

Sustainable Development of Nizampatnam Rurban - a Model Study

P. Sri Poojitha, K. Rajasekhara Reddy

Abstract: *Urbanisation is taking place at a rapid phase in India due to employment opportunities, education, entertainment, comforts, transportation, economic activities and better amenities. Both central and state government are giving more thrust for augmenting infrastructure in urban areas and less importance is given to rural areas. Around 60% of the population in India is living in rural areas and depending on agriculture and allied activities. As agriculture has become non-remunerative people from rural areas are migrating to urban areas in search of job. Migration of rural people to urban area can be reduced only when agriculture becomes sustainable remunerative and infrastructure and amenities are developed on par with urban areas. Concept of rurban is introduced with an objective of providing amenities on par with urban in rural areas. This paper aims at study of existing infrastructure in Nizampatnam. Collecting the expectations of the stakeholders, identifying the gap between the existing infrastructure and expectations, come up with an infrastructure model for the study area. Existing infrastructure in the study area is collected, a survey is carried out among the stakeholders to understand their needs and expectations and gap in infrastructure is identified. Also identified the schemes of state and central government under rurban mission and various other schemes and evolved and the modes of finance. Appropriate infrastructure for sustainable second green revolution is identified and presented.*

Index terms: *Rural infrastructure, Rurban, Schemes, sources of funds.*

I. INTRODUCTION

In India on an average 63% of the total population is living in villages as per 2011 census. But now a days the migration of people from the rural to urban areas is increasing on a large scale due to unemployment, inadequate water supply, sanitary conditions lack of proper health care facilities, educational facilities, entertainment, communications, agriculture has become non-remunerative and the due to employment opportunities in urban areas. As per 2011 census about 2.3 crores population is migrated from villages to town and 5 crores population is migrated from one village to another village. Hence, there is a need to focus on villages to improve income from the agriculture and allied activities the quality of life of rural people and to reduce the migration from the infrastructure, facilities and services to the villagers on par with urban areas. There are several individual sector schemes to provide such facilities to rural people, but the implementation of such schemes is not properly carried out due to various reasons.

The development of large villages into urban areas on non-farm basis development is converted as urban areas and

the economic and socio-cultural aspects for the development of rural areas represents rurban areas [1]. The aims of rurban mission and its optimistic way of approach, focusing on smart villages and regional development are the only ways to improve the rural areas in India [2]. The development of rural areas through smart village system, information technology and socio-economic development and concluded that the development of villages is boosted by extending the concept of smart villages which also improve the socio-economic development of the nation [3]. The water supply and sanitary conditions for the peri urban and rurban areas can be carried out by using GIS and ground survey [4]. Environmental sustainability, smart village concept of the village differentiates the rurban clusters from the urban areas [5]. The development of villages greatly increases the socio-economic development of the nation [6]. According to shyama prasad Mukherji there are two types of clusters which is classified into tribal and non-tribal clusters [7]. A new mission called National Rurban Mission (D.O. No. J-12011/01/2016-RURBAN) (pt.1) is launched by the government of India to provide such urban infrastructure, facilities and services to villages and village clusters there by initiating the development of rural areas [8]. Provision of Urban amenities to the Rural Areas (PURA-2004) is another scheme to provide allied facilities to the rural areas Government of India is also taking the initiative to provide the funding for the development of village clusters through various schemes and programmes [9]. Farmer S. Raju who lives in Ananthapur district has thrown away about 2 tonnes of tomato after realized that he won't get the transportation charges even if he sells it in the market [10]. In 2018 farmers burnt chillies without even plunk from the fields in Andhra Pradesh and Telangana states due to crash of prices of chilli [11].

As per the statistics of National crime Records Bureau there are 160 in 2014, 516 in 2015, 804 in 2016 farmers committed suicides due to debit trap [12].

The area around the Nizampatnam, Guntur district, Andhra Pradesh is chosen as study area. Most of the study area is falling along the coast of Bay of Bengal. Nizampatnam Mandal has a population of 59,343 while the main source of income for the Nizampatnam people are fishing, aqua fields and agriculture. The Mandal plays a major role in education for the rural students of the nearby villages. Location map of Nizampatnam Mandal is given in Fig.1

Revised Manuscript Received on April 09, 2019.

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Fig.1- Location map of Nizampatnam Mandal

II. RESEARCH SIGNIFICANCE

Both the state and central government are focusing on providing infrastructure and improving amenities in urban areas only. Agriculture is the main sources of income in rural areas and now a days it has become non-remunerative. Fisher men are not able to get sufficient quantity of fish due to various reasons. Aqua culture farmers, fisher men and agricultural farmers are getting debit trapped due to various reasons. On the other hand, no proper quality primary education, higher educational facilities, health care, employment opportunities due to which rural people are migrating or thinking of migrating to urban areas in search of employment, better education facilities and other amenities. There is a need to understand the infrastructure requirements and expectations of the rural people for improving their quality of life in all aspects on par with urban people and to bring sustainable development. The objective of the present investigation is to study the existing infrastructure in the Nizampatnam area and to collect the expectations of stakeholders by carrying out questionnaire survey and identify the gaps as well as to prepare the estimation of identified infrastructure in rural areas and propose a suitable model for Nizampatnam Rurban area.

III. METHODOLOGY

Literature review is carried out, existing infrastructure is collected by visiting various concerned offices. Stakeholders are identified, questionnaire survey is carried to understand the requirement and expectations of various identified stakeholders. The gap between the existing infrastructure and expectations of the stakeholder is identified. Various schemes offered by govt. of India and govt. of Andhra Pradesh for improving the infrastructure and augmenting the facilities are identified and mapped with the infrastructure to be provided, cost required for fulfilling the gap in infrastructure and budget involved is estimated and infrastructure model for sustainable development is proposed.

Detailed methodology adopted in the present study is given in Fig. 2

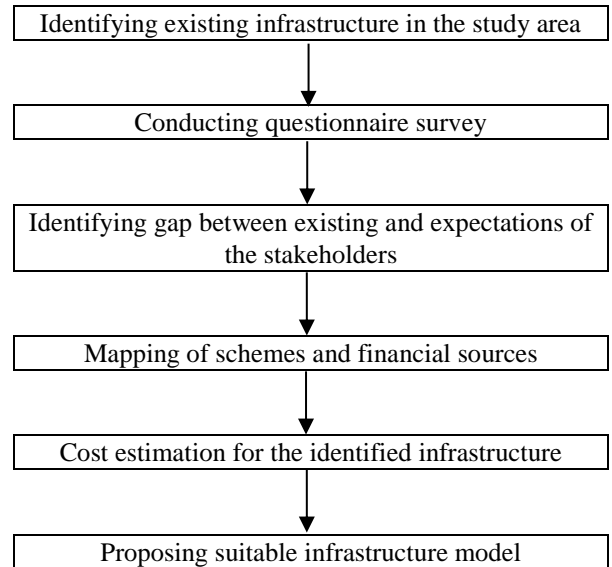
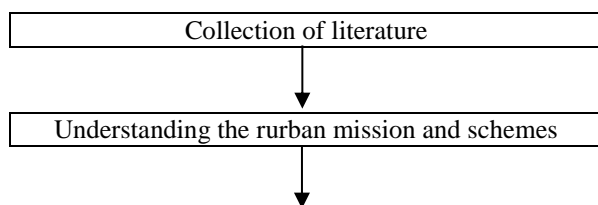


Fig. 2 - Flow chart of methodology adopted

IV. RESULTS AND DISCUSSION

Existing infrastructure is collected by visiting concerned offices and stakeholders in study area.

A. Existing Infrastructure

Hospital: 30bedded capacity hospital.

Fishing harbour: 60 boats capacity harbour, at present 200 mechanised boats with INCOIS information receiving facility and 400 fibre boats are in operation, boat making facility, boat repair facility are available

Aqua farming: 300 hectares area with aerator and lighting facility, subsidized power supply, irrigation water supply, bores, aqua feed shop.

Farming: irrigation waters supply, bores, primary processing (rice mills).

Schools: schools – 20no, junior colleges – 2no.

Civil amenities: Supply of salty water, LPG gas distribution facility, street lights, proper road network, septic tanks, fuel filling stations, community shelter, cyclone shelter, wash rooms, pakka houses for limited people with toilet facility and power supply.

B. Expectations of Stakeholders

The lists of the stakeholders are identified for carrying questionnaire survey. The stakeholders are agricultural farmers, aqua farmers, agricultural labour, aqua labour, fisher men, home makers, aged persons, students and boat owners which covers all the sectors in the Nizampatnam.

The questionnaire for these categories of people is prepared separately to identify their needs and infrastructure required for their respective sectors. By compiling the results of questionnaire survey, the infrastructure and services required for the sustainable development of Nizampatnam rurban are identified and presented in table 1.



Table-1 Expectations of stakeholders

Sector	Infrastructure identified
Farmers	Individual storage facility (minimum 10MT capacity), bulk storage facility (3000MT), bores, better amenities at village level market days, sales outlet, better establishment of road network, power supply for fields, value addition, forming farmers producing organizations (FPO), advice on crop selection and agricultural produce that can be sold locally, exposure visit to model or progressive farmers farms, Tractors, sowing, trans plantation and harvesting machinery
Agricultural labour	Wages as per labour acts
Fisherman	Improving the boat making facility, boat repair facility, compensation for boats in case of any damage, first aid in all boats, conducting medical camps, expanding fishing harbour facility to 400 boats, drying yard facility for fishes, storage facility, integrated cold chain facility for fishes, Alternative employment during fishing holiday
Home maker	Quality drinking water facility, drainage facility, upgraded facilities in Nizampatnam hospital, primary health centre in all villages, uninterrupted power supply, strengthening Dwakra groups, strengthening Anganwadi, market support for home-made foods such as pickles, sweets and spices and

	garments, establishing markets similar to rythu bazar or market days covering all the villages
Aqua labour	Personal Protective equipment, first aid and conduction of medical camp, minimum facilities such as drinking water, alternative employment when there is no work in aqua farms.
Aqua farmers	Integrated cold chain facility which include 4000tonnes capacity cold storage, ice plant manufacturing facility, packing facility, weighing, freezer van, access to extension service officer, better road connectivity, training on good practices, exposure visits to successful farms, training to get crop with acceptable level of antibiotics, supply of kits for water quality inspection, exposure to cage culture, recycled aquaponics system (RAS), subsidised solar units to meet the power requirements of aerators, pumps and motors and others, quality power supply.
Students	Improvement in drinking water facility, washrooms, playground, labs, sports tools, site visits, drainage facility, library, hostels, building repair, institutes, Mid-day meals scheme with nutritious and hygiene, improving the computer facilities
Aged persons	Park, improvement of grave yards, library, generic medical store, pension for all eligible aged persons

C. Gap Between Existing and Required Infrastructure

The gap between existing infrastructure and expectations of the stakeholders is identified and presented in table 2.

Table 2 Gap between the existing infrastructure and expectations of stakeholders

Infrastructure	Existing infrastructure	Expectations of the stakeholders	Gap between the existing and expectations of the stakeholders
Bulk storage facility	0 no.	3000MT	3000MT
Individual storage facility	Farmer level (minimum 10MT capacity)	Separate godowns (10MT-30MT capacity)	10MT-30MT capacity
Bores	Partially available in all villages	Any other mode of water sources	Any other mode of water sources
Power supply for fields	Available for aqua fields	Quality power supply	Quality power supply
Tractors, sowing, trans plantation and harvesting machinery	120 no. of tractors, no custom hiring facility, limited facility for sowing and harvesting, no transplantation facility	Develop minimum 8 custom hiring facilities for Tractors, sowing, trans plantation and harvesting machinery and other agriculture machinery tools and accessories	Develop minimum 8 custom hiring facilities for Tractors, sowing, trans plantation and harvesting machinery and other agriculture machinery tools and accessories
Sales outlet for agri produce	Nil	1 no. in each village and at least 5 in Nizampatnam	1 no. in each village and at least 5 in Nizampatnam
Integrated cold chain for aqua culture farmers	0 no.	4000 tonnes capacity cold storage, ice plant manufacturing facility, packing facility, weighing, freezer van	4000 tonnes capacity cold storage, ice plant manufacturing facility, packing facility, weighing, freezer van
Road network to farms and aqua fields	Kaccha roads/cart track	Formation of pakka roads for transportation of farm input and farm output, overlaying of roads	Formation of pakka roads for transportation of farm input and farm output, overlaying of roads
Boat making facility, boat repair facility	3acres land, basic facilities are available	To strengthen with all facilities	To strengthen with all facilities
Extension of harbour capacity	60 boats capacity	400 boats capacity	340 boats capacity
Drying yard	Nil	10 acres land with 15000sq.m of area for drying	10 acres land with 15000sq.m of area for drying
Drinking water facility	Partial in 4 villages no facility in remaining villages	Expecting protected water supply to all the villages	Complete protected water supply system for all the villages
Drainage facility	Nil	Drainage system in all villages	Drainage system in all villages
Toilet facility	90% of houses are having toilet facility	Rest of the 10% houses required toilet facility, public toilets in Nizampatnam to be provided at 5 location	Rest of the 10% houses required toilet facility, public toilets in Nizampatnam to be provided at 5 location
Hospitals	1 no. of 30 bedded capacity	7 primary health centres, improving the facilities in existing hospital	7 primary health centres, improving the facilities in existing hospital
Schools	20 no., Toilets (2 no. capacity)	Improvement of all amenities in schools (Minimum of 5 for boys and 5 for girls to be provided in all the schools and colleges), English medium instructions in all the schools	Improvement of all amenities in schools (Minimum of 5 for boys and 5 for girls to be provided in all the schools and colleges), English medium instructions in all the schools
Degree colleges/ professional institutions	2 no. junior colleges	1degree college 1 ITI	1degree college 1 ITI
Library, playground, labs, sports tools, hostel	Available with very limited facilities	All the amenities to be improved	All the amenities to be improved
Road network	Flexible pavements (80km)	Repairing of damaged roads with proper shoulders, neem plantation along the roads and converting cart tracks into flexible pavements	Repairing of damaged roads with proper shoulders, neem plantation along the roads and converting cart tracks into flexible pavements
Park	Nil	Park with minimum amenities	Park with minimum amenities

D. Mapping of Schemes and Cost Estimation for the Identified Infrastructure

The various schemes offered by both the Andhra Pradesh and central governments that are best suited for the

identified infrastructure are mapped. Mapping of schemes available with infrastructure to be created and cost estimation is presented in table 3.

Table 3 Cost estimation for the identified infrastructure and suitable schemes

Type of infrastructure	Capacity required	Total cost	Schemes mapped	Funds available from scheme	Funds to be generated
Individual Storage Facility	20 MT	G.I sheet with trusses, 8m raising floor, cost of shed = Rs.4000 per m ² assuming that we can accommodate 2.1MT per m ² area and 2 categories / types of grains	Rural Godown Scheme Gramin Bhandaran Yojana	25% subsidy of the cost of shed and amenities is offered	75% of the cost to be bare by beneficiaries Access to banks to be improved for beneficiaries
Bulk Storage facility	3000MT	Cost of Land= Rs. 50lakhs Cost of shed = Rs.60lakhs Other amenities=1lakh Total cost = 111 lakhs	Godown and Warehouse Creation Rural Godown Scheme	25% subsidy of the cost of shed and amenities is offered capital cost	25 % of total cost
Bores	Available in most of the areas	Wells to be dug to a depth of 20m	No related schemes available	None	Total cost for digging of bores is bare by beneficiaries
Tractors, plowing, sowing, transplantation and harvesting machinery	50 no. no custom hiring facility for transplantation, plowing and harvesting	Tractor= 2lakhs to 10lakhs depending on HP, custom hiring facility comprising of Sowing, transplantation and harvesting machinery, sprayers = (50lakhs approximately)	State agricultural department	For small capacity tractors 50% subsidy is offered, for FPO's subsidy is offered by NABARD and state agriculture department	Balance cost to be bare by beneficiaries, entrepreneurs are to be identified and facilitated for loans from banks
Road Network	Existing roads to be repaired, 80 km of cart track to be converted into flexible metal road	50lakhs/km for conversion	Pradhan Mantri Gram Sadak Yojana Bharat Nirman	100% is funded by the govt.	Nil
Uninterrupted Power Supply,	Quality of power supply is poor	Power supply to be made uninterrupted with scheduled maintenance	KUSUM Scheme	Not considered	Not considered
Drinking water supply (tank)	Present salty water is being supplied with limited quantity	Portable water of required quantity to be supplied	Accelerated rural water supply scheme	100%ncost to be bare by govt.	Nil
Sales Outlets	10 shops	Lease	No related schemes available	Entrepreneurs to be developed with access to loans	Entrepreneurs to be developed with access to loans
Extension of Harbour	340 boats	A proposal of Rs.300 crores for extending harbour is submitted by fisheries department	No related schemes available	Total cost is bare by government	Nil
Boat making and repair facility	Land is available but the same is to be developed and the shed is to be extended, additional machinery to be added	150lakhs	No related schemes	Loans to be provided for development to the entrepreneurs	100% cost to be bare by the entrepreneur

Ice Plant	500blocks capacity	Land=20lakhs Structure=20lakhs Machinery=40lakhs Miscellaneous=10 lakhs	No related schemes available	Entrepreneur to be developed and loans to be arranged	100% cost to be bare by entrepreneur
Integrated Cold chain facilities	Cold storage with ice plant, packing facility, weighing facility, freezer van, outlets with controlled atmosphere	Land cost (2acres) = 80lakhs Sheds (1200m ²) = 48lakhs Machinery and cooling chambers=200lakhs Freezer van (5MT) = 20lakhs Miscellaneous = 4lakhs Total cost = 352lakhs	Integrated Cold Chain Scheme of Ministry of food processing industries	75% capital investment by government	25% of capital cost
Drying Yards	10 acres	Land = 400lakhs Drying yard of 1000m ² @ 1000 per m ² = 100 lakhs Total cost = 500 lakhs	No related schemes available	Either State government or entrepreneur to be explored with loan from banks	Nil
Mini semi integrated market yard	500m ² shed, 100m ² ×10 G.I sheets value addition, 4000MT storage capacity, 10 sales outlets for agri produce, input material and other home foods of 10m ² , repair and service centre for agriculture machinery of 50m ² capacity,	40 crores	Integrated Scheme for Agricultural Marketing	100% funded by govt.	Nil
Drainage facility	180km	5lakhs per km	No related schemes	100% funded by govt.	Nil
Hospital	Amenities to be improved in existing hospital, 7 new primary health centres in all villages	Rs.100lakhs for existing hospital, Rs. 60lakhs per each primary health centre Total cost = 520 lakhs	No related schemes	100% funds are bare by government	Nil
Degree college / professional institute (ITI)	Land 3 acres, buildings = 1000m ² , furniture, laboratory, miscellaneous	Land cost = 150lakhs Buildings = 160lakhs Laboratory = 100lakhs Miscellaneous = 50lakhs Total cost = 920lakhs	Ekalavya Model Residential Schools Sarva Siksha Abhiyan Schools	100% bare by government	Nil
Toilets at houses	10% of the houses need to be provided toilet facility	25000 per one toilet	Swachh Vidhyalaya Abhiyan	100% cost is funded by central government	Nil
Park	2 acres	Land = 2 crore Development and greenery= 100lakhs Miscellaneous = 5lakhs	No related schemes	100% by government	Nil

E. Justification for Facilities and Services

The justification for the identified facilities and services is presented in table 4.

Table 4 Justification for the identified facilities and services

Sector	Facilities and services	Justifications
Farmers	Better amenities at village level market days	Drinking water, raised floor, parking facilities for two wheelers to attract more customers
	Forming farmers producing	Facilitate to identify the interested farmers, form a

organizations (FPO)	group and train them on running FPO, brief the benefits available from NABARD and arrange visit to any successful FPO
Value addition	Facilitate FPO's, unemployed youth to establish primary processing units for value addition



	Advice on crop selection and agricultural produce that can be sold locally	Prepare a crop colony model and advice farmers on selection of right crop
	Exposure visit to model or progressing farmers farm	Facilitate to get exposure to high-tech, innovative forming and successful farm models
Aqua farmers	Access to extension service officer	Better access to extension officer at least thrice in a week
	Training on good practices	Facilitate to approach local fisheries department through local elected representative for providing training
	Training to get crop with acceptable antibiotics	Facilitate to approach local fisheries department through local elected representative for providing training
	Subsidised solar units to meet the power requirements of aerators	Facilitate to arrange an awareness programme on benefits of solar power and subsidies and loans
	Exposure to cage culture	Facilitate to approach local fisheries department through local elected representative for arranging exposure visit
	Supply of kits for water quality inspection	Facilitate to encourage and motivate to procure the testing kits as they are available at affordable price
Agricultural labour	Minimum wages under labour acts	Facilitate to open bank accounts and motivate them to go for savings on weekly basis
Aqua labour	Personal protective equipment	Facilitate to motivate the aqua farmers to arrange the PPE required
	First aid kit and medical camp	Facilitate to motivate the aqua farmers to arrange the first kit required
	Alternate	Facilitate to link up with

	employment during fishing holidays	Mahatma Gandhi National Rozgar Yojana (MNRY)
Home maker	Strengthening Dwakra groups	Facilitate to facilitate orientation to the exiting groups by the group leader of successful of Dwakra groups and exposure visit
	Strengthening Anganwadi	Give a representation to district collector about the lapses through local elected representative and continuous follow up
	Market support for home-made foods	Facilitate to form a group of manufactures of home-made foods and facilitate to establish a stall for selling
Fishermen	Alternative employment during fishing holiday	Facilitate to explore employment in agriculture and in construction industry during fishing holidays
	Compensation for boats	Facilitate to encourage and motivate fishermen to go for insurance
	Medical camps	Facilitate to facilitate periodical health camps
	First aid in all boats	Facilitate to facilitate to procurement of first aid kits
Aged persons	Generic medical store	Facilitate to explore and identify any unemployed youth with finance support from bank to establish one generic medical store
	Improvement of amenities in grave yards	Facilitate to explore donors for improving the facilities
Students	Field visits	Facilitate to arrange visits and tours that enhance practical
	Mid-day meals scheme with nutritious and hygiene food	Facilitate to have a healthy and hygienic food through agencies like Akshaya Pathra

F. Proposed Suitable Model for Infrastructure and Services

After studying the gap between existing infrastructure and expectations of stakeholders of the selected rurban, a suitable model for sustainable development of Nizampatnam rurban is prepared and presented in table 5.

Table 5 Proposed Suitable Model for Infrastructure and Services

Sector	Infrastructure	Facility / service
Agriculture	Individual storage facility (minimum 10MT capacity), bulk storage facility (3000MT), bores,	Better amenities at village level market days, sales outlet, value addition, forming farmers

	better establishment of road network, power supply for fields, Tractors, sowing, trans plantation and harvesting machinery	producing organizations (FPO), advice on crop selection and agricultural produce that can be sold locally, exposure visit to model or progressing farmers farms, Wages as per labour acts
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V. CONCLUSION

Majority of the people in and around Nizampatnam are depending on aquaculture, fishing activity, agriculture and allied activities. Aqua culture has become non-remunerative due to attack of diseases, which is necessitating usage of more antibiotics and resulting loss of export market and this is making non-remunerative. Agriculture has become non-remunerative as the farmers are going for traditional crops, no proper market facility no primary processing, poor linkage between producer and consumer, price fluctuations, lack of proper cold chain infrastructure resulting agriculture non-remunerative.

Drop in fish availability due to pollution, competition, lack of adequate drying, storage, integrated cold chain infrastructure, weak producer-customer link is resulting drop in income from fishing activity. Interaction with above stakeholders revealed that they are not happy in the present profession and feeling that labour who are going to towns for work in construction are earning more than what they are earning. If the same situation continues farmers, and fishermen expressed that they also think of going to urban areas in research of employment or other businesses

As aqua culture, agriculture and fishing activity are the main professions, in the Nizampatnam rural area, people in these professions to be made happy by making these professions for strong producer-consumer link, integrated cold chain infrastructure, value addition, storage, establishment of market yard, market facility for produce, exposure visit to successful farmers, encouraging agricultural allied activities, innovations, best practices and access to technicians/extension activities and access to ease and soft loans from public sector banks and horticulture based crops, crops based on crop colony, improving infrastructure for agriculture and aqua culture and fishing activity.

Other civil amenities such as improving roads, water supply, sanitation, health care, quality power supply, income generation sources to home makers are identified, appropriate schemes through which infrastructure can be created is identified and cost of additional infrastructure to be created and suitable and sustainable model for Nizampatnam rural is proposed.

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Aqua culture	Integrated cold chain facility which include 2000tonnes capacity cold storage, ice plant manufacturing facility, packing facility, weighing, freezer van, access to extension service officer, better road connectivity, quality power supply.	Training on good practices, exposure visits to successful farms, training to get crop with acceptable level of antibiotics, supply of kits for water quality inspection, exposure to cage culture, recycled aquaponics system (RAS), subsidised solar units to meet the power requirements of aerators, pumps and motors and others, Personal Protective equipment, first aid and conduction of medical camp, minimum facilities such as drinking water, alternative employment when there is no work in aqua farms.
Fishermen	Improving the boat making facility, boat repair facility, expanding fishing harbour facility to 400 boats, drying yard facility for fishes, storage facility, integrated cold chain facility for fishes	Compensation for boats in case of any damage, first aid in all boats, conducting medical camps, Alternative employment during fishing holiday
Home maker	Quality drinking water facility, drainage facility, upgraded facilities in Nizampatnam hospital, primary health centre in all villages, uninterrupted power supply	Strengthening Dwakra groups, strengthening Anganwadi, market support for home-made foods such as pickles, sweets and spices and garments, establishing markets similar to rythu bazar or market days covering all the villages
Students	Improvement in drinking water facility, washrooms, playground, labs, sports tools, site visits, drainage facility, library, hostels, building repair, institutes	Mid-day meals scheme with nutritious and hygiene, improving the computer facilities
Aged persons	Park, library	Improvement of grave yards, generic medical store, pension for all eligible aged persons



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