negative attitude of the community towards girls' education, fear of abduction, family enforcement towards early marriage, circumcision during regular education program, over crowding in a classroom, shortage of school furniture, beginning primary education at late age, seasonal hot weather, outbreaks of epidemics and language barriers for grades above 4.

According to the key informants as well as community focus group discussions, the quality of education is deteriorating in the wereda due to very high student - classroom ratio, shortage of qualified teachers, shortage of books, absence of libraries, absence of pedagogical centers for both teachers and students, shortage of school furniture, and absence of school compound fences. The absence of adult literacy programs in most of the rural PAs are also contributing to the increasing rate of illiteracy of the inhabitants in Badawacho.

With regard to health institutions, currently the wereda has one health center, 5 clinics and 2 health posts to be shared by the total population of the wereda estimated to be 206586 in 1992. According to our calculations based on 1: 50,000 topographic maps, about 43% of the wereda's population are accessible to the health center within two hours single trip walking distance. Calculations indicate that almost all of the inhabitants of Badawacho are accessible to clinics within two hours walking distance. Thus, the physical availability of health institutions is not as such bad. But the quality of the service rendered by all the existing health institutes is very poor due to shortage of professional health personnel, lack of necessary medical equipment, shortage of drugs/medicines/ and supplies, and lack of vehicles to provide mobile health services.

Immunization programs are among the most essential health services upon which the health status of the community depends on. According to the results of the household survey, the coverage is very low except for Polio. The proportions of eligible children received vaccination of Polio, BCG, DPT3, and Measles are 75%, 12.1%, 35.2% and 14.4% respectively. It is only 5.4% of the wereda's eligible children who were found fully vaccinated.

The availability of quality agricultural extension is very important in improving the livelihood status of the rural communities so as to make them less vulnerable to various risks. Extension services should be diversified in order to bring more sustainable changes. As to Badawacho wereda, about 33 % of the total households are involved in food crop extension and 0.12 in the livestock extension program. The ever rising prices of agricultural inputs, falling prices of grains and the shortage of cultivable land were the major causes for the low level of participation in food crop extension. The key informants, both at wereda and PA level did not deny that the agricultural extension program in the wereda is with great emphasis to cereals. Extension programs like natural resource management and livestock improvement are almost forgotten. In addition, the veterinary clinics are almost non existent in the rural areas where the livestock are.

On the other hand, availability of extension agents (DAs) closer to the local community is among the most important inputs to make the extension works successful. Not only their presence but also their number should be reasonably proportional to number of beneficiaries. By 1991 one DA was serving about 593 households on average. It will not be easy for a single person to properly serve 523 households. When the actual situation of the distribution of DAs shows that in some areas one DA is serving about three PAs, and in some PAs even there are no assigned DAs at all. Besides this, the focus group discussion participants were found criticizing the DAs for their great emphasis to distribution of inputs and collection of debts and even land taxes rather than teaching and helping the farmers to improve their capacity of managing farms and improve productivity.

According to the 1987th Population and Housing Census, only 14% of the total rural households were accessible to potable water. But, data from the key informants and households survey result indicated that the proportion of households accessible to potable water has increased to 17.3 % in weina dega and 51 % in Kolla in 1992.

As to accessibility to roads, calculation done using the 1:50,000 topographic maps indicate that about 75 %, 17 % and 8 % of the inhabitants of the wereda are accessible to asphalt road within 15 km radius and to gravel and feeder roads within 7.5 kms radius respectively. Almost 100 % of the total rural population in Badawacho are currently accessible to the major weekly markets within one day long double trip, including the weekly markets available in the neighboring weredas.

3.3 Health, Mortality and Nutrition

The health status of children and mother may be the best indicator of a certain community's health situation. In this survey, the health status of mothers was analyzed by

assessing situation of antenatal care (ANC), Tetanus Toxoid (TT) immunization, delivery care and family planning. Where as, the health status of children was analyzed by assessing situation of immunization coverage, status of breast-feeding and illness.

Mothers were asked whether they had received medical care or not during pregnancy of the youngest child. Accordingly, about 24% in kolla and 41% in weina dega parts of the wereda went to receive medical care during pregnancy. Over all, about 35% of the pregnant women in the wereda received antenatal care during pregnancy. However, about 43% in kolla and 66% of pregnant women who received medical care in weina dega part, visited health institutes at or after 8th month of their pregnancy for the first time.

With regard to delivery care, mothers with live births within 5 years prior to the survey were asked about where and how they gave birth. About 97 % of the applicable women in the wereda gave birth at own or relatives' home. No difference was observed between the two AEZs in this regard. Over all, about 13.7 % of the women in the wereda were assisted by trained traditional birth attendants with only 0.7 % assisted by professional health personnel during delivery.

Women at reproductive age were asked about the knowledge of family planning methods. Significant proportion of the eligible women do not have problem of knowledge. However, application of family planning is still at its infancy due to various reasons. It is only 1.8% of the eligible women who were found to have ever used any family planning method in the wereda. Moreover, about 55 % of the women who have ever used any family planning methods were found dropped during the survey time. Thus, there is very high discontinuity in family planning or the number of current users is very low.

Only about 21% of the eligible women in the wereda were found to have received at least two doses of Tetanus Toxoid Immunization in connection to the recent pregnancy during the survey time. The situation is better in weina dega as compared to that of kolla where pregnant women with TTI were only 14.9 %. But it was over 24% in weina dega part.

Immunization coverage against Polio, DPT, BCG and Measles were assessed in the survey for children aged 3 to 36 months in the wereda. Only about 30% of eligible children were found with vaccination cards during the survey time. Vaccination coverage is high for Polio and low for BCG. The reason for high performance in Polio is obviously the result of national campaign under international pressure. Only 5.4 % of the eligible children were fully vaccinated. When this level of achievement is observed across AEZs, it is 2.9 % in kolla and 6.8 % in weina dega

Similar to the whole country, practice of breast-feeding is considerably high in Badawach. For instance, about 88% of the interviewed women reported that they practice breast-feeding, about 81% of the children between 0 to 6 months were exclusively breast-fed. Proportion of exclusive breast-feeding declines starting the age of seventh month.

In the survey, eligible women were asked that whether her child was sick or not in the last two weeks prior to the survey. And they were also asked about the type of disease that attacked her child. Accordingly, considerable proportion of the children aged 5 years or less in the wereda were found experiencing various types of illness within two weeks prior to the survey. However, only 22.6% of the sick children received treatment or

advice in the health institutes. With regard to the age group, relatively higher proportion of children were faced illness in the first and second year of their age. Concerning the types of diseases, fever was found the leading child problem in the wereda followed by diarrhea. Proportion of children reported to have had fever and diarrhea were 34.9% and 20.3% respectively.

Malnutrition can be the result of various interrelated factors that affect the community. Higher level of malnutrition could lead to increased mortality rate in a certain society. According to key informants' opinion, about 77% of the wereda's population are perceived malnourished, 72.1% of children perceived very short by age of five years, and 71.7% of mothers are perceived to be very thin. Whereas, the household survey indicates that 46.4 %, 15.5 % and 48.5 % of Badawacho's children aged 3 to 36 months were stunted, wasted and under weight respectively, and about 26% of women in the age range of 15-49 years were found malnourished in 1992 using the mid upper arm circumference measure.

The above high level of malnutrition obviously indicates that the livelihood status of the inhabitants is deteriorated. There will be no surprise to expect high mortality rate as well as short life expectancy at birth in the wereda. According to the results of household survey, under five mortality rate in Badawacho is about 221 and the life expectancy at birth is 45.4 years in 1992. These rates were about 225 and 44.7 respectively, according to the 1987th National Population and Housing Census.

3.4 Food security and poverty

Food security status of the households is mainly the reflection of their resource base. Accordingly, majority of the households in the wereda were found either temporarily or permanently food insecure. As calculated from the household survey result, the average available calorie from the reported production was only 832 calorie per person per day in 1992. This shows that, only 38 % of the individual's daily energy requirement was satisfied in the wereda, based on FAO's standard recommendation of 2280 calorie per an adult person per day. The result of household survey indicated that about 96 % of the family members in the wereda get less than the recommended daily energy intake. Besides, about 83 % of the households responded that their total annual income and/or production is too small or much too small to satisfy their families' food requirement. Only 0.9 % of the total households responded that their total annual income and/or production is sufficient to satisfy their families' food requirement, whereas, the remaining 16% responded that their total annual income and/or production is barely sufficient to satisfy their families' food requirement.

It is also revealed by the key informants and the participants of community focus group discussions held at the sample PAs of the wereda, that there are specific months during which the majority of the community faces sever food shortage problem in the normal year. A normal year, here, is meant by the community to be a year without significant weather shock. According to the key informants, these months of critical food shortage last from February to July in kolla and from February to June in weina dega. As a result, it can be said that the whole wereda faces critical food shortage problem in the months

from February to July, at which the number of meals per day will be reduced to be only one. It is misfortune that this period of critical food shortage coincides with the time of heavy labor requirement for the farming community in the wereda.

It is widely believed that poor households are the ones to be more vulnerable to disaster during the incidence of hazards like drought and epidemics. Thus, categorizing wealth classes will help to identify the poor and very poor for targeting in cases of disasters. According to the discussion held with the focus group in each of the sampled Pas, size of land holding, number of oxen, number of cattle, size of land with Enset and other perennial crops including Eucalyptus tree, number of pack animals, and the status of housing are the major characteristics used to differentiate various wealth classes in the wereda. The most important indicators including proportion of the community with no or very little size of such possessions are summarized in the following table.

Proportion of the community with no or little possessions of wealth indictors by AEZ - Badawacho(1992)

Level of indicator	AEZ		Wereda Total
	Kolla	Weina dega	
Proportion of HHs land less	5.2	5.8	5.6
Proportion of HHs with land holding of less than or equal to 0.25 hectare.	10.7	27.1	21.6
Proportion of HHs without any livestock	13.8	20.7	18.4
Proportion of HHs without ox	57.2	60.7	59.5
Proportion of HHs without any reported cash income	20.9	18.4	19.2
Proportion of HHs already out of stock during survey time(Feb. 1992)	27.6	72.4	41.5
Proportion of households perceived poor	44.8	39.9	41.5
Proportion of households perceived very poor	22.2	22.5	22.4

Source: KIs and sample households in the sample PAs of the wereda.

3.5. Disaster History and Risk

As defined in the new disaster prevention and preparedness policy of Ethiopia, disaster is the cumulative effect of various hazards. The major types of hazards occurred repeatedly since 1960 in the wereda are drought, epidemics, flooding and water logging and pest infestations. The most frequently mentioned years of disasters, especially for drought and epidemics are 1965,1977, and 1991.

Drought occurred in the years 1965,1977 and 1991 had caused death of both human being and the livestock. The highly affected group by the effect of drought of the above mentioned years were children, pregnant women, mothers, old age group and the poor households in general. Most of these population groups are less mobile so as to cope up with the consequences of drought.

The occurrence of human epidemics were often associated with drought and also ended with the death of considerable number of human being. Small pox, Cholera, Meningitis, Malaria, Typhoid and Diarrhea were the most common types of diseases occurred at epidemic level since the end of 1950s. Some types of diseases such as Malaria, Typhoid and Diarrhea, were identified to had been occurring repeatedly during the mentioned period covering the whole wereda. And also, the epidemic attacks of Small pox and Cholera covered the whole wereda. On the other hand, the occurrence of the Livestock epidemic outbreaks were reported in the years 1955-1957,1965, 1981,1989 and 1991. The major types of diseases occurred at epidemic level were Furto, Sombie, Murata, Karsho and Baha'l Jabo by their local names. These outbreaks of epidemic attacks were ended up with the death of large number of livestock population. This in turn resulted to sharp reduction of livestock products like Milk, Butter and Cheese.

Children, pregnant women and mothers, and old age were the highly affected groups of population. Besides, people settled at flat plains, overcrowded areas, areas with poor infrastructures and essential services like roads and health institutes were also among the highly affected group of population by the epidemic outbreaks.

Flooding and water logging problems as a disaster has been attacked PAs with flat topography. Flooding has been severe to PAs with flat topography along the mouths of big rivers. Whereas, water logging has been more severe to PAs with plain and heavy clay soils. Both were problems occurring during heavy rains. The highly affected are the less mobile group such as children, mothers and old age group of the community residing in the PAs with flat topography.

Crop diseases and pest infestations were reported to have been affecting all parts of the wereda. The attacks of crop pests and diseases have been significantly contributing to the occurrence of famine and poverty. Referring to times of occurrence, crop pests were reported in the years 1975, 1980,1985, 1987 and 1991 in the weina dega and in the years 1983, 1985, 1987, 1990 and 1991 in Kolla parts of the wereda. The discussions with community focus groups revealed that improved seeds supplied by the extension agents were found less resistant to most crop pests and diseases. As to crop diseases, CBD and Alloya, /the type of disease which attacks Enset plant/, that are reported in weina dega part of the wereda.

3.6. Local capacity, Resilience and Coping Strategies

The local capacities that helped the community in preventing the disasters occurred in the past include:

- The existence of local institutions, like Edir, accountable to the community at large, are formed to prevent the consequences of the problems that occurred frequently and affect life in the localities. These institutions were able to mobilize the community members to help the victim families according to their statement of formation.
- The communities' common consensus in preventing the consequences of the occurred disasters through sharing resources, especially, food and shelter, taking responsibility of the activities of preventing the occurred risks and the like.

- The practice of growing drought resistant perennial crops such as enset, banana, sweet potato and the like in the wereda.
- Availability of excess labor among the families to participate on various income-generating activities, especially, during occurrence of risks.
- The considered good culture of planting trees.
- The communities' willingness to contribute cash, free labor, and construction materials such as sand, stone, and wood free of charge when necessary to support the activities of preventing risks and promoting development in the localities.
- Even though they are with low quality service, the physical availability of health institutions. The health institutions are evenly distributed in two hours walking distance among the community of the wereda.
- Good road net work, i.e. the whole wereda is accessible to roads of different grades, asphalt, gravel and feeder roads.
- Good market access

Resilience refers to household's recovering capacity to shocks of disasters. Some households are more resilient and others are less due to various interrelated factors. Household's resilience status partly depends on their copping strategies as well as the degree of effectiveness of the local institutional support. Such issues are briefly summarized based on the qualitative information obtained from the key informants and community focus group discussions held at the sample PAs.

As indicated in the CADs of the sampled PAs, resilience to disasters in general has improved in Kolla or low land, but deteriorated in intermediate high land or weina dega compared to their parents' time. Establishment of more service centers, improved supply of modern agricultural inputs, enhanced soil and water conservation works, improved awareness as well as better access to information, improved reporting system during disasters and strengthened relief and rehabilitation works were mentioned as major reasons for improved resilience to disasters in Kolla parts of Badwacho. Whereas, rapid population growth, diminishing households' land holding size, soil depletion, repeated outbreaks of epidemics and deteriorated supply and quality of food were mentioned to have been the major reasons behind deteriorated resilience to disasters in the intermediate high lands or weina dega.

Regarding resilience to specific types of disasters, the key informants in kolla mostly agreed that resilience to drought and epidemic has improved. But in the intermediate high land /weina dega/, resilience to epidemics has improved and it has deteriorated to drought. The major reasons regarding improved resilience to drought and epidemic by agro- ecological zones are summarized in the following table.

Major Reasons for Deteriorated/Improved Resilience to Drought and Epidemic by AEZ -Badawacho (1992)

AEZ	Type of disaster	Status of Resilience	Reasons Behind for Improvement, Staying the Same or Deterioration
Kolla	Drought	Improved	- Active relief and rehabilitation program. - Ongoing integrated soil and water conservation works. - Better awareness to seek timely help.
	Epidemic	Improved	- Improved access to health services - Better access to education and awareness - Active relief and rehabilitation programs. - Better copping strategies - Better awareness to seek timely help - Better supply of food aid
Intermediate High Land/ weina dega/	Drought	Deteriorated	- Less land resources - Low food production - Less livestock resources - Worse climatic change - Increased poverty in general
	Epidemic	Improved	- Improved access to health services. - Better awareness to seek timely help.

Source: KIs in the sample PAs of the wereda.

Various coping mechanisms were undertaken during and before the occurrence of different types of disasters in the past by the households, community at large and the institutions. Information obtained from the CADs, Key Informants and the households survey results are summarized in the following table. As indicated in the household survey, skipping eating the whole day, renting out own land, and selling household assets are coping strategies mainly practiced when the problem becomes more severe. Except growing drought resistant crops like enset mainly practiced in the intermediate high land all other coping strategies did not show any variation between the two agro-ecological zones.

Coping Strategies Practiced During Disasters at Various Levels by AEZ-Badwacho(1992)

Time	Coping Strategies Practiced		
	By the Households	By the Community	By Institutions
At normal time	- Petty trade - Selling livestock & livestock products - Using modern	- Supporting each other through local self help organization called	- Coordinating soil and water conservation works - Constructing rural

Time	Coping Strategies Practiced		
	By the Households	By the Community	By Institutions
	agricultural inputs - By being member of local self help organization-*Edir* - Growing drought resistant crops - Growing short maturing crops	Edir - Replacing cattle when died at normal time -	roads - Developing and protecting springs - Distributing seedlings - Establishing health institutes - Providing small scale credit services - Providing ox for the very poor
At the beginning of disaster	- Reducing meal frequency and or quantity - Depending on the better of - Household members seeking work within the PA		
At the middle of disaster	- Selling fire- wood, charcoal, dung, etc. - Eating less preferred or foul food - Constructing cut of drains - Household members seeking work outside the PA	- Reporting to the higher government body about the problem in time - Reporting to the higher government body about the problem	- Organizing EGS -
When the problem becomes more severe	- Renting out lands - Selling household assets - Skipping eating the whole day - Borrowing cash and grain from others - Withdrawing children from schools	- Taking patients to the health institutes by carrying on shoulder in group - Contributing cash, grain and labor for disaster victim families -	- Providing relief food aid

Source: The CADs, KIs and Sampled households in sample PAs of the Wereda.

4. Conclusions

4.1. Who are the most vulnerable groups? and where are they?

Majority of the inhabitants in Badawacho are suffering from extreme poverty mainly due to scarcity and depletion of land resources, which in turn is the result of high population pressure. The worst feature of poverty is food insecurity and food insecurity that resulting from poverty is usually chronic. According to our multilevel analysis, majority of the inhabitants of the wereda are either temporarily or permanently food insecure mainly due to the same reason mentioned above. February to July in the low land or Kolla and February to June in the intermediate high land or weina dega were identified to be the months of critical food shortage even in a normal year in Badawacho. Though it can easily be shocked by the occurrence of drought, kolla part of the wereda was found relatively better in terms of food security. This is due to the fact that land holding size of the households is considerably larger in kolla than that of weina dega in one hand and increased productivity of cereals following the new extension package that favored more the kolla inhabitants dominantly with cereal culture on the other hand.

Besides this state of livelihood, disasters such as drought, epidemic, flooding and water logging and pest infestation are identified to have been repeatedly affecting the inhabitants in Badawacho. The households' resilience to disasters has improved in Kolla or low land but deteriorated in the intermediate high land or weina dega due to various reasons. Children, pregnant women, mothers, and old age group were highly affected by the occurrence of the above hazards. The ultimate effect of these hazards is more vulnerability of the community to disaster. Groups of population who were believed to be more vulnerable to disaster as a result of the major hazards occurred in the wereda are summarized in the following table.

Types of households more vulnerable to major types of disasters- Badawacho(1992).

Type of Hazard	Type of Households Becoming More Vulnerable
Drought/Famine	- Polygamous households - Households with less knowledge about economic use of resources - The poor and very poor - Households depending only on agriculture - The kolla inhabitants mainly depending on cereals - Households with poor land cover who are mainly located in kolla part - Households with large family size - Households whose heads addicted to alcohol
Epidemic	- Households living near big rivers - The poor and very poor - Households using drinking water from unclean sources - Households with poor personal and environmental hygiene
Water Logging	- Households residing on flat plains with heavy clay soils - Households with shortage of labor, implements and cash to construct

Type of Hazard	Type of Households Becoming More Vulnerable
	physical structures that could improve the drainage condition

Source: CADs held in the sample PAs of the wereda.

The identified types of households to have been most vulnerable to drought and pest infestation are found in the wereda scattered else where. And also the house holds who are identified to have been most vulnerable to epidemic are those living in flat plains, flooding and water logging risks stricken areas and congested settlements in the wereda. Where as, the households identified to have been most vulnerable to flooding and water logging problems are those living in PAs with flat topography and heavy clay soils. About 7 PAs in weina dega AEZ of the wereda have continuously been affected every year by this risk during heavy rains since 1983.

5. Remarks and Recommendations for Future Interventions

It is not easy to strongly recommend solutions for quite large number of interrelated problems identified through this multi level analysis. However, we proposed some suggestions depending on the identified problems, suggestions made by the local community and the local reality to practice recommended alternatives. Thus, our recommendations, briefly described in this section are subject for further improvement accordingly.

5.1 Family Planning

For population pressure was found among the major factors for exposing the inhabitants more vulnerable to various disasters, activities should be carried out so as to slow the current rapid population growth in one hand and feed the already extremely dense population in the area on the other hand. Even though most of the inhabitants still need more children despite all the hardship, local and external organization should work hard to influence the inhabitants accept and pursue family planning measures. In fact, there are considerable proportion of households in favour of family planning if birth control methods with lesser side effects are made available. Thus, family planning education supported by the provision of sound contraceptives is must so as to cope up with population explosion and resource scarcity in Badawacho.

5.2 Non-farm Activities and Credit Facilities

Family planning could be taken as a long- term alternative to population pressure. Other measures should be taken as an immediate alternative so as to improve communities' livelihood. Promoting and expanding chances of non- farm activities is not to be overlooked in this regard especially for the newly formed young families with no or little land for cultivation. The locally existing skills like wood- work, carpentry, poetry, etc. should be improved through training and credit facilities. People of similar interest and skill can be organized into small cooperatives taking their social links into account so as to provide both credit and training in a more organized and workable manner.

5.3 Agricultural Extension

The new extension program in Badawacho was found promissing since it was able to increase productivity of cereals by considerable amount. However, it should further be strengthened by incorporating lessons learned from experiences of the recent past and should not be limited to extension of cereals only. Extension programs like livestock and natural resource management should also be given emphasis if sustainable development is to be achieved. For the falling prices of grains and ever increasing price of agricultural inputs were found discouraging the farmers from participation in the new extension program, both the government and NGOs should think about how to improve price for the produce so that their benefit can exceed costs of production.

Despite large livestock population, there is extreme shortage of both veterinary clinic and personnel. Thus, attention should also be given so as to improve physical availability of vet clinics and personnel.

Development agents should not be burdened by additional responsibilities other than the extension work so as to get sufficient time to assist farmers and establish smooth relationship with the agricultural community. In-service training should continuously be arranged for DAs in order to make their involvement in the agricultural development more fruitful. They should also be trained in a way that they can keep agricultural data properly so as to base the extension works on reliable information.

5.4 Nutrition

The observed high level of malnourishment in the area can be the result of the identified extreme food insecurity in one hand and poor utilization of the available food. Prevalence of infectious diseases can also have strong interaction with especially child malnutrition. Thus, efforts should be made so as to improve food supply status in one hand and proper utilization of the already available food in the households. In fact, fighting the infectious diseases should not be undermined since interaction of malnutrition and prevalence of diseases are well known phenomena.

5.5 Research and Development

Lessons learned from the already developed countries indicate that development efforts must be supported by targeted and continuous research works if meaningful change is to be brought on the livelihood of the community. For instance, pests and diseases on some drought resistant crops like *enset* are disturbing the most important economic base of the community, but no sound pest controlling mechanisms are employed. The major foreign currency source, coffee, is still suffering from CBD. Yields per unit area for most crops are still very low compared to the achievements worldwide. The livestock are still mainly local breeds with relatively low yield. Thus, various organizations and government offices involved in agricultural activities should form strong linkage with the Agricultural Research Institutes in the country so as to come up with sound pest controlling mechanisms in particular and further improve agricultural productivity in general.

5.6 Basic Services

Provision of quality basic education is believed to reduce population pressure on land resources by creating chances of non- farm jobs. Thus, factors identified to deteriorate quality of formal education in the wereda should be curbed. Absence of adult literacy program was found contributing for the increasing illiteracy while lack of kindergartens and child literacy places in most rural areas is making the children delay beginning of their primary education. This should also be given attention.

Most of the health institutes in Badawacho were not supplied with trained health personnel and necessary medical equipment at the time of this survey. Since physical availability of health institute by itself does not necessarily guarantee communities' access to health services, the available health institutes should be supplied with trained health personnel and relevant medical equipment if proper service is to be rendered.

Even though there is progress over time with regard to the supply of potable water, over two-third of Badawacho's inhabitants still do not have access to potable water. For lack of access to potable water was found closely related with the prevalence of most water born diseases, enhancing supply of clean water should be among the priority areas in the wereda.

Our study indicated a big difference between performance of polio and other vaccinations. This shows that performance can be improved for other vaccinations like that of polio if similar effort is made. Since the coverage is still low for all immunization vaccinations in the wereda except for polio, further effort should be made in this regard.

5.7 Natural Resource Management

It is obvious for every body that agricultural economy heavily depends on the natural resources. Thus, enhancing conservation of soils, water and land cover is among the priority areas to obtain sustainable yield from the land resources. For physical structures could compete for the already scarce land resources, biological conservation methods like agro-forestry, inter cropping, crop rotation and relay cropping are to be given emphasis in Badawacho. In fact, physical structures like cut-of drains in waterlogged areas like Jarso plain and soil bands in steep slopes are not to be missed. In either of the cases, professional assistance is must to be fruitful with any conservation activity.

5.8 Resettlement and Out-Migration

Population pressure is not a problem throughout the country due to uneven distribution from place to place. For instance, according to the 1987th Statistical Abstract of Ethiopia, population density ranged from 7 persons per square kilometer in Gambela to 92 persons per square kilometer in the Southern Region with lack of data for Afar and Somale Region. Even in the Southern Region, population density ranged from about 3 persons per square kilometer in Selamago wereda of South Omo Zone to about 727 persons per square kilometer in Wenago Wereda of Gedeo Zone. Though the carrying capacity differs from place to place, the above data show that there are areas extremely under populated or sparsely populated despite some pockets extremely overpopulated.

Therefore, population resettlement programs should carefully be designed so as to cope up with the population pressure observed in Badawacho. By careful design we mean not to repeat similar mistakes as that of the Derg regime where resettles were not given enough protection from the attack of the former settlers besides inadequate study before the program. Rather, it can be done by incorporating lessons learned from some of the successful resettlement programs such as the resettlement of the Kembata People around Gibe Valley or Tedele area. Besides arranging sound resettlement programs, the policy environment should encourage population mobility from place to place either temporarily or permanently within the country.

5.9 Strengthening the Data Base

Interventions can be more fruitful if planning for intervention basis reliable data. But, the data- base of offices both at zone and wereda level is very weak as we realized during our survey. Even some data are in the hands of individual experts with possibility of disappearing following their transfer. Thus, care should be taken to have reliable data at these levels. Regional offices with better human resource capacity should assist zones and weredas by providing relevant training and developing proper formats in this regard.