Climate Change Vulnerability

The Case of Naroda Industrial Estate

Socio-economic Vulnerability and Planning strategy

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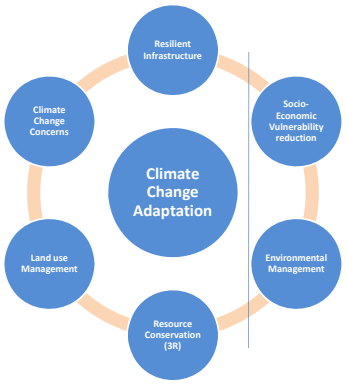
Climate Change Adaptation – A framework



Contents of the Presentation

- Objective of the Study
- Detailed methodology and approaches
- Exiting Scenario of Industries at NIE
- Socio-Economic Vulnerability of Workers, and
- Adaptation and Planning Strategies for CC

Objective

- To examine existing social and economic characteristics and community resilience
- Assess vulnerability of Industrial Community
- To suggest and propose planning solution by major stakeholders

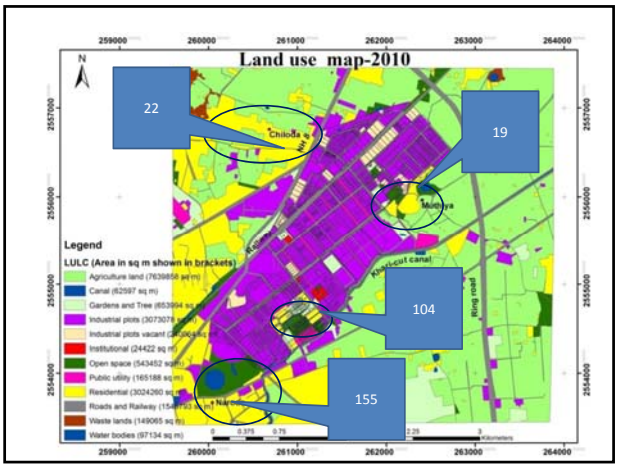
Approach and methodology

- Reconnaissance Survey &photo documentation
- Stakeholders' consultation
- Questionnaire based primary survey of 300 HH of Industrial Community
  - Residents of NIE
  - Workers staying in and around NIE villages
  - Industry owners
  - Others (informal activity workers)

Selection of Survey locations and HH

Locations in and around NIE

1. Naroda Village
2. NIE Estate Complex (Residential)
3. Nana Chiloda
4. Muthiya Gam



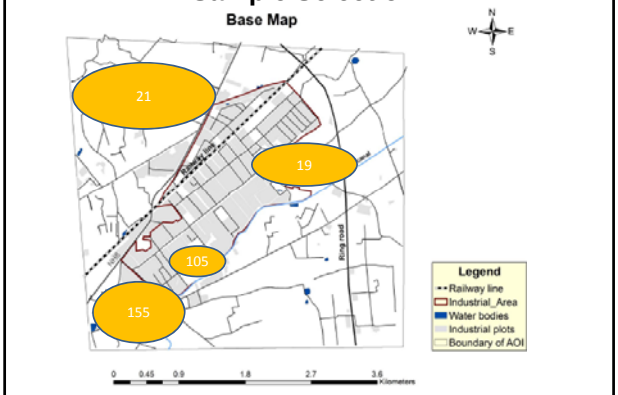
Sampling Details for the Study Area - NIE

- Total Industrial Community HH- 3000
- Total HH selected 300 (10%)
- Proportionate Sampling Methods applied

Target Groups (HH)

		Frequency	Percent
1	Resident	86.00	28.67
2	Worker	201.00	67.00
3	Industrialist	2.00	0.67
4	others	5.00	1.67
5	no reply	6.00	2.00
6	Total	300.00	100.00

Sample Selection



Exiting Scenario of Industries- NIE Profile

- Socio-economic assessment
- Access to basic amenities
- Physical Infrastructure –Services and Quality
- Status of social infrastructure and quality
- Energy use –levels and pattern at HH level

Socio-economic profile

Demographic Characteristics

- 55 % of the respondents are below 40 years of Age (implies relatively younger workforce)
- 90% of them are below 50 years of age
- 93 % are male (280)male workers dominated industrial workforce)
- 93 % are married and living with their family
- Average Family size of 5 persons

Social Vulnerability

Caste Groups		
	Frequency	Percent
ST	12.00	4.00
SC	54.00	18.00
OBC	141.00	47.00
General	88.00	29.33
No reply	5.00	1.67
Total	300.00	100.00

Educational status

	Frequency	Percent
Illiterate	45.00	15.00
literate	26.00	8.67
Primary	57.00	19.00
Secondary	125.00	41.67
Higher Secondary	41.00	13.67
Others	4.00	1.33
No reply	2.00	0.67
Total	300.00	100.00

39 % are Skilled and 60 % are unskilled workers

Employment Status of workers

Employment Status	Frequency	Percent
Casual	54.00	18.00
Regular	141.00	47.00
Daily wage	75.00	25.00
Others	19.00	6.00
No reply	11.00	3.67
Total	300.00	100.00

Monthly Income

	Up to Rs. 5000	Rs. 5001-10,000	Rs. 11,000 to 20,000	More than Rs. 20,000	No reply	Total	**Avg. H.H Income (in Rs)**
Permanent	18.06	70.14	8.33	1.39	2.08	144	**7477**
Transient	39.39	51.52	7.58	0.76	0.76	132	**6450**
others	22.73	59.09	13.64		4.55	22	**7504**
Total	28.00	61.00	8.33	1.00	1.67	300	**5357**

Types of Skills of the workers

Type of work-unskilled		Frequency	Percent
Valid	Loading/unloading	48.00	16.00
	Cleaner	47.00	15.67
	Tester	5.00	1.67
	others	5.00	1.67
	Not applicable	209.00	69.67
	Total	300.00	100.00

Types	Percentage
Skilled	30
Unskilled	70

Local Vs Migrant Workers

Gujarat	280.00	93.33
Rajasthan	10.00	3.33
Orissa	3.00	1.00
UP	6.00	2.00
Tamil Nadu	1.00	0.33
	300.00	100.00

Vulnerable Family Members

Any handicap in the family			
		Frequency	Percent
	yes	9.00	3.00
	no	291.00	97.00
	Total	300.00	100.00

Access to basic amenities

Housing

Ownership of house			
		Frequency	Percent
Valid	own	278.00	92.67
	rent	22.00	7.33
	Total	300.00	100.00
Type of house			
		Frequency	Percent
Valid	Pakka	175.00	58.33
	Kachcha	32.00	10.67
	Kachccha-pakka	93.00	31.00
	Total	300.00	100.00

•87% houses are less then 50 years old and 41% are 21 year old
•Housing prices ranges from 5000 Rs to 14 lakh Rs

Drinking water facility

Individual tap		
	Frequency	Percent
YES	272.00	90.67
NO	28.00	9.33
	300.00	100.00

•More then 90% has individual tap water
•93% people are satisfied with water quantity available and average availability is 40 LPCD (approximate)
•41% Households reported bad water quality problem in terms of dirty color, it found to be a persistent problem through out the year

Sanitation and solid waste management

•Only 63% households access to individual household toilet

• 60% households use sock pit , which indicate poor sanitation facility for workers

•94% households are using private and public dustbins for garbage collection

Water drainage facility available

Frequency	Percent
236.00	78.67
64.00	21.33
300.00	100.00

Among 78% households , 33.33% households reported poor condition of storm water drainage , which leads to water logging, flooding in heavy rains

Education facilities for workers' children

50% Childers are going to private schools and onhly 52% among them have school facility within 2 km vicinity.

Place of residence and working area

Industries-near by house

	Frequency	Percent
YES	190.00	63.33
NO.	110.00	36.67
	300.00	100.00

Mode of commuting

use of vehicle		
	Frequency	Percent
own	236.00	78.67
public	59.00	19.67
no reply	5.00	1.67
Total	300.00	100.00

25% people are using bike and 38% are using bicycle
Average distance travelled by all workers daily in 2 KM. Maximum distance reported is 5 KM

Energy Use at HH Level

Gas-LPG	Coal	Firewood	Kerosene	Others (Cow dung-Cake etc)
70.33%	3.00%	33.67%	53.00%	2.33%

Water logging and flooding

frequent heavy flooding	water stays on the street more then 5 days.	can not go to work	closer of factory because of flood	
95%	64%	10%	42%	15.33%

Food glossary destroyed because of flooding	no light-flooding	problem to get drinking water-flooding	cleanliness problem in flooding	disease has been increased in flooding
15.33%	55%	28%	62.33	94%

In case of extreme events there income gets effected

Workers' Response to Hazards

•95% respondents are NOT aware of any safe place in case of any hazards,
•90% among them shout in case of emergency and only 20% uses mobile

Health Problems after flooding

Malaria	Jaundice	Stomach pain	Asthma	Pneumonia	Breathing related	skin related	Cancer
86%	47%	34%	47%	27%	80%	78%	22%

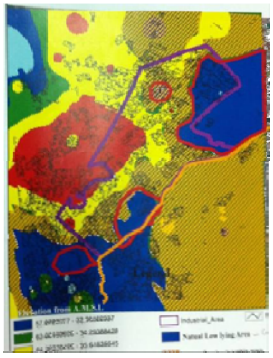
•Only 4% workers have used factory clinic ,17% go to government clinic and 83% have gone for private clinic
•51% workers gets primary facility at work place only , 42% among them are not satisfied with the quality of treatment

Planning Strategies

- Provision of basic and essential services
- Housing and shelters
- Social infrastructure and services
- Livelihood



FLOOD PRONE AREA AND HOUSING SETTLEMETS




Social Vulnerability and Climate Change Adaptation Strategies

Planning and Design Solution

- Spatial planning
- Flood location-accessibility
- Health, education facilities ne
- Access to transportation and Climate Change Hazard
- Provisioning of basic services
  - Drinking water
  - Health facilities
- Working duration/ hours
- 2 shifts to reduced to 1
- lack of leisure and entertainment- Open Space and children's play ground to be improved
- Food/lunch-eating places at work place- MIE based canteen/ hospitality/quality restaurants (subsidized) by NIE (as CSR policy)




SECTOR-1: HOUSEHOLD VULNERABILITY & CHARACTERISTICS

Existing scenario

- Large family size, all staying with the family/higher dependency ratio
- More young people 55% under 40 years age
- Majority of them are local labor

Planning strategy and solutions

- Improvement if basic amenities as they are local residents

SECTOR-2 : ACCESS TO BASIC GOODS/ AMENITIES- HOUSING CHARACTERISTICS

Results & scenario

- Poor housing, lack of basic services like wate
- Rented house4hold ownership is an issues
- Majority of them are semi-pacca

Planning strategy and solutions

- Access to credit facility for housing loans as means of guarantee
- Repair and maintenance

SECTION-2 BASIC INFRASTRUCTURE SERVICES & QUALITY

Results

- Road- access is ok within the NIE, kaccha road are also
- Water (drinking)- access is assured, adequacy and quality
- Sanitation- needs augmentation as only 69% has access
- Storm water drainage-Aggravates during floods/ heavy ra
- Storm water and sewage is mixed (problem of CETP)
- Poor SWM within NIE

Planning strategy and solutions

- Augmentation of basic services
- drinking water, toilet facilities, SWM
- Separate storm water and sewage lines

SECTOR-3: SOCIAL INFRASTRUCTURE SERVICES AND QUALITY

Results

- Health facilities- no guarantee
  - Heavy dependency on private sector
  - medical facility provided at work place, **but poorly**
- Education
  - Govt. school - 48%
  - Private schools- 52%
  - 72 % satisfied with school facility
- Entertainment
  - Lack of garden/playground
  - Use public place like roads etc/open plots for playground

SECTION-3 PLANNING STRATEGY AND SOLUTIONS

Health

- Health security and safety measures to be enhanced at association level
- Medical facilities of NIE- To Improve and ensure better accessibility
- Health insurances/ Medi-claims, group insurances at unit level

Education

- Access to schooling for children- school bus services
- Child welfare schemes by NIE

Play/entertainment

- One multiplex at NIE (based on cooperatives)
- Play grounds to be improved wherever possible

SECTION-4 ENERGY USE AT HOUSEHOLD LEVELS

Results

- Traditional fuel use for cooking and so indoor pollution expec
- Poor access to LPG as it is unaffordable to majority of worker
- Kerosene used for domestic lighting as well
- Household suffers from power cuts
- Household uses electrical or electronic appliances like T.V., fridge etc
- Domestic lighting- low use of CFC bulbs as it is expensive and amounts higher energy consumption

Planning strategy and solution

- Promotion of LPG for cooking
- Awareness to be created to use CFL bulbs (subsidized for register/ regular workers)
- Promotion of solar and wind energy to continue in NIE

SECTOR-5 CAPABILITIES AGAINST HAZARDS

Results

- 93% do not know about the safety place in NIE in case of emergency
- Access to news about hazard is in place – TV, radio (access to mobile is less)
- Major hazards-flood/water logging, fire, earthquake, extreme summer
- Repeated damages to assets
- No insurance and Medi-claim facility to the workers
- Restricted supply of household grocery
- Unable to reach to work place
- Closer of factory in some cases
- Have no wage (income during the crises gets reduced)

Planning strategy

- Safety siren/ local communication network to inform workers in case of hazards
- Awareness about safest place in NIE
- Identification of safe spots and place for excavation in case of emergency

Lets Work Together for our future Generation