ELP305, Design and Systems Lab

Assignment GRAMINDIA: Tribe D

Final Proposal

Tribe D (DukhDard)
Submitted to: Prof. Subrat Kar, Instructor, ELP305 Design and Systems Lab

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1. Our Tribe

S.No.	Name	Entry No.	Role	Performance (out of 1)
1	Sanidhia Maheshwari	2019MT10762	Tribe Coordinator	1
2	Rishav Raj	2019MT10652	Supervisor	1

Documentation Team

S.No.	Name	Entry No.	Role	Performance (out of 1)
1	Bhavya Yadav	2019MT10684	Sub Coordinator	1
2	Aditi Jain	2019MT60739	Member	1
3	Pradim Siwa	2019MT10712	Member	1
4	Raunak Jain	2019MT10719	Member	1
4	Surya Sachan	2019EE30603	Member	1
5	Valaya Ramchandni	2019MT10731	Member	1

Sub Tribe 1: Textile, Industry and Animal Husbandry Sectors

S.No.	Name	Entry No.	Role	Performance (out of 1)
1	Ayush Singh	2019MT60748	Sub Coordinator	1
2	Abhinav Kumar	2019EE10945	Member	1
3	Ayush Chaudhary	2019EE10473	Member	1
4	Dyuti Bhardwaj	2019EE10475	Member	1
5	Gagandeep	2019MT10691	Member	1
6	Himanshu Meena	2019EE30573	Member	1
7	Pragna Varshini	2019EE30569	Member	1
8	Rahul kadam	2019EE10987	Member	1
9	Rohan Mahala	2019MT60760	Member	1
10	Shalini	2019EE30599	Member	1
11	Vibhu Goyal	2019MT10732	Member	1

Sub Tribe 2: Tourism and Infrastructure Sectors

S.No.	Name	Entry No.	Role	Performance (out of 1)
1	Saksham Sodani	2019MT10724	Sub Coordinator	1
2	Abhishek N. Singh	2019MT10669	Member	1
3	Arpit	2019EE30558	Member	1
4	Gaddam P.Jefferson	2019EE10476	Member	1
5	Ishan Digra	2019EE10485	Member	1
6	Ishan Jawale	2019EE30797	Member	1
7	Navya Arora	2019MT10707	Member	1
8	Sarthak Shrivastava	2019MT10725	Member	1
9	Sonu Besra	2019MT10729	Member	1
10	Vikash Kulhari	2019MT10733	Member	1

Sub Tribe 3: Salt production and Healthcare Sectors

S.No.	Name	Entry No.	Role	Performance (out of 1)
1	Mahesh Nimbal	2019EE10899	Sub Coordinator	1
2	Abhilasha Choudhary	2019EE10454	Member	0.5
3	Aranya Sen	2019MT60746	Member	1
4	Ayush Goyal	2019MT10961	Member	1
5	Jaskeerat Singh Saluja	2019MT60752	Member	1
6	Mitali Malav	2019MT10704	Member	0.6
7	Pradyumn	2019EE30588	Member	1
8	Prakash Khandelwal	2019EE10505	Member	1
9	Ritik Yadav	2019MT10759	Member	1
10	Sajal Tyagi	2019MT60761	Member	1
11	Satvik Singh	2019EE30598	Member	1

Sub Tribe 4: Agriculture and Education sectors

S.No.	Name	Entry No.	Role	Performance (out of 1)
1	Ojaswa Anand	2019MT10709	Sub Coordinator	1
2	Bhavik Goyal	2019EE30563	Member	1
3	K Dinesh Reddy	2019EE10489	Member	1
4	Lagishetti V. Maruthi	2019MT10262	Member	1
5	Manish Borthakur	2019MT60493	Member	1
6	Pranav Chawla	2019MT60757	Member	1
7	Rithwik Parikipandla	2019MT10720	Member	1
8	Sachin Tyagi	2019EE10514	Member	1
9	Sparsh Chaudhri	2019MT10765	Member	1
10	Sunny Kumar	2019EE10534	Member	1
11	Vatsal Singhal	2019EE10544	Member	1

2. Readability Indices

2.1 Documentation Statistics

Quantity	Value
Word Count	8416
Total number of complex words	1707
Average number of words per sentence	15.53
Total number of sentences	542
Average number of syllable per word	1.71

2.2 Document Readability indices

Indice	Value	Meaning
Flesch Kincaid Reading Ease	46.5	Easy for a 17 to 18 year old to understand
Flesch Kincaid Grade Level	10.6	Easy for a 11th to 12th grade student to understand
Gunning Fog Score	13.3	A college student can understand in first reading
SMOG Index	10.3	Easy for a 10th grade student to read the handwritting
Coleman Liau Index	14.2	A US college student can understand
Automated Readability Index	10.4	Easy for a US 10th grade level student to comprehend

3. Preamble

3.1 Abbreviations

Abbreviation	Definition
APMC	Agricultural Produce Market Committee
CGPDTM	Controller General of Patents, Designs, and Trade Marks
CSR	Corporate social responsibility
EMR	Electronic medical records
FICCI	Federation of Indian Chambers of Commerce and Industry
GPS	Global Positioning System
IOT	Internet of Things
LNG	Liquefied natural gas
MMU	Mobile Medical Unit
MSMEs	Micro, Small and Medium Enterprises
P2P	Person to Person
PHC	Public Health Centre
PPP	Public Private Partnership
SEWA	Self Employed Women Association
SEZs	Special Economic Zones

3.2 Units

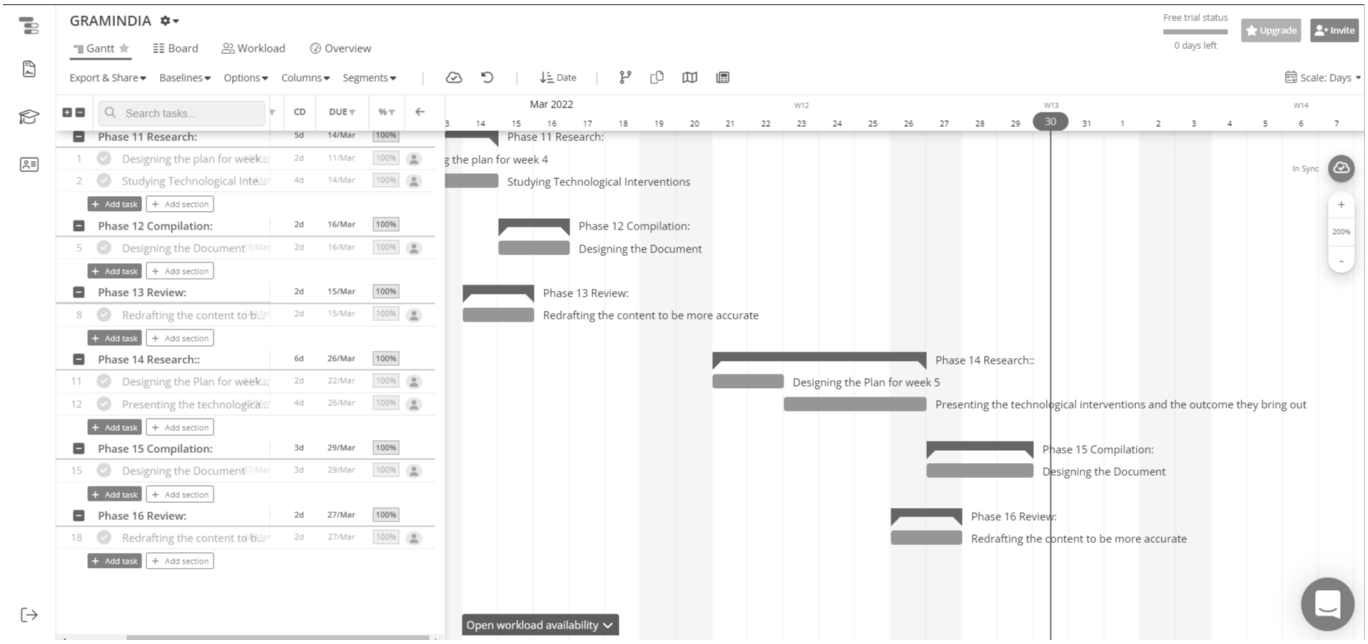
Unit	Definition
°C	Degree Celsius
km	Kilo Metre
MW	Mega Watt

3.3 List of Tables

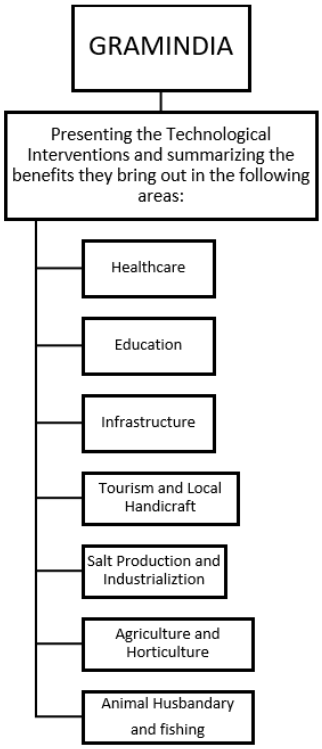
3.4 List of Figures

4. Project Management

4.1 Gantt Chart



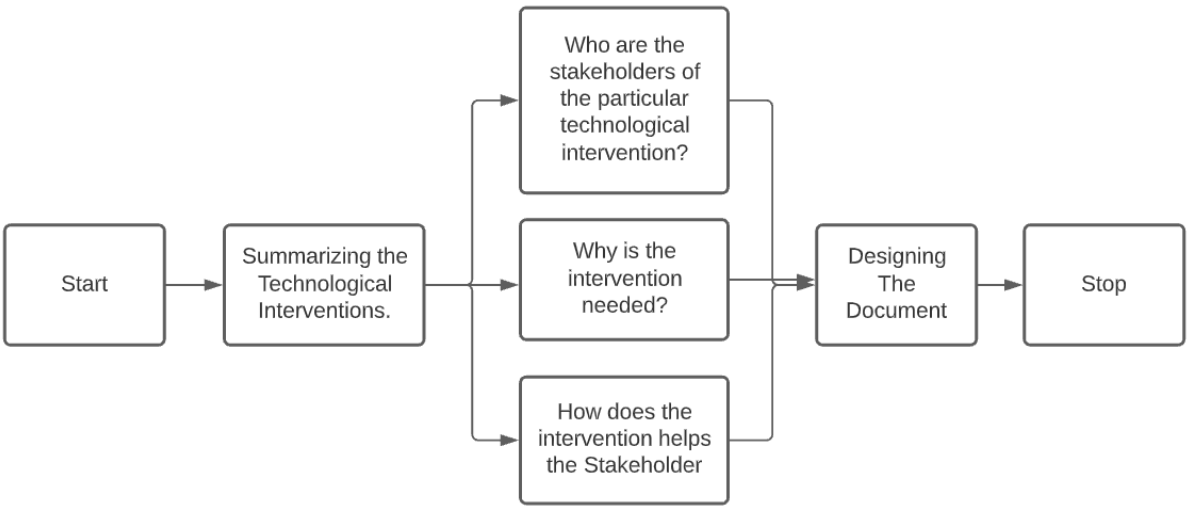
4.2 Work Packages



4.3 Resource View

Name	Entry No.	Work Assigned	Duration
Sanidhia Maheshwari	2019MT10762	Team Management	3 hrs
Risav Raj	2019MT10652	Content Review and discipline management	3 hrs
Ayush Singh	2019MT60748	Textile, Animal Husbandry and Tourism	3 hrs
Vibhu	2019MT10732	Handicraft and Textile Distribution	3 hrs
Gagandeep	2019MT10691	Animal Husbandry Distribution	3 hrs
Rahul kadam	2019EE10987	Handicraft and Textile Marketing	3 hrs
Himanshu Meena	2019EE30573	Handicraft and Textile Production	3 hrs
Abhinav Kumar	2019EE10945	Industries	3 hrs
Ayush Chaudhary	2019EE10473	Animal Husbandry Production	3 hrs
Rohan Mahala	2019MT60760	Handicraft and Textile Marketing	3 hrs
Pragna Varshini	2019EE30569	Animal Husbandry Marketing	3 hrs
Dyuti Bhardwaj	2019EE10475	Animal Husbandry Production	3 hrs
Shalini	2019EE30599	Industries	3 hrs
Saksham Sodani	2019MT10724	Tourism and Infrastructure	3 hrs
Navya Arora	2019MT10707	Infrastructure	3 hrs
Sarthak Shrivastava	2019MT10725	Tourism- Commute	3 hrs
Abhishek Narayan Singh	2019MT10669	Tourism- Fun Activities	3 hrs
Ishan Jawale	2019EE30797	Tourism- Resorts	3 hrs
Sonu Besra	2019MT10729	Tourism- Fun Activities	3 hrs
Ishan Digra	2019EE10485	Tourism- Food Chains	3 hrs
Vikash Kulhari	2019MT10733	Tourism- Commute	3 hrs
Arpit	2019EE30558	Infrastructure	3 hrs
Gaddam Praneel Jefferson	2019EE10476	Infrastructure	3 hrs
Mahesh Nimbal	2019EE10899	Salt production and Healthcare	3 hrs
Pradyumn Singh Rahar	2019EE30588	Health Care	3 hrs
Ritik Yadav	2019MT10759	Health Care	3 hrs
Satvik Shubham Singh	2019EE30598	Salt production	3 hrs
Aranya Sen	2019MT60746	Health Care	3 hrs
Ayush Goyal	2019MT10961	Salt production	3 hrs
Sajal Tyagi	2019MT60761	Health Care	3 hrs
Jaskeerat Singh Saluja	2019MT60752	Health Care	3 hrs
Mitali Malav	2019MT10704	Health Care	3 hrs
Abhilasha Choudhary	2019EE10454	Health Care	3 hrs
Prakash Khandelwal	2019EE10505	Salt production	3 hrs
Ojaswa Anand	2019MT10709	Agriculture and Education	3 hrs
Bhavik Goyal	2019EE30563	Agriculture Sector	3 hrs
Sachin Tyagi	2019EE10514	Agriculture Sector	3 hrs
Manish Borthakur	2019MT60493	Agriculture Sector	3 hrs
Sparsh Chaudhri	2019MT10765	Education Sector	3 hrs
Rithwik Parikipandla	2019MT10720	Education Sector	3 hrs
K Dinesh Reddy	2019EE10489	Agriculture Sector	3 hrs
Vatsal Singhal	2019EE10544	Education Sector	3 hrs
Lagishetti Vijay Maruthi	2019MT10262	Education Sector	3 hrs
Pranav Chawla	2019MT60757	Agriculture Sector	3 hrs
Sunny Kumar	2019EE10534	Education Sector	3 hrs
Bhavya Yadav	2019MT10684	Overall Documentation	3 hrs
Raunak Jain	2019MT10719	Overall Documentation	3 hrs
Aditi Jain	2019MT60839	Documentation for Sub Tribe	3 hrs
Surya Sachan	2019EE30603	Documentation for Sub Tribe	3 hrs
Valaya Ramchandni	2019MT10731	Documentation for Sub Tribe	3 hrs
Pradim Siwa	2019MT10712	Documentation for Sub Tribe	3 hrs

4.4 Critical Path Method



4.5 Tools Used

Tool Name	**Used for**
Overleaf	Writing and Compiling Latex Code
Instagantt	Making Gantt Chart
Mind Meister	Making Mindmaps
Lucid Charts	Making Flow Diagrams

5. Motivation

The people living in the rural parts of India face many difficulties in their lives. In this report, we present our final proposals and ideas for improving life in the region using technological interventions. For this we analyze different sectors available in the region.

6. Abstract

For the purpose of this project, the rural region of Runn of Kutch part of Gujarat has been chosen. The region is famous for the largest salt water lakes of India which is why it is also known as the "White Rann". The people in rural parts of this region face many problems. The development of the region is important to improve the lifestyle of the people. We basically aim to find technological solutions to problems that have a huge impact on the lifestyle of the people who work in these areas and their families.

Changes to improve the life of villages in Kachchh in the Education sector required an overhaul in the teachers, the infrastructure and the resource available. We filled the gap in resources using 4G technology. We have provided common colleges between villages and the transportation required for the students travel, providing remote education opportunities to those unwilling to send their children across villages. For the Agriculture sector, we have introduced drones and AI technology to help identify the required soil types, notify farmers of weather conditions and other changes to help them maximise crop quality.

We first surveyed the life of the people in the sectors of Handicraft, Animal Husbandry and Industries, major issues included lack of proper distribution means, absence of proper working conditions and equipment, and lack of marketing techniques that are widely used in urban areas.

Providing affordable visors and protective equipment like helmets , rubber boots and gloves to salt industry workers will reduced the risks of hazards. Solar Salt pumps have greatly reduced the diesel bills of the agariya community and hence they will have more income left for themselves.

Interventions like CT/MR PPP Model, Mobile Medical Unit, Central Diagnosis Labs have been introduced in the health care sector to improve health conditions. Activities like health screening of school children have helped in early identification of serious illness. It will also help in nutrition planning for children who are malnourished, obese etc.

7. Introduction

The villagers are the stakeholders of their own village. In requirements part 1, the lifestyle of the villagers and their resources were analysed. These resources can be used to develop the village and thus improve the lifestyle of people living there. So, there are stakeholders, other than the villager. These other stakeholders can invest in the existing resources to make a profit for themselves and also for the village. In requirements part 2, these stakeholders were identified. In specifications part 1 and part 2, technology interventions for life and livelihood at the individual/ home/ family/ community level and inter-community level were discussed respectively. In this final report, we present the summary of all interventions and how they affect the stakeholders. For this, each of the following sectors are analyzed one by one in the upcoming sections:

1. Agriculture
2. Education
3. Handicrafts and Textile
4. Animal Husbandry and Fisheries
5. Industries
6. Healthcare
7. Salt Production
8. Tourism
9. Infrastructure

Figure 1: Mind Map

8. Agriculture Sector

The following technical interventions can be implemented in region of Kutch in the field of Agriculture:

8.1 Use of Agricultural Drones

Drones can survey large crop areas in minimum time and expense. The gained data can regulate crop health, crop treatment, crop scouting, irrigation, field soil analysis and crop damage assessments. This can be combined with Artificial Intelligence to collect data and send crop damage reports to the farmer.

8.2 Use of Software Assistance

With the help of AI farmers can analyze weather conditions by using weather forecasting which helps them plan the type of crop that can be grown and when seeds should be sown. Supply cooperatives supply their members with inputs for agricultural production, including seeds, fertilizers, fuel, and machinery services. The following apps can be useful:

1. AgriMarket Mobile App can be used to keep farmers up-to-date with the crop prices.
2. AgriApp-Smart Farming App can be used to buy fertilizers to best grow their crops.
3. The AccuWeather app can help farmers decide when to work efficiently in their day-to-day operation. Wind forecasts play an important part when applying pest control products. Crop destroying pests can be influenced by weather conditions.

8.3 Use of Fertilizers and better Irrigation techniques

Being a water-scarce region, Kachchhcans make use of several irrigation methods like drip irrigation which efficiently maximizes the utility of the water available. Water can be supplied through canals or Borewells to the fields as Borewells are useful in areas with water shortages.

1. Soil and Water sensors are durable, unobtrusive and relatively inexpensive and can detect moisture and nitrogen levels, and the farm can use this information to determine when to water and fertilize. That results in more efficient use of resources and therefore lowered costs.
2. Stakeholders provide Pesticides, Agricultural Fertilizers, Fertilizer Urea, Insecticides and various types of seeds in Kutch
3. Gujarat Water Infrastructure Limited (GWIL) established a bulk water pipe grid based on Narmada water in Gujarat state for satisfying water needs of Gujarat state through bulk supply for the growth of Gujarat.

8.4 Use of Modern Equipment

Stakeholders provide various equipment like pulley, harvester blades, agriculture sprayers, tractors, harvesters, trucks and rotavators to the farmers. The following are the important equipment in which modern technology can be used:

1. The modern combine harvester is a versatile machine designed to efficiently harvest a variety of grain crops. The name derives from its combining four separate harvesting operations—reaping, threshing, gathering, and winnowing—into a single process. The separated straw is left lying on the field.
2. The development of roads helps reduce transportation costs and minimize the rotting of perishable items, the development of ports will aid agricultural product exports.
3. Fences can be used to protect the crops from animals. Trench-fencing is used to protect grass plots. Most agricultural fencing averages about 4 feet high. Stray animals can also be kept out by Propelling water, repellent, traps.

8.5 Community Contribution

Various villages sharing a common problem can form a cooperative together and work in overcoming the problem. Spatial Digital Databases can be used to keep track of current stock with farmers and accurately predict the demand for regular consumables, suggest how much to grow/sell such that price doesn't fall and demand is fulfilled. A cooperative society can help farmers coordinate for this:

1. Marketing cooperatives can be established to undertake transportation, packaging, distribution, and marketing of farm products. AI can also be used to make transportation packaging efficient by transporting goods at the same time and reduce transportation charges.
2. Online databases can be used to keep track of information about fertilizers, seeds taken and equipment borrowed, to make the cooperative society work efficiently. It can also streamline the loan process.
3. There are various societies for agriculture like Primary Agri. Credit Societies, Market societies, Milk and Livestock, Irrigation, in Kachchh etc for this purpose.
4. Women generally perform strenuous and time-consuming tasks with income disproportionate to effort. Women's association groups should be established to find better opportunities and to provide financial support to overcome this disproportion.
5. Several villages can come together and set up animal control offices which will overlook containment of stray animals as they pose other threats like transmission of life-threatening diseases.
6. Agricultural Produce Market Committee (APMC) regulates the Market for protecting Agriculturist sellers by cash and kind to establish a modern Market Yard with required facilities for producers and traders.

9. Education Sector

The following technical interventions can be implemented in region of Kutch in the field of Education:

9.1 Remote learning for women

Institutes for higher education are located in cities far away from the villages in Kutch and many parents fear sending their daughters so far away, to compensate for this Remote learning can be provided for such students can be facilitated via the internet.

9.2 Administrative changes for women empowerment

There is a need for increased involvement of women in decision making activities at the village level. This can be facilitated by:

1. Creating reservations for women in village level development organizations
2. Providing facilities for child care at village panchayats to make it easier for women to engage in these meetings

Increasing women participation in decision making activities has a two-fold benefit

1. More/ better schemes for tackling issues that women face
2. Exposure of women in the village to making decisions that have a wide impact

To achieve this, awareness should be spread amongst the villagers via documentaries and classes.

9.3 Inter-village distribution of used stationery, books and uniforms

At inter-village level, a cluster of villages can come together and collect enough goods(like promoting student's books, older uniforms of grown-up students and excess stationery items) to distribute it to the students who need it and don't have it. A digital inventory should be kept in order to avoid malpractice (such as selling off books instead of using it). Such a centralized system will enforce fair usage.
At village-level, this would be inefficient and unreliable because the number of enrollment in each grade is low and varies every year.
This can be achieved by a management team at taluka level(Taluka Education Officers) with 3-4 clusters in a taluka:

1. This team will carry out collection drives and donation of collected goods in a similar manner as Gujarat CSR Authorities' proposed Student Managed Libraries.
2. Currently, a government project to identify "potential" dropouts from 11th-12th grade is being worked on. This should be implemented in rural areas in order to take measures to prevent high dropout rates.

9.4 Use of Public Transportation

The main issue for transportation arises when people can't afford to stay in hostels provided by colleges or if they are not comfortable in studying at hostels and live within a radius of 50 km of colleges. So they have to travel by bus daily to and fro college.
Government buses should be used for regular transportation by allotting them a 2 hours time span in the morning and evening to ease travel.

9.5 Host Educational Radio

Educational needs need not be limited to children; we can even try to put the adults under the umbrella of education. For both adults and children, educational radios can be hosted at an inter-village level:

1. Radios are chosen as they are available in almost all phones, be it smartphone or an old brick phone, and can be accessed both outside when working/traveling and at home free of cost.
2. For children, lessons, stories, facts, and knowledge of important exams/opportunities/registration dates imparted over the radio. This can help students who miss classes or face difficulty in going to school.
3. For adults, we can have radio channels catering to local happenings, national and international news, as well as specific needs for example channels catering to farming practices, law changes, recommendations/machinery, animal husbandry, cattle trade, etc.

9.6 Establish Internet cafe

To solve the problem and connectivity and the cost brought by computers and laptops is relatively high compared to smartphones, Internet Cafes can be established in every village. These cafes can be run by a centralized server which can oversee each cafe, send technical assistance in case of hardware/software issues.

1. These Internet cafes provide facility to students for free (or minimum cost). These can be used to watch video lectures available on the internet provided free by various institutions and organizations. They can pursue courses floated online for free and give certification exams.
2. Increasing Employment: These internet cafes can also be used by institutions or organizations to give training to people in professional courses and then provide employment to them.

10. Handicraft and Textile

The following technical interventions can be implemented in region of Kutch in the field of Handicraft and Textile:

10.1 P2P e-commerce model

The peer-to-peer business concept enables craftspeople to earn money with little effort. There is no need to establish a production corporation or to worry about shipment; artists just collaborate within themselves and share resources. It will give the following benefits:

1. Financial benefits: This will benefit those who do not have a lot of money but wish to develop and have the potential to become something spectacular.
2. It provides craftspeople with new markets and increases the transparency of the value chain. It enables craftspeople to circumvent many intermediaries, resulting in increased income for artisans, decreased waste, and the possibility to offer buyers a wider choice of items.
3. Participants in P2P can not only increase their sales space and business scale to increase income, but they can also more easily accumulate credit through the digital footprint left on the e-commerce platform, effectively alleviating information asymmetry in financial transactions and lowering transaction costs. [1]

10.2 Digital tools for Personalization and Customization

Digital tools (online websites, mobile applications, and social media) expedite the process and boost efficiency. Customers can save time shopping for the items they desire. They may quickly look through a large number of goods at once and purchase what they like, this will also save time for craftspeople. When people shop online, they can locate things that are not available in nearby physical stores or are not available in their immediate area. [1]

10.3 Use of Social Media

Over the recent years, social media has been one of the most popular digital activities. With the penetration of smartphones and internet connectivity, there is a vast potential to tap a pan-India clientele through social media. It solves the issue of the poor marketing of products for the artisans and brings their products to the attention of people living in far-flung regions.

1. Artisans can advertise their handicraft products on social media platforms, particularly Facebook and Instagram. The ads on these platforms help users who see their friends like the page and check it out of curiosity.
2. The raw material suppliers can contact the artisans after viewing their ads on social media. Thus, they now have many options to sell the raw materials and no longer worry about the poor market for their supplies.
3. Artisans can be direct with the customers and build trust between them by reaching out on their phones through WhatsApp. They can create a WhatsApp group of customers and share the latest designs. In case of some confusion, they can make video calls to explain the details.
4. Artisans can now quickly learn new designs, use some equipment, marketing techniques, etc., on YouTube. They can also create a YouTube Channel to showcase their designs and creations. Customers can use YouTube to know the latest trending designs and buy whatever they like.

10.4 Design Registration

The design applications have to be filed with the Office of the Controller General of Patents, Designs, and Trade Marks (CGPDTM) at Kolkata, under the Department of Industrial Policy and Promotion (DIPP) in the Ministry of Commerce and Industry.

1. Awareness should be spread among handicraft artisans to register their design.
2. The design registration system can be made effective, cheap and more reachable by establishing registration units in more places. [2]

10.5 A use of AI based tools

They can be used to analyse the craft and register the design. These tools can create a model of the design which will be then difficult to copy or fake because AI can detect and compare the faked design with the already registered design.

1. First step: The new craft to be registered is checked with the existing models or features of similar crafts in the database. Then it is categorized as new (design can be registered) or not new.
2. Input of this tool can be: Image of the craft, Hardware or software/ material and quality used in making the craft.
3. Output: A model depicting unique features of the craft. It is now registered in the database.

10.6 Handicraft School

The handicraft school is such that artisans from the different villages can join this school to do group work. In which skilled handicrafts artisans can teach to other handicraft artisans, get knowledge about new designs.it will support the local economy and the livelihood of artists. Some craft groups are able to recruit expert instructors to teach intermediate and advanced techniques. A group environment is a great way to learn new skills in your chosen craft and to get help with problem areas. Veteran craftsmen love to share knowledge and are happy to help.
The handicraft industry in Kutch is basically compartmentalised in the household industry due to this artisans are unaware of present market trends. Public art reflects a community and its surroundings working to cultivate a cultural identity by setting a community apart and attracting people to its uniqueness. Artwork helps express a community's values and creates an elevated sense of awareness for community members and visitors. Art brings people together. Displaying art in public places and making it accessible to everyone inspires engagement and a feeling of belonging to a community. The handicraft school would:

1. Provide different types of facilities to encourage the artisans for their work
2. Update about government /non-government initiatives for artisans And help is provided to artisans to get these initiatives
3. Provide teaching, learning, group work, and create job opportunity

4. Provide vehicles services, financial help
5. Provide a supply of raw materials and new designs to the artisans and weavers. New Initiatives can adopt similar to KNNA, Craft Park in Bhuj, CII–KNNA, Business Resource Centre of FICCI - CARE for handicraft development in the region.

Working on craft projects in a group setting allows a natural flow of conversation about techniques or problems, but just as often about everyday struggles and triumphs. Friendships are easily developed.
School can organize workshops for artisans to learn advanced technical- machine, handicraft artisans from different villages can also attend these workshops.
Non-Government Organisations like Srujan, Kutch Mahila Vikas Sangathan, Kala Raksha, SEWA, Dastakar and VRTI are working with handicraft artisans by forming societies and they will help to handicraft school also.
These types of centres are helpful for integrated handicraft manufacturing design, training and trade centre, a new industry partnership, financing and marketing model, integration with the tourism industry, take part in international shows such as Dallas Super Market The show, USA, Asian Gifts, Premium and Household Product Show, Hong Kong International Gifts and House Ware, Giftionery, Taipei, etc.
To connect this school with more people we can publish it on Web Portal and social media so that everyone should get information about it. Handicraft items are also getting space in online trading. By creating Association Like Self Employed Women Association (SEWA) and creating a website in which booked orders through their websites and send products directly to purchasers. With the help of web marketing, We can increase tourism in these areas.

11. Animal Husbandry and Fisheries

The following technical interventions can be implemented in region of Kutch in the field of Animal Husbandry and Fisheries:

11.1 Cold storage and facilities

Work: The work is to build a community cold storage for the products from animal husbandry and fisheries products It also includes having facilities in different cold storage like availability of small purchasable refrigerants/freezers, vehicles with refrigerants for supplies, and availability of the preservatives at the facility. We can build a web/app application for the ease of this process, booking/charge of the services.
Stakeholders: The main stakeholders are the locals using this facility, Companies from which we are taking machinery, vehicles.
Benefits: The shelf life of products depends on the temperature, keeping the products at cold temperature will increase the shelf life of the various animal husbandry and fisheries products. It will also help in the distribution/exporting or supply of the products.

11.2 Milk Automation

Work: Using different sensors for milk automation the milk automation technique will automatically collect the milk. The milk collected will depend on the cattle's health conditions collected via sensors.
Stakeholders: the main stakeholders are the cattle farms, and the companies providing the facilities for the milk automation technique.
Benefits: The two main benefits are saving a lot of man-work, thus saving a lot of time. Secondly, the milk is collected on the basis of cattle health, so cattle health is the priority, thus it increases the production as the health of cattle is kept in mind.

11.3 Veterinary doctors for Cattle and poultry farms

Work: The work is to provide a veterinary doctor for proper guidance/consulting to the ones at animal husbandry, poultry farming, and fisheries work apart from dealing with the health issues of the animals. We can build a web/app application for the ease of this process So that the guidance will be easily available at their fingertips, and easy consulting on their mobile phones.
Stakeholders: the main stakeholders are the cattle, poultry farm owners, the doctor, and the equipment and medicines providing pharma.
Benefits: the main benefit is that of the cattle, poultry animals are in good health with proper consulting with veterinary doctors, the production will be more thus directly benefiting the locals /farm owners.

11.4 Websites or portals to organize the dairy business

The various stakeholders are cattle farmers who sell their milk to the various vendors, local vendors and dairy product companies and even fodder or dairy equipment providers whose business can grow on a pan India level if they list their company on this website.
The company which builds the website and and grows the technology, the company which is responsible for the distribution of orders made on this website including every delivery person is an indirect stakeholder.
People can list their dairy related products on this website on an individual level or as a company and conduct business in an online fashion. This will create an ease of business and increased scale for the direct stakeholders.
Notifications on the website can also be provided to various stakeholders through messages on their phone in case internet facility is not there.

11.5 Rainwater Harvesting

The various stakeholders are all the local villagers and the individual cattle owners who need a good water supply to produce large amounts of high quality milk and grow fodder.
All the villagers can come together and make a system to collect and store rainwater along with the help of the government for funds for the infrastructure to conduct rainwater harvesting on a large scale to cater to the water.

11.6 App using AI and IoT services

The various stakeholders are cattle farmers who need take care of the health of the cattle to produce good quality milk. The vets who provide consultation to these farmers whenever the app detects some health or nutrition or pregnancy of the cows are also direct stakeholders.
The entrepreneurs working on the technology building and the maintenance of services for the customers are the indirect stakeholders.
Proper functioning of this requires motivated individuals to provide the services to the cattle owners.
The app will be designed in vernacular language along with symbols and voice commands to make sure that everyone can use them. Proper training will be given to the individuals who use the app.
Mainly it will be used by one member in a single farm and the device can be kept in a stand inside the cow shed. Maintenance will not be a issue as the tag will be waterproof.

12. Industries

The stakeholders include people in the district and nearby areas, private companies, government industries, government bodies. The flourishment of the industry will directly impact the development of that area as more industries will lead to more job generation and more people would get employed. Also, the development of the industry will bring many people outside the village in that area and will eventually lead to the creation of new businesses like hostels, restaurants, etc. In this way, many people can start their own ventures.
Following are actions recommended impacting industries across all sub-sectors, for consolidating the current pace of industrialization and attracting further investment in the industry sector:

1. Land allocation/allotment permissions to be accelerated and streamlined
2. Upgrade roads and connectivity further and also extend the rail connectivity in the region, special attention institutional arrangement may be put in place for allocating water allocation to industries, including to Industrial Estates
3. Grant electricity duty exemption/ concession for 5 years to select industries that are power cost-sensitive including captive power plants, maybe with limits linked to investment, employment, and local content in terms of man and materials
4. Transport subsidy to select industries say salt and minerals which together account for the employment of 50000 to 60000 workmen. It will impact the economic conditions of the worker and attract more workers.
5. Promote LNG terminal and LNG-based Power Plant
6. Encourage desalination plants put up by large/mega industries and estates Page 16 GRAMINDIA: Week 4 Tribe - D

7. Promote 2-3 more specialised industrial parks and trading centres providing full infrastructure facilities besides 2 SEZs

8. There is a huge scope for further development of the ancillary units like spares and parts useful in various types of industries in huge quantities. So, ancillary engineering and packing industries can be developed in the district. Under industrial development strategy following two-pronged strategies can be adopted:

   8.1 Selection of Mega Projects which are attracted based on the unique zone attributes in terms of immediate/extended hinterland resources, strategic geographic location, availability of natural resources in the region, and presence of a functional and efficient port.

   8.2 Cluster those economic activities which have a global interaction either in terms of import or export /re-export and are attracted because of SEZs and efficient ports.

12.1 Intervention in small scale industries

The main stakeholders of this would be small scale industries, local entrepreneurs and local people of the area. The main issue for small scale industries is that the people don't know about the various schemes introduced by various governments(state and central) for encouragement and upliftment of the industry. There are lots of incentives and packages specially designed for MSMEs but most of the local entrepreneurs remain unaware of it.

1. The program can be broadcasted on television, bridging the gap between government offices and the public, conveying all the updated details of various schemes and also informing the procedure and pre-requisite of the schemes.

2. India's installed capacity of renewable energy is 88,793.43 MW and the country has a target of 175,000 MW of renewable power. Considering these programs can be launched between top institutes and industry could lead to the development of new technologies customised on the terrain and weather conditions. This will create a great number of job opportunities for the community.

3. An app can also be developed regularly featuring all the job openings in the local areas which create ease for industry, entrepreneurs and workers. It will abolish the need for a middleman and the full amount can be paid to the worker.

13. Healthcare

The following technical interventions can be implemented in region of Kutch in the field of Healthcare:

1. **App for controlling Tobacco consumption:** The first major impact is that the villagers will benefit from it. Tobacco induced diseases have grave impact on health(as discussed in the week 3 submission) and affect a majority of rural population. This intervention will also lead to reduction of load on rural healthcare facilities and as the diseases caused by tobacco are very costly to cure, this will also save villagers from unnecessary spendings.

2. **CT/MR PPP Model:** First the private enterprise that manufactures the CT and MR machines will have prospering business. There will be reduction of load on healthcare services and there would be better diagnostic services for the people.

3. **Portable Oxygen Generator:** This device affects mainly patients who have respiratory diseases like asthma, pneumonia etc. With the recent cases of COVID-19, it the number of stakeholders impacted by this device is quite large.

4. **Mobile Medical Unit(MMU):** All the villagers who need the healthcare service are the major stakeholders of this intervention of Mobile medical unit(MMU). The villagers can avail the medical facility in their village itself without going out to a nearby city. It is very convenient for the villagers and it can save the travel cost of the villagers as well.

   Here, the government, who is the health care service provider, is also a stakeholder , with this MMU service it will be easy to manage the healthcare facility in the rural areas.

5. **Central Medicine Delivery:** All villagers are the stakeholders of this intervention. Prompt and affordable delivery of medicines would especially help people from the weaker economic section as it would make it easier to access some medicines which may not be easily available in rural areas, which the relatively well-off section may be able to afford. In the long run it would help all the secondary stakeholders such as their employers as well, as a healthy person would be able to do better work than an unhealthy one. It would benefit the community as a whole as instead of having to commute for buying the same medicines, they get it delivered directly to their village, replacing multiple commutes with a single commute.

6. **Peer educators:** All villagers and especially uneducated people will be really helped by this initiative. It will make the village community more aware and hence they will seek medical care sooner when they recognize certain symptoms.

7. **Digital HealthCare Services in Rural Communities:** Physical medical records may get displaced,burned,etc. while there is no such issue with electronic medical records (EMR). EMR will contain the patient's entire medical history and thus when the records are shared with a specialist living in urban regions, it could aid the doctor in deciding the right course of procedure for treating the patient. Hence, all villagers who visit the doctor for any reason will be impacted by this intervention.

8. **Central Diagnosis Labs:** By setting up these central labs there would be early detection of common diseases that will help reduction of spread of diseases like malaria. This will also help increase research interest in making low cost detection kits for various diseases.

9. **Health Screening of School Children:** School age children are not very serious about their health and hence these regular camps will be beneficial in testing any serious illness they may have which has gone unnoticed. It will also help in nutrition planning for children who are malnourished, obese etc.

14. Salt Production

The following technical interventions can be implemented in region of Kutch in the field of Salt Production:

1. **Affordable visors and helmets:** This intervention will ensure the safety of all salt workers and will help prevent serious injuries caused by raw salt entering their eyes.

2. **Rubber boots and gloves:** This intervention affects all salt workers hugely. It protects them from the harmful effect of salt from staying in contact with the body repeatedly over long periods of time. It would prevent dermatological problems ranging from but not limited to itching, ulceration, cracked skin and burning sensation in skin.

3. **Special Fabrics:** This easy fabric on salt workers will help their body to efficiently pass heat so that they don't have to make their skin exposed to the sun for their body radiation, this would keep them safe from harmful UV rays of the sun to a large extent.

4. **Centralized local healthcare facility:** Salt mining workers suffer from various diseases caused from their line of work like gangrene etc. Building such local healthcare facility will greatly help the salt care workers from staying safe from various diseases that will increase their income overall and thus their quality of life in general. This will need some intervention from government and the industry but this will benefit them in the long run as the health of salt mining workers will remain good and will increase productivity of the salt mining workers and thus increase salt production of the industry.

5. **Solar Salt Pumps:**Using these pumps will reduce the diesel bills of the agariya community and hence they will have more income left for themselves.

6. **Salt Consultancy services:** This will increase the production of salt and also increase the business of these salt consultancy services that will also increase employment and increase income of villagers.

15. Tourism

The following are the technological interventions in various field of Tourism:

15.1 Resorts

1. **Dealing with Water Scarcity:** Water scarcity is acute in many parts of Kutch. Constructing resorts and maintaining them with amenities like swimming pools is very water expensive. Thus, there is a need to use water judiciously and efficiently.

    1.1 Resorts need to have an efficient water management plan.

    1.2 Rainwater harvesting should be done whenever possible. Efficient techniques such as using percolation tanks, recharge pits, or dug wells can be used.

1.3 Most of the water available in the region through the sea or the ground is saline. This saline water can be diluted with amounts of fresh water and treated with chlorine to be used in swimming pools.

1.4 The gray water which refers to wastewater generated in resorts from laundry, washing, or bathing can be reused for the purposes of irrigation and toilet flushing.

1.5 For resorts that are near beaches, advanced technology can be used to desalinate the water and get fresh water.

2. **Use of solar panels:** Kutch is the largest salt desert in the world which receives abundant intense sunlight throughout the year. Extensive use of solar panels should be done to save energy which would also cut the cost of electricity.

   2.1 A 30 room hotel, on average consumes about 900-1200 kWh of electricity.

   2.2 It is estimated that 1 square meter of solar panel can produce up to about 4 kWh of electricity. a 20 meter square solar panel can roughly produce 80 kWh daily. This is about 1% of the energy requirement of the resort and hence can be significant.

3. **Dealing with Network connectivity:** Network connectivity is a big problem in Kutch, and most areas outside the living areas do not have any network at all. Resorts in remote regions of Kutch should provide WiFi so that the guests can stay connected.

15.2 Food Chain

1. **Delivery system:** In Kutch, there is a problem with the centralization of the delivery system. The advent of food delivery services such as uber eats, zomato, and other similar services, as well as a local centralized delivery system, may assist in the expansion of the food chain. Due to the fact that the settlements in Kutch are dispersed across long distances, mobile food buses are a more practical alternative.

2. **Hygiene:** Another problem that may be readily resolved is the issue of hygiene, which can be addressed by making it essential to wear gloves and hair caps. Additionally, locating the business in a suitable location, such as one that is distant from a rubbish dump or a meat market, might be beneficial.

15.3 Fun Activities

Many travel agencies, such as makemytrip, thrillophilia, and yatra.com, offer tour packages that include sightseeing and entertaining activities. The following are some of the most well-known activities in the area:

1. **The beach in Mandvi:** Quad biking, zorbing, dirt biking, horseback riding, and camel rides are among the water sports available, as are ocean swimming, parasailing, and banana boat excursions. Other adventure sports available include quad biking, zorbing, dirt biking, horseback riding, and camel riding. Blue star water sports is one of the most well-known companies that offer a variety of water activities such as speed boat rides, jet ski rides, and parasailing. Outside of Kutch, the safety and ride-related equipments are purchased. Stakeholders include a variety of manufacturers and special service providers.

2. **Rann Utsav and the White Desert:** Rock climbing, rappelling, pendulum swing, zipline tower, paramotoring, rifle shooting, paragliding, star gazing, cycling, dirt biking, ATV ride, camel cart, golf cart, and hot air balloon. Outside of Kutch, the safety and ride-related equipment are purchased. Stakeholders include a variety of manufacturers and special service providers. Cultural dance performances and live music concerts are two more enjoyable pastimes.

3. **Art, Culture, and Handicrafts:** Kutch is known for its different handicraft goods such as garment embroidery, hand wall painting, jewelry, wood carving, and wall paintings, among other things. Exotic handcrafted Gujarati items include Bandhani sarees, silver articles, leather goods, and delicate Kutchi embroidery. Tools and raw materials for all this are bought from different parts of India.

The number of tourists visiting Kutch each year has increased dramatically since the event began. Rock Climbing, Rappelling Walls, Pendulum Swings, Zipline Towers, Paramotoring, All Terrain Vehicles (ATV) bikes, Rifle Shooting, Bungee Run Basketball, and Star Gazing are just a few of the entertaining activities available to tourists in Kutch. Many technologies are employed in these activities, which can be upgraded and modified to improve efficiency, and new technologies can be introduced in the fields of paragliding, parasailing, electric bikes, and zipline towers with increased security features to increase Kutch's visitor intake.
In paragliding/parasailing, a hybrid protection system that combines the benefits of an airbag and foam can be utilized to increase passive paragliding flight safety. 3-liners technology was introduced, allowing 3-line parades to adjust the flight

angle. ATVs, which are vehicles that run on low-pressure tires and have a seat that is straddled by the operator, as well as handlebars for steering control, are also utilized for leisure activities. It's built to tackle a broader range of terrain than most other vehicles.

15.4 Commute

1. **Information on the Internet:** We can supply an increasing amount of information on the internet regarding travel agencies, tourist attractions, restaurants, and their meal costs, hotels and their rates, traffic information, maps and routes, local culture and particular foods, and so on. This will attract more tourists and will be beneficial for them. The internet website will also provide information for tourists to travel cost-effectively. More information like forecasting road and weather conditions can be provided on Internet websites. The following are the benefits:
   - 1.1 For travelers: cheap and easy access to information at any time of day, week, or year.
   - 1.2 For the community: stimulates the local economy, brings tourist revenue into a region, and promotes local business to residents.
   - 1.3 For the public sector: cost-effective supplement to existing tourism information services.
2. **Speed warning systems and Sensors:** Vehicles traveling too fast for conditions, particularly on curves or long downslopes increase their risk and hence their likelihood of being involved in an accident. Installation of sensors and warning systems on road will be beneficial in the following ways:
   - 2.1 Warnings to drivers about construction or maintenance occurring ahead.
   - 2.2 Temporary speed advisories/warnings due to construction activities or severe weather conditions
   - 2.3 Increased safety at dangerous curves downgrades
   - 2.4 Sensors could provide data on current travel times or average operating speeds to maintenance or construction personnel
   - 2.5 Temporary speed limits - either regulatory or advisory limits
   - 2.6 Diversion advice to drivers
   - 2.7 Decrease in vehicle repair and other costs due to fewer accidents
3. **Coordinate addressing system in Rural areas:** The main goal is to improve emergency services and others' ability to locate rural locations through a low-cost addressing system. This can be done by truncating plane coordinates in the state to an accuracy of 100 feet, by assigning unique addresses to rural areas, hospitals, for schools. This addressing system might also be employed as a component of a traveler information system, allowing for the transmission to travelers of the specific locations of points of interest, such as rest breaks, gas stations, or historically significant markers. The following are the benefits:
   - 3.1 Rural residents will have improved service in case of emergencies
   - 3.2 Increased efficiency when delivering products and services to residents of rural areas
   - 3.3 Improved ease and speed of locating rural addresses for service providers
4. **Safety of bicycle and road sharing:** The goal is to enable bicyclists to share roads safely with other vehicles. The technology might be introduced to detect bicycles on-road and warn other vehicles for limiting their speed. This will help bicyclists to drive safely on roads and it will also minimize road accidents.

16. Infrastructure

16.1 Textile industries and mills

In Indian textile sectors weaving, processing and garmenting are fragmented and lack in output and global standards. Most of the manufacturing units have small capacities and low manufacturing efficiencies with not much high quality skill and productivity which are a disadvantage in the global arena. For high productivity and making them capable on global market competition following 5 points strategy could be helpful for achieving textile industry development in Kutch:[3]

1. **Achieving Scale across the Value Chain:** To bring them at par with global counterparts there is a need to facilitate rapid growth and modernization of existing firms with potential for success.
   Small scale is a huge drawback in the Indian textile industry. Countries like China and Bangladesh have already developed large production. Because of the small scale Indian textile industry is not able to cope up with large orders . To cope-up with the global standards and reasonable output cooperative should be formed that would help in further development in quality and much efficient and high output.

2. **Attract Investment into the Sector:** Investment would help in coping up with large output and better quality. Lowering the cost of production as well as the cost of logistics would be of paramount importance and should be given highest priority. For gaining investment a cooperative brand can be formed.

3. **Skill,Quality and Productivity:** Productive and skilled manpower is the only way to achieve global competitiveness and to derive the full benefit of the demographic and wage advantage that India would clearly have over the next decade.The objective should be to achieve average per man hour, per machine output in terms of quality and quantity of the levels prevailing in China over the next three to five years.

4. **Structural Shift with increasing Value Addition:** India has a share of approximately 5% of the global textile and apparel trade.The break-up of our current exports are as follows: i. Cotton Fiber: 9% ii. Cotton Yarn, Fabrics and Made ups: 23% iii. Man-made Textiles: 14% iv. Garments: 39% v. Handlooms Handicrafts: 11% vi. Others: 4%. professional agencies should be hired from the target country to advise on an appropriate market specific strategy

5. **Promoting Innovation and RD:** The Indian textile and apparel sector is known for its traditional products. India is yet to make its presence felt on the global stage with brands, chains, products and processes.

6. **Business Process Innovations:** Brand India needs to be promoted.Internationally e-commerce has emerged as a highly successful and efficient business model. It is recommended that active coordination should be done with various large international online marketing platforms. To improve cotton yields, adoption of improved irrigation and agriculture practices should be promoted. International best practices to improve yields with reduction in inputs should be reviewed and adapted in Indian context.For the benefit of farmers, smartphone apps providing information support schemes, prevailing weather and soil conditions, market information, etc. should be developed in local languages.

16.2 Primary Health Care Facilities

One of the main drawbacks in villages is its own distance to the most sophisticated medical technologies and experienced doctors. This factor often causes many to migrate for their livelihood especially when someone has got serious health concerns. Many succumb to death due to delay in transportation and lack of facilities at local hospitals. So, this is a big deal of concern for us not just a matter of improving standards of living but the cost of reliability on medical availability at a time of high demand. Following are the ways to contribute for the betterment of the PHC in villages in Kutch: [4] [5]

1. Many of the professional doctors and staff allotted to the centers prefer to live in cities with their families and do an up and down for their job. This rules out the possibility of their assistance at needed times owing to the distance. Good living facilities should be provided for them to encourage them to stay in villages and there by dealing the times of emergency.

2. The training of MBBS should be aligned towards producing rural family physicians and of nursing graduates to produce rural primary care nurses.

3. Medical equipment like laboratory diagnostic equipment, Ventilators, protective and specialized equipment, defibrillators, resuscitation and oxygen supplementation equipment should be supplied in good numbers and at the required locations.

4. Higher investments in Health care and to ensure better tracking to make sure that it reaches underground level with best efficiency and these are spent on the right objectives to achieve best of the health care outcomes.

5. State funded health insurance and implications in primary health care centers. This would strengthen primary health centers boosting secondary and tertiary health center as planned by the central government. It would also improve the efficiency by reducing the unnecessary referrals.

6. Availability of Rural training sites to enhance community based rural training sites for large number of doctors and nurses and also some basic training to villagers to educate them regarding the care to be taken in times of extreme emergencies.

16.3 Water supply to village and Irrigation pipelines

Rural water supplies have traditionally been overshadowed by urban ones. That must now change, as the Sustainable Development Goals calls for water for all. The objective is to assess the current access to and the perceived water quality in villages with various types of water supply. Water now can include a lot of purposes like drinking, commercial, construction, planting and cultivation and the list goes on. The villages in Kutch region face water scarcity due to the

latitudinal location, topography, climatic and environmental factors. Here are few ways to improve the availability and efficient management of water: [6][7]

1. **Safe drinking water:** Majority of the rural areas lack access to potable water and often their viable sources become hazardous due to addition of dangerous chemicals and pesticides thereby giving a scope to water borne diseases. Two innovations which can be used for the process are Jalkalp and Matikalp filters.

    1.1 JalKalp is effective against pathogens such as E. coli, total coliforms, parasites, microbes, and worms, as well as eliminating turbidity, iron, manganese, and arsenic contamination.

    1.2 MatiKalp takes care of pathogens, iron, and manganese present in water.

2. Water runoff and wastage often puts a pressure on its inflow. Finding efficient ways to recharge them using schemes implemented in the region like Accelerated Irrigation Benefit Program, Integrated watershed management program and micro irrigation programmes like sprinkler irrigation, rain guns, drips should be encouraged. Traditional methods like percolation tanks, rain harvesting can also bring about a significant change when implemented for a long time.

3. Implementation of Qanet or Karez which is a system of underground vertical shafts in a gently sloping tunnel that is build from an upland aquifer to ground level. This network of water pipelines can contribute immensely for irrigation and keep a check on water scarcity.

4. Fertigation consists of combining water and fertilizers for irrigation results in balanced nutrient application and cuts down fertilizer requirement around 7% to 42% which reduces the risk of water getting contaminated. This water can be used for drinking and for daily essential needs.

16.4 Sanitation

With the exception of improved toilets - a facility that safely separates human waste from human contact - people have no choice but to use inadequate public toilets or to practice open sewage. In the vicinity, the excreted waste will be diverted back to human food and water sources, helping to spread serious diseases such as cholera. Apart from the community, the lack of effective sanitation or sanitation systems can pollute the environment and contribute to the epidemic. The following steps can lead to better sanitation and hygiene: [8]

1. **The use of appropriate technology for different placement zones:** For new home toilets in the following topographies, modifications can be made to the toilet technology as appropriate. In areas with high water levels and frequent flooding seasons, considering the risk of contamination of the groundwater, the structure of the toilet can be adjusted by raising a hole above the ground and closing the open ground with a leachate dune mound. In rocky soils where cracks in the contaminants spread rocks, toilets connected to biogas plants, ecosan toilets and septic tanks with secondary treatment systems can be used.

2. **Renovation of toilets:** Toilets built in rural India have single pits and septic tanks.To ensure future sustainability, they may be re-installed. One-hole toilets can be re-installed into a double pit, so that they can be used continuously. Construction of dug holes for septic tanks, wherever they are not.

3. **Solid Waste Management:** The SWM strategy will work on two basic principles- 1. Separation of waste streams from the source to allow safe management and resource conservation 2. Reduce-Reuse-Restore-Restore (power) - Refuse (deplete) resource-saving paradigm as shown in the following table:

Type of Waste	**Collection Options**	**Strategy for disposal/treatment**
Bio-degradable household waste and cattle waste	Routine collection using low cost vehicles such as tri-cycles	Composting or biogas plants at households and community level
Non-bio-degradable household waste with larger focus on plastic waste	Routine collection using low cost vehicles such as tri-cycles	Storage infrastructure at village level for consequence appropriate disposal
		Material Recovery Facility at block level for consequence appropriate disposal

Table 1: Strategies for Solid Waste Management[8]

4. **Greywater Management:** Greywater wastewater is obtained through the use of water in kitchens, baths and laundry. If not properly controlled the water is decaying which leads to mosquito breeding and disease outbreaks or it can reach ponds, ponds and rivers causing both bacterial and chemical pollution. At the community level immersion pits and leach pits can be built.

5. **Waste Management:** Twin pit toilet technology will be the preferred toilet technology option. A small, deep hole can be built in a remote garbage dump town also known as trenching. Fecal Mud Treatment Plants (FSTPs) can be made from clusters that can be beneficial in a large area.

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