PPHI SINDH

Warehouse Assessment of PPHI Sindh

Research & Training Wing
PPHI Sindh

April 2020

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Acknowledgements

First and foremost, Research & Training Wing (RTW) would like to acknowledge gratitude to Mr. Fazal-ur-Rehman (Chairperson, BoD) and other members of BoD for showing their trust on the Research Wing.

We also recognize that we could not have completed this task without the facilitation from Mr. Abdul Wahab Soomro (CEO, PPHI Sindh) and Mr. Ghulam Soomro (COO, PPHI Sindh).

During planning phase of warehouse assessment, RW had in-depth discussion with Mr. Syed Shahid Ali (Director Procurement), Dr. Zaib Dhar (Senior Technical Advisor) and Mr. Imran Chandio (Senior Manager – Procurement) for their insight on the warehouse assessment tool. They provided very valuable suggestion during the review process.

From the field, we are also thankful to the Regional Directors of all four regions and their respective District Managers.

We owe special thanks to members of the assessment team who completed the field work with their full dedication. They provided their contributions not only in form of data collection but also provided their feedback from the field.

List of Abbreviations

ADC	Automated Data Collection
BHU	Basic Health Unit
DO	District Office
ERP	Enterprise Resource Planning
FEFO	First Expire, First Out
GD	General Dispensary
GPS	Global Positioning System
M&E	Monitoring & Evaluation
MCHC	Mother & Child Healthcare Center
MNCH	Mother, Neonatal & Child Health
ODK	Open Data Kit
PPE	Personal Protective Equipment
RHC	Rural Health Center
SOP	Standard Operating Procedure
USAID	United States Aid
WMS	Warehouse Management System

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Preface

As outlined by World Health Organization, *"a well-functioning health system working in harmony is built on having trained and motivated health workers, well-maintained infrastructure, and a reliable supply of medicines and technology."*. Therefore, since its inception PPHI Sindh has always focused on these pillars of health system while developing its policies. Considering this, PPHI's management undertook *first-ever* assessment of its warehouses across Sindh province. Research & Training Wing conducted warehouse assessment highlighting some very critical areas and gaps that would enable the organization to address and improve by developing future guidelines to further strengthening the warehouse management.

Warehouse management is not just entity consist of purchasing contracts and shipping to healthcare facilities. Rather, a proper warehouse management is an entity *all-inclusive* of warehouse distribution, structure, equipment and inventory management. Focal areas of this warehouse assessment were *warehouse infrastructure, operational efficiency, equipment, special storage requirement, inventory management, security & safety and human resources.* This report animates these areas from all 26 primary and 7 supplementary warehouses currently managed by PPHI Sindh.

When viewed in the above context, warehouse management – which takes place in all of the above warehouse, to one extent or another – suddenly becomes a critical component of the PPHI's supply chain of its medicines and logistics.

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March 2020

CHAPTER I: INTRODUCTION

1.1 Background:

PPHI Sindh, a not-for-profit organization, has been providing primary level health services in rural Sindh since 2007. In order to revitalize healthcare facilities, PPHI provides health services (such as: maternal, neonatal and child health (MNCH), family planning, general outpatient consultation, nutrition, immunization, laboratory and ambulances) through its widely distributed 1,174 healthcare facilities in 23 districts. For enhancing the spectrum of MNCH services, PPHI has upgraded more than 300 BHU into BHU Plus which provides services round the clock, i.e. 24/7 across all over Sindh. PPHI's healthcare structure consist of RHCs, BHUs, BHU Plus, MCHCs GDs, and USKs all under the management of District Office (DO) in each district, which in turn monitored by four Regional Offices. Each district has its own warehouse for storage of medicines and equipment required by their respective healthcare facilities (*Appendix 1: Distribution of PPHI Sindh's warehouse across Sindh*).

The main objective of establishing these warehouses is to enhance and improve the storage capacity of procured goods and function as a temporary holding facility, where they receive and forward district-level supply requisitions from healthcare facilities. This setup reduces inefficiencies in handling medical supplies, prevent expired medicines to reach healthcare facilities and act as a buffer against sudden change in supply from vendors and demand from healthcare facilities. Thus, when properly managed and appropriately stocked, these warehouses enable a consistent supply of medical commodities as they are required.

Since beginning, PPHI has taken professional and systematic approach to warehousing; recognizing its crucial role in delivery of healthcare services. Nevertheless, it has faced multitude

of challenges in doing so. Challenges like increase in variety of health commodities, demand for reducing processing time and inventory management.

1.2 Objectives:

It is important for PPHI warehouse management to have an overall plan for professional, reliable commodity handling and storage management. Based on this, we outlined following objective for this warehouse assessment:

- To identify strengths and weaknesses in current warehouse practices in following areas:
    - *Infrastructure planning,*
    - *Layout planning and operations efficiency,*
    - *Equipment,*
    - *Special storage requirements,*
    - *Inventory management,*
    - *Security & safety, and*
    - *Human resources.*
- To develop an action plan short - & long - term interventions, including infrastructure and human resource requirements required to improve the current status of PPHI's warehouses.

CHAPTER II: METHODOLOGY

This particular assessment employed census methodology to assess all of the warehouse managed by PPHI. Methodologically, a combination of qualitative and quantitative approaches of doing research, which has been commonly practiced in public health, was adopted to provide holistic situation of warehouses. According to (Mark et al., 2009) mixing qualitative and quantitative approaches gives the potential to cover each method's weaknesses with strengths from the other method.

2.1 Warehouse Assessment Team Composition & Training:

An eight-member team of M&E officers was created to perform this assessment exercise. These assessors were selected based on their experience of conducting routine M&E-based activities within their respective districts. Table 1 shows the distribution of the team members and their assigned districts for warehouse assessment.

Table 1: Details of team members and assigned districts

S. No	Data Assessors	District
1	Assessor # 1	Kashmore, Kamber, Shikarpur
2	Assessor # 2	Larkana, Dadu, Jacobabad
3	Assessor # 3	Hyderabad, Jamshoro, Matiari
4	Assessor # 4	Khairpur-A, Khairpur-B
5	Assessor # 5	N. Feroz, Sukkur, Ghotki
6	Assessor # 6	Badin-A, Badin-B, Mirpurkhas-A, Mirpurkhas-B
7	Assessor # 7	Tharparkar, Umerkot, Sanghar-A, Sanghar-B
8	Assessor # 8	Tando M. Khan, Tando Allahyar, Sujjawal, Thatta

Prior to field activity, a one-day training session was conducted for these assessors in order to orient them with the warehouse assessment tool, ODK application and clarify any questions that were raised about the tool. During this session, they were also trained for using electronic thermometer that was used to measure warehouse temperature.

2.2 Data Collection on Warehouse Assessment Tool:

For this warehouse assessment, we have adopted *The Warehouse Assessment Tool* that was developed by the USAID for their DELIVER PROJECT. This tool is a guide for collecting information on the functioning of specific aspects of a warehouse and to systematically record observations from warehouses. It provides both a quantitative and qualitative framework to perform a comprehensive assessment of the performance of a warehouse system for any health program managing any type of health commodities. The warehouse assessment tool (*Appendix 2*), is one mechanism for synthesizing data into a manageable number of questions that, together, present an overall picture of the warehousing system. The tool contains questions, and instructions on scoring; and summary boxes for strengths, weaknesses, and general highlights. Figure 1 shows the component of warehouse assessment tool kit.

Figure 1: Components of Warehouse Assessment Tool Kit

2.2.1 Section A - Warehouse Infrastructure Planning

Following are several areas of warehouse infrastructure and the attributes of a well-planned and successful warehouse that you should consider:

- Overall condition of the warehouse should be clean and tidy. Its walls, ceilings and flooring should be free of dust, cracks and leakage.
- Warehouse should have adequate lighting, provided that commodities are not directly exposed to the sunlight.
- If the main source of electricity is not reliable, installation of a solar panel or generator should be made available for alternative supply of electricity.
- Warehouse should be temperature and humidity monitored.

2.2.2 Section B - Layout Planning & Operations Efficiency:

This section overviews the performance of the warehouse in terms of number of days it is functional, frequency of supply in & out, and adequate spacing for lodging and dispatching commodities. Figure 2 depicts the layout for the receiving/shipping activities of a typical warehouse. It shows a warehouse where trucks dock at a 90° angle; it has four separate dock levelers. There is one staging area on either side of the warehouse; the two areas are separated by an access aisle. It also looks in to how well warehouse has utilizing the space.

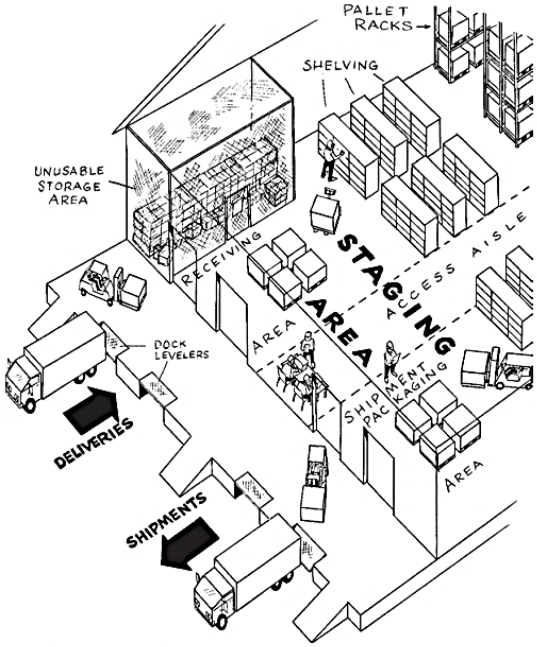


Figure 2: Typical layout of receiving and shipping activities

2.2.3 Section C - Warehouse Equipment:

Warehouse managers are responsible for all aspects of materials management, including a total systems approach to plan, acquire, store, move, and control the inventory of materials. To complete these essential warehouse operations, materials must be well-organized, including equipment, such as racking systems and material handling tools. The main justification for storage systems - pallet racks, shelving/bins, etc. - is to make optimum use of the warehouse space (figure 3). In addition to making optimum use of space, racking and shelving systems also provide simplicity and organization of materials and warehouse operations.

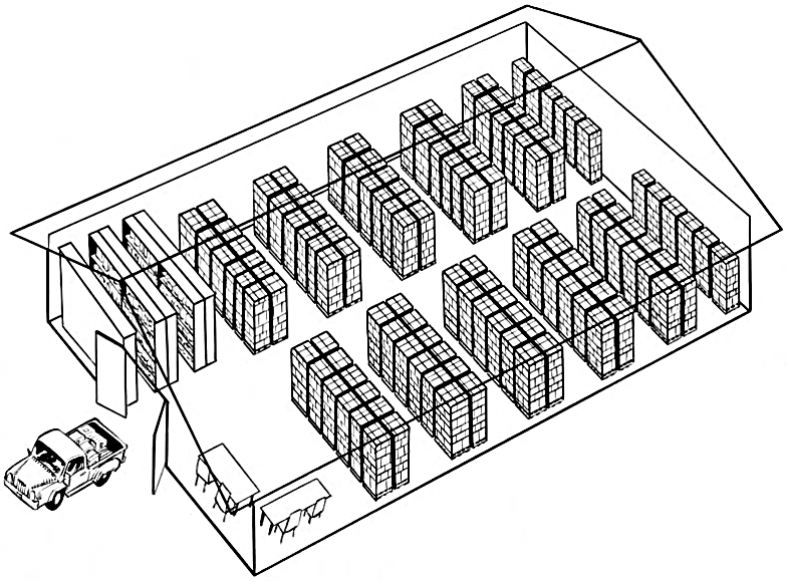


Figure 3: Sample layout for arranging pallet stacks and bin shelves

2.2.4 Section D - Special Storage Requirements:

In a typical warehouse, there are commodities that needs certain special storage requirements, such as some medicines and vaccines are needed to be placed in cold storage units with proper temperature regulation. Also, any flammable items (such as: anesthetics, alcohol etc.) should be stored in separate location away from general storage area. To prevent and control any fire accident, warehouse should have fire-fighting equipment ready to be used (section F).

2.2.5 Section E - Inventory Management:

Each warehouse should have an inventory management system to determine when to order products, how much to order, and how to maintain an appropriate stock level for all products to avoid shortages and oversupply. In general, there are two ways to manage inventory in a warehouse: *manually* and an *automated* system:

- ***Manual inventory management:*** Public health warehouses commonly use manual inventory systems, which are hand-written stock keeping records, such as ledgers, stock cards, and bin cards. A bin card is an individual stock keeping record that contains information about a single product, by lot or batch number, whereas an inventory control card is an individual stock keeping record that holds information about all the lots of a single product.
- ***Automated inventory management:*** As the quantity and volume of commodities increase, more and more warehouses are utilizing computerized warehouse management system (WMS) to keep the track of their inventory. These systems can be stand-alone software or a module within the organizational enterprise resource planning (ERP) system that includes the entire supply chain.

Another aspect of inventory management is *automated data collection (ADC)* that can be practical complement to computerized warehouse management. The ADC necessitates the warehouse to be equipped with barcode labels and scanners. This will eventually reduce the human errors, standardize the data collection and provide timely feedback.

2.2.6 Section - F Security & Safety:

Regarding security & safety, warehouse manager should have adequate procedures. Such as:

- Limiting access into the warehouse compound and the warehouse itself,
- Fencing, or a perimeter wall topped with wire, should be used to surround the compound.
- Security guards at the entrances are also advisable.
- Having a guest/visitor registration book will also help track who is coming and going.
- To prevent and control fire accident, installation of smoke detector and firefighting equipment (fire extinguisher and/ or sand buckets) are recommended.
- It is also necessary that warehouse staff should be well trained to use equipment and warehouse manager should make sure that the staff routinely use personal protection equipment (PPE).

2.2.7 Section G - Human Resources:

While space and equipment are essential for the management of the warehouse, having well-trained staff with the appropriate knowledge and skills is the most critical factor in determining whether the given warehouse is productive or not.

- Each warehouse should implement standard operating procedure (SOP) for all functions and processes.
- Newly recruited staff for the warehouse should have an orientation with regular on-job training opportunity.

Apart of above seven components, data was also collected for basic information of warehouse (such as: ownership status and GPS coordinates) and store manager's age, gender, educational

status, year of experience and whether they have taken any specific qualification in warehouse management.

2.3 Data Management & Analysis

After in-house review of the warehouse assessment tool, the tool was deployed on ODK, an android-based application, for the data collection procedure. In addition to this, images were also captured to portray pictorial evidence of warehouse condition. This method of data capturing was adopted in a spirit of data triangulation.

For each component, a score was calculated based on the items within the component. A percent score was then calculated to standardized the comparison across all the components for each warehouse. To assess the warehouse temperature, an absolute difference between the warehouse and calibrated thermometer was calculated and score was assigned if the absolute difference is less than 2 SD of absolute difference. For qualitative data, data was thoroughly reviewed for each warehouse to obtain general observations about warehouse practices, strengths and weaknesses that currently exists.

CHAPTER III: RESULTS OF WAREHOUSE ASSESSMENT

3.1 Overall results:

Following findings are a summary and apply to all warehouses. PPHI Sindh has 26 primary warehouses associated with each District Office. Whereas, warehouses in district Tando Allah Yar, Sanghar A, Jacobabad, Tharparkar and Ghotki have acquired additional space outside main warehouse for storage purpose. Of all main warehouses, PPHI owns 9 warehouse facilities while rest of the warehouses are on the rented premises (n = 17) (figure 4a & 4b). Table 2 shows the demographic information of store managers. Therefore, until further notice store assistant is performing the duties of store manager.

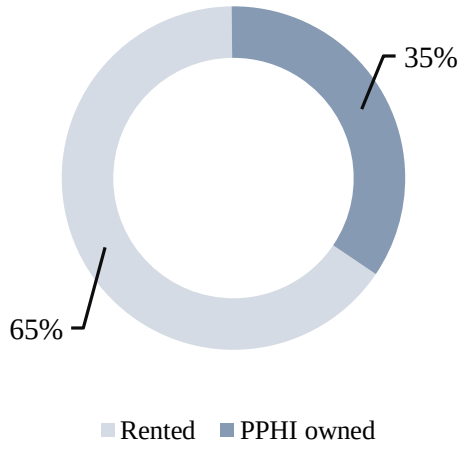


Figure 4a: Overall ownership status of PPHI warehouses (n = 26)

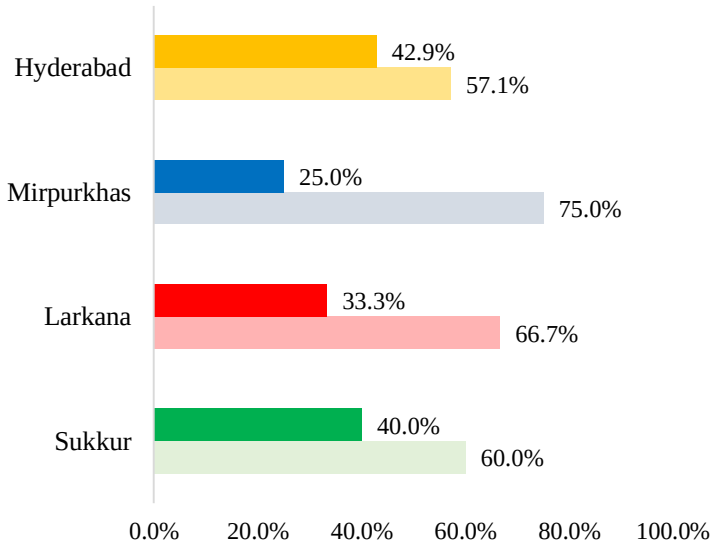


Figure 4b: Region wise ownership status of PPHI warehouses (n = 26)

Dark shade: PPHI owned
Light shade: Rented

Table 2: Demographic profile of store managers of PPHI warehouses

Characteristics		Hyderabad	Mirpurkhas	Larkana % (n)	Sukkur	Total
Gender	Male	100.0 (7)	87.5 (7)	100.0 (6)	100.0 (5)	96.2 (25)
	Female	0.0 (0)	12.5 (1)	0.0 (0)	0.0 (0)	3.8 (1)
Age	< 30 years	14.3 (1)	12.5 (1)	16.7 (1)	20.0 (1)	15.4 (4)
	30 – 39 years	42.9 (3)	87.5 (7)	83.3 (5)	80.0 (4)	73.1 (19)
	≥ 40 years	42.6 (3)	0.0 (0)	0.0 (0)	0.0 (0)	11.5 (3)
Educational status	Graduate	85.7 (6)	100.0 (8)	83.3 (5)	80.0 (4)	88.5 (23)
	Post graduate	14.3 (1)	0.0 (0)	16.7 (1)	20.0 (1)	11.5 (3)
Working experience	≤ 1 year	14.3 (1)	37.5 (3)	16.7 (1)	0.0 (0)	19.2 (5)
	2 – 5 years	14.3 (1)	50.0 (4)	33.3 (2)	40.0 (2)	34.6 (9)
	6 – 9 years	28.6 (2)	0.0 (0)	16.7 (1)	40.0 (2)	19.2 (5)
	≥ 10 years	42.9 (3)	12.5 (1)	33.3 (2)	20.0 (1)	26.9 (7)
Qualification in warehouse management	Yes	28.5 (2)	0.0 (0)	16.6 (1)	20 (1)	15.4 (4)
	No	71.5 (5)	100.0 (8)	83.4 (5)	80 (4)	84.6 (22)

3.1.1 Section A – Warehouse Infrastructure Planning:

As described above, section A assessed the warehouse infrastructure in terms of its cleanliness, condition of its wall, ceiling and floor. In general, infrastructure of some warehouse needs an urgent repair and renovation. It was observed that nearly half of the warehouses did not have proper tidiness, but almost 85% of the warehouses had good condition of its ceiling, walls and floor. Nevertheless, five warehouses (19.2%) from Mirpurkhas region showed staining on walls indicating a leakage. In terms of the condition of floors, 15.4% of the warehouses across all four regions are not in a good condition (i.e., floor having either molds, holes, or being unleveled). Another major concern that was reported in the data was of improper lightening system and few

of the warehouses had non-functional light bulbs. Meanwhile warehouse managers have made sure that commodities are not directly exposed to the sunlight.

Regarding temperature maintenance, nearly 77% of the warehouses have air-conditioned installed but only one third of them are running round the clock.

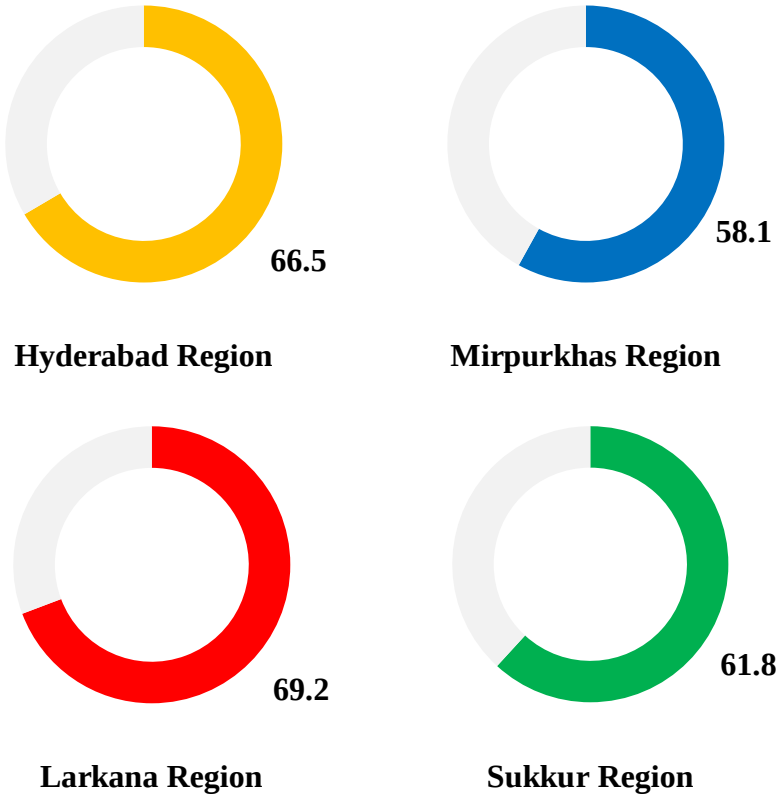


Figure 5: Region wise percent score distribution of section A (warehouse infrastructure planning)

To monitor temperature fluctuation, warehouses have thermometer placed inside the facility but only one half is maintaining temperature chart. Two-third of all the warehouses reported to have interruption in the main electric supply. This possess major challenge in smooth functioning of the warehouse. Figure 5 shows region wise percent score distribution of section A. Warehouses from Larkana region appeared to be relatively in better situation as compared to the warehouses from other regions. It should be noted from figure 6 that there is a high heterogeneity in the distribution of percent score of section A across all the regions. Warehouses from districts such as Hyderabad, Tharparkar, Naushehro Feroze, Kashmore, and Jacobabad had relatively better percent score as compared to warehouses from other districts. Notably, warehouses from district Ghotki, Sanghar – A, Mirpurkhas – A, Badin – B, Tando Allah Yar, and Tando Mohammed Khan demonstrated poorest percent score.

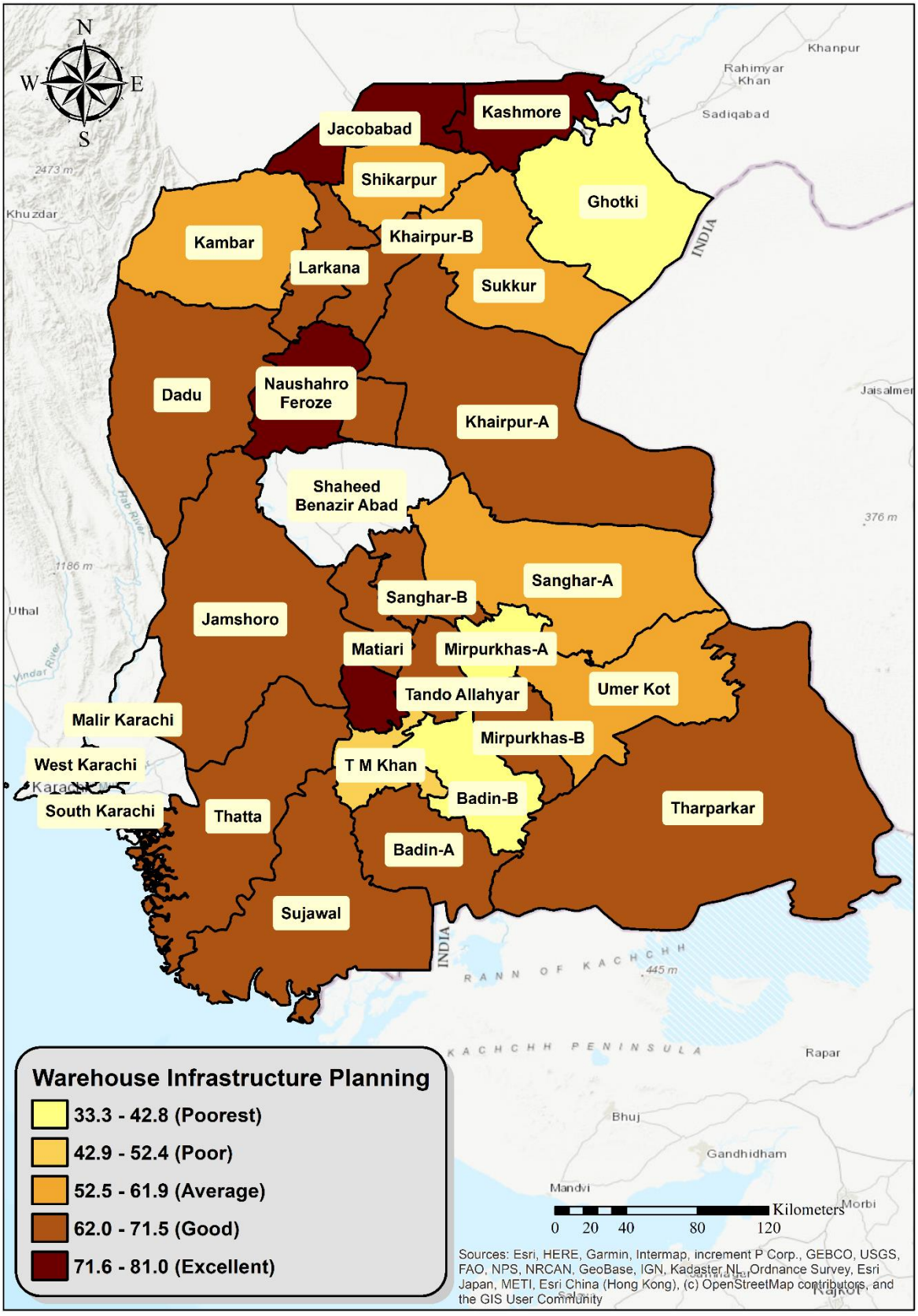


Figure 6: Distribution of percent score of section A (warehouse infrastructure planning) across Sindh

3.1.2 Section B - Layout Planning & Operations Efficiency:

Figure 7 depicts region wise percent score distribution of section B (layout planning & operation efficiency). For this section as well, warehouses from Larkana region have relatively better average score in comparison to the warehouses from other three regions, especially in comparison to Hyderabad region. All of the districts are running their warehouses for six days a week except district Jacobabad, where store manager reported to run warehouse for five days a week. For each quarter, receiving/ shipping processes throughout all warehouses are adequate enough to provide managed control of the existing demand levels from healthcare facilities. There were only 38.5% of the warehouses in which vehicle have direct access to loading/ receiving bay, whereas for rest of the 61.5% of the warehouses have to manually carry the commodities inside the warehouse. This results in a labor-intensive operation where warehouse staff have to manually offload shipments carton by carton. This additional manual operation may result in damage of goods. In terms of arranging commodities properly (i.e.

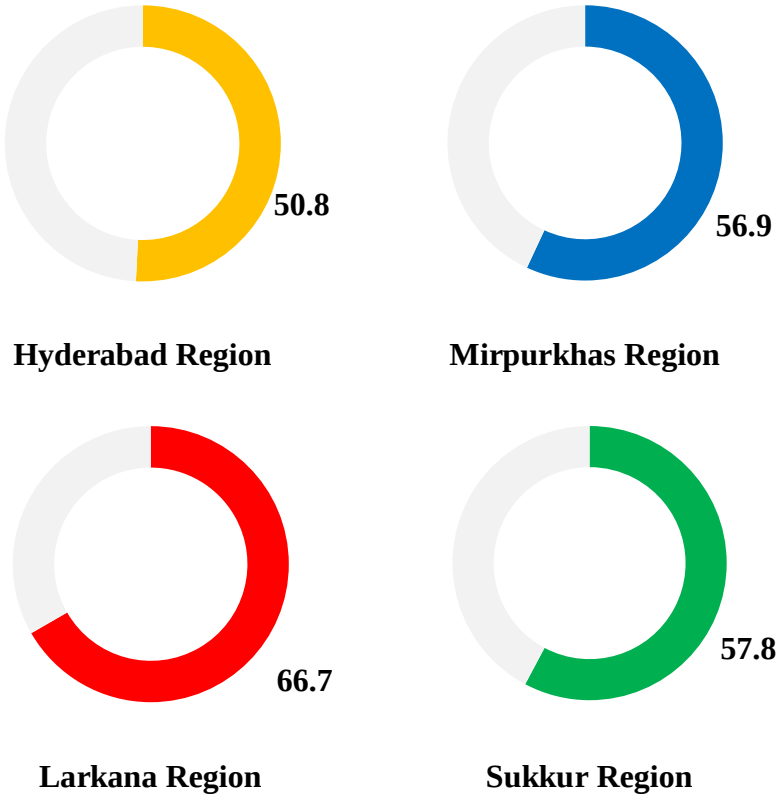


Figure 7: Region wise percent score distribution of section B (layout planning & operation efficiency)

aisles between the stacked pallets or racking clear of stored commodities), only 65.4% of the warehouses showed to able to maintain their commodities properly. In addition, most warehouse had limited or even no working space dedicated to picking, sorting, packing, and dispatch. This restricts the use of appropriate tools, such as order assembly tables or packaging material that can help make the order fulfillment processes easier and more accurate and will prevent damage to commodities It is worth to note that more than 70% of the warehouses have severe shortage of space to manage their logistics within and thus they have arranged an extra storage capacity in other rented premises or in most of the cases, within DO offices. Figure 8 shows district wise distribution of percent score reflecting varying distribution. It is evident that districts Kambar, Larkana, Dadu, Naushehro Feroze, Jamshoro, Badin B, Sanghar A and Tharparkar have percent scores within the highest quantile.

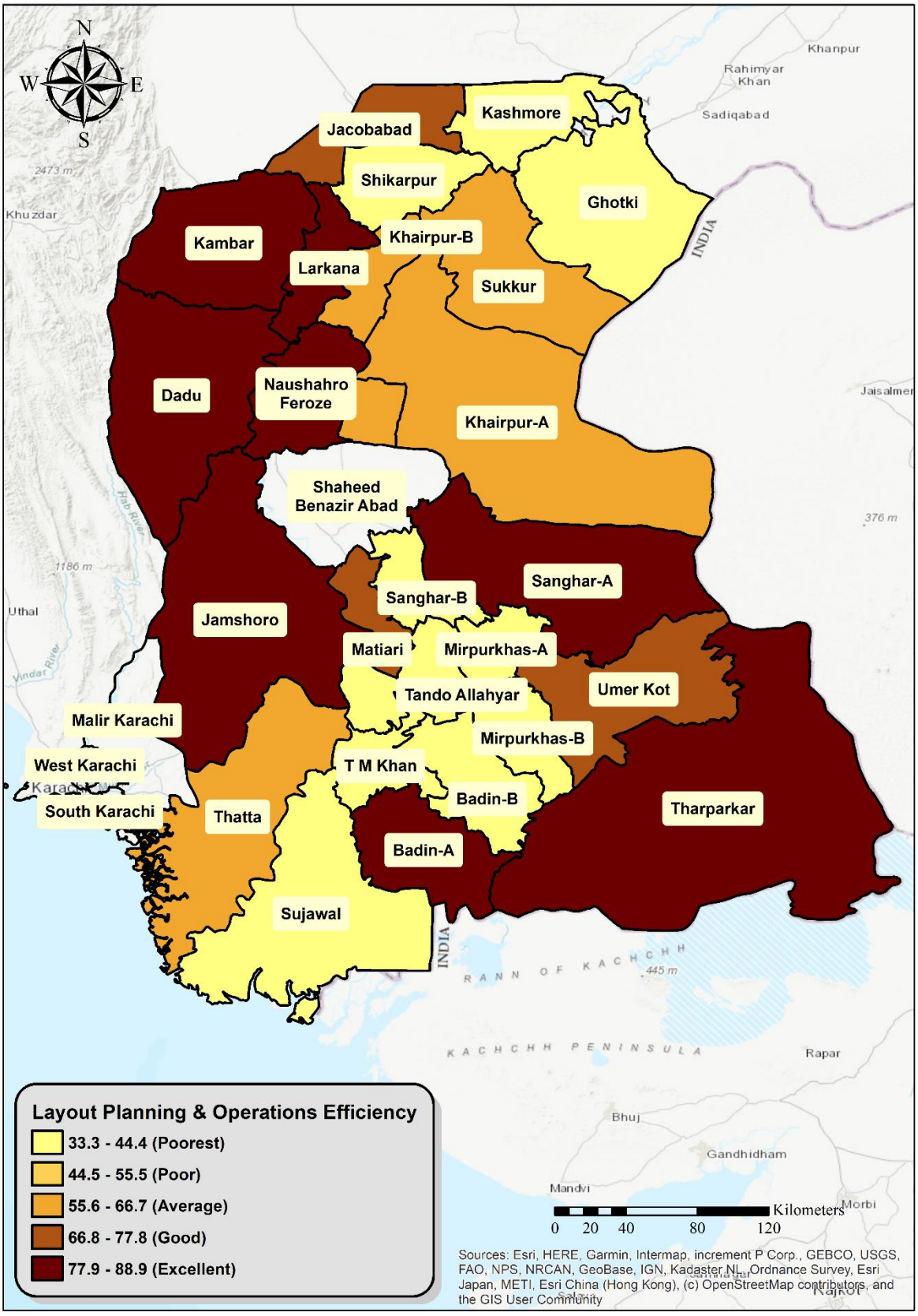


Figure 8: Distribution of percent score of section B (inventory planning & operation efficiency) across Sindh

3.1.3 Section C - Warehouse Equipment:

Figure 9 depicts region wise percent score distribution of section for the warehouse equipment. The mean percent score of Larkana region had highest score. Whereas, Sukkur region had lowest percent score suggesting immediate attention should be paid in terms of its management of warehouse equipment. This includes provision of sufficient pallets, pallet jacks, and shelves. It was also observed that in warehouses from all regions, there is insufficient space between aisles. Another important aspect in the management of commodities is whether the condition of cartons is good. It is observed that in warehouse from Hyderabad and Mirpurkhas regions, cartons were poorly stacked causing them to crush. These damaged cartons can pose serious hazard to the stored commodities. From figure 10, it is evident that districts within Sukkur region have score in the lowest two quantiles of the distribution of percent score.

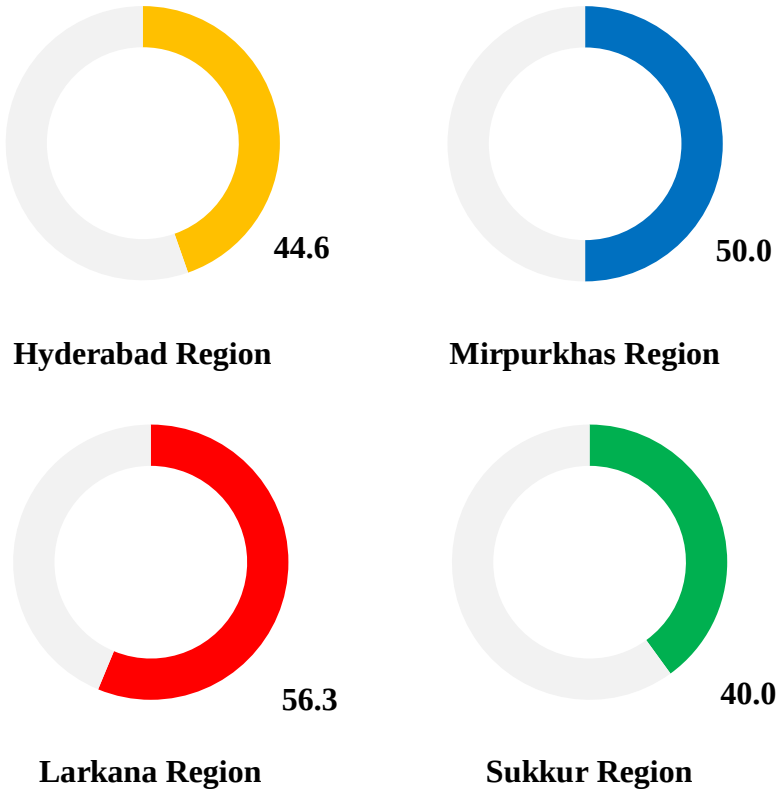


Figure 9: Region wise percent score distribution of section C (warehouse equipment)

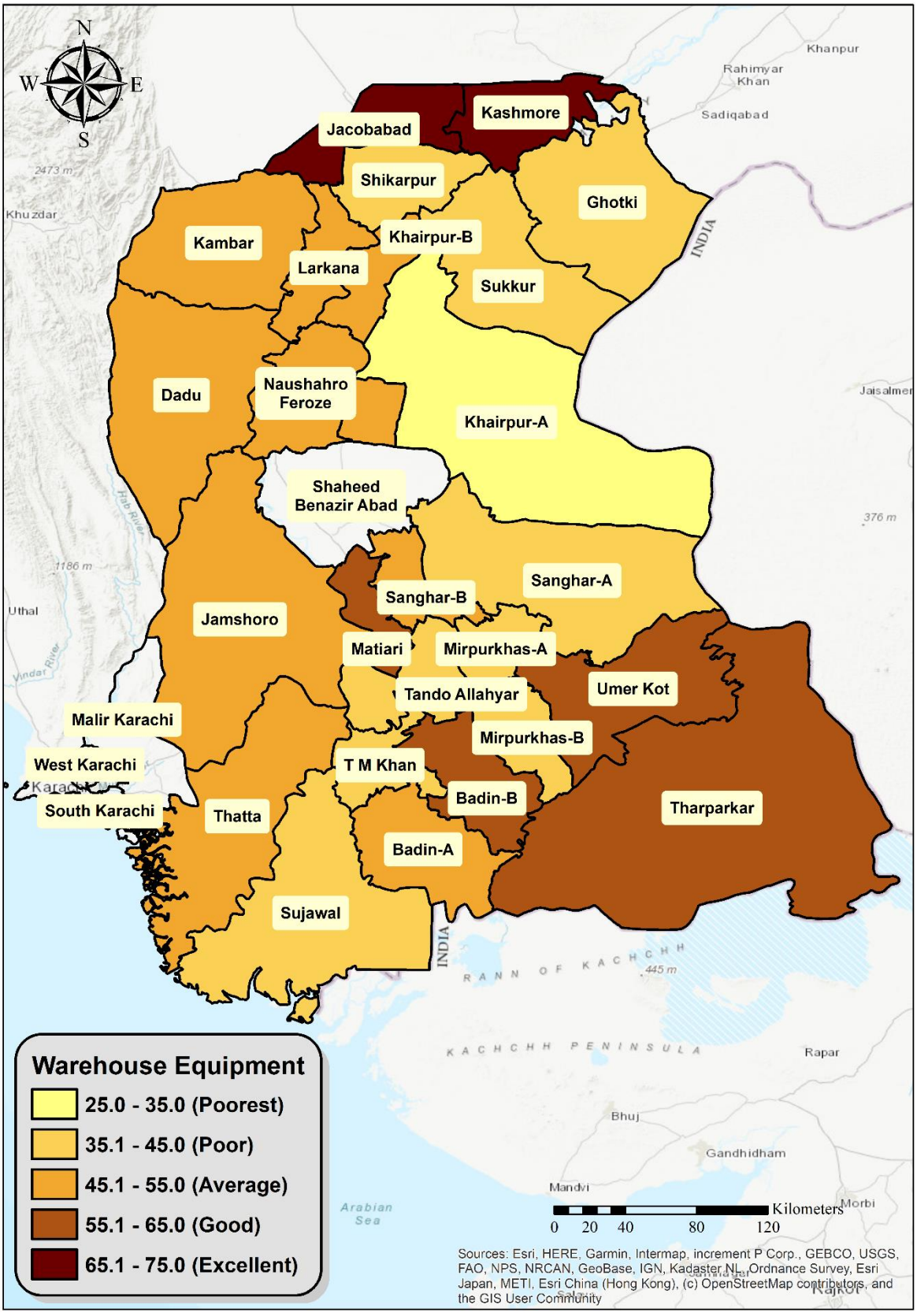


Figure 10: Distribution of percent score of section C (warehouse equipment) across Sindh

3.1.4 Section D - Special Storage Requirements:

In this section, we assessed the management for commodities to be stored in a special storage unit. We found that nearly 20% (n = 5) of the warehouses do not have commodities that needs cold storage unit. In rest of the warehouses (n = 21), only 52.4% have specified cold storage unit and only in 10 warehouses these cold storage units have means to monitor temperature. For flammable items, majority of the warehouses (80%) do not have separate designated space rather they are kept along with medicinal commodities. Region-wise, Mirpurkhas region scored lowest in this section as compared to other regions (figure 11). In figure 12, district wise distribution of score for the section D can be seen where districts Jacobabad, Tharparkar and Badin – B have poorest score and Umer Kot, Sukkur, Shikarpur, Kambar and Dadu districts achieved highest scores.

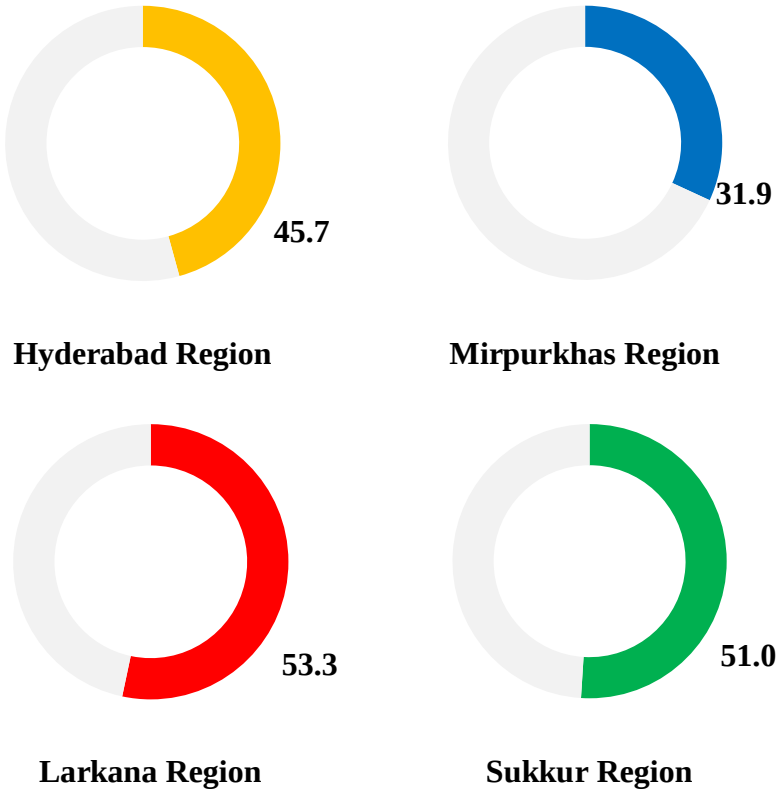


Figure 11: Region wise percent score distribution of section D (special storage requirements)

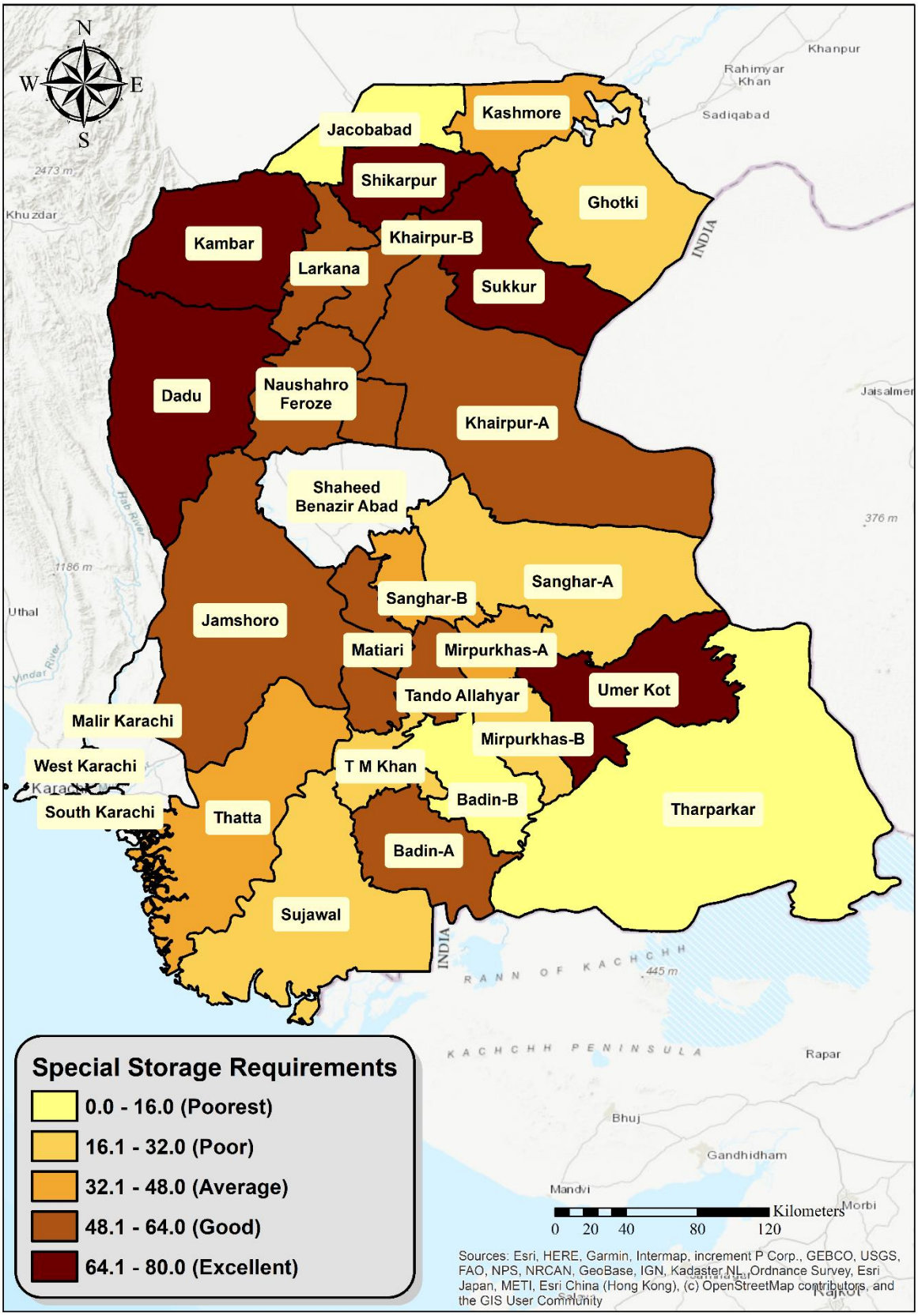


Figure 12: Distribution of percent score of section D (special storage requirements) across Sindh

3.1.5 Section E - Inventory Management:

Generally, there are two ways to manage inventory in a warehouse; manually and an automated system. The essential element here is to have a mechanism for documentation of financial transactions. PPHI Sindh is currently utilizing both types of inventory management system. Using manual system, information of commodities is stored in bin cards and store ledgers. It must be noted that in around 23% of the warehouses are not maintaining bin cards. Warehouse managers perform full physical inventory stock counts on monthly basis. Whereas, in 31% of warehouses, ledgers are not maintained up to date. Regarding documentation for expired medicines, 69% of the warehouses reported to have written documentation out of which only 14 (78%) of the warehouses could show the proper documents for expired medicines. Figure 13 depicts overall score for the section, in which Larkana region show highest score followed by Mirpurkhas region. Figure 14 reflects similar picture as majority of the districts within these two regions have scores in excellent category.

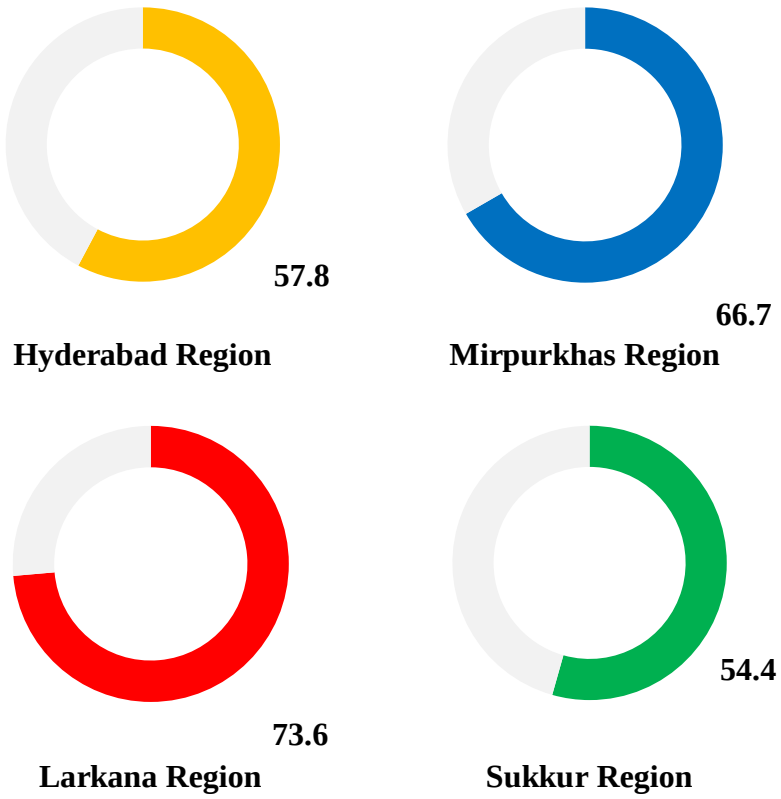


Figure 13: Region wise percent score distribution of section E (inventory managment)

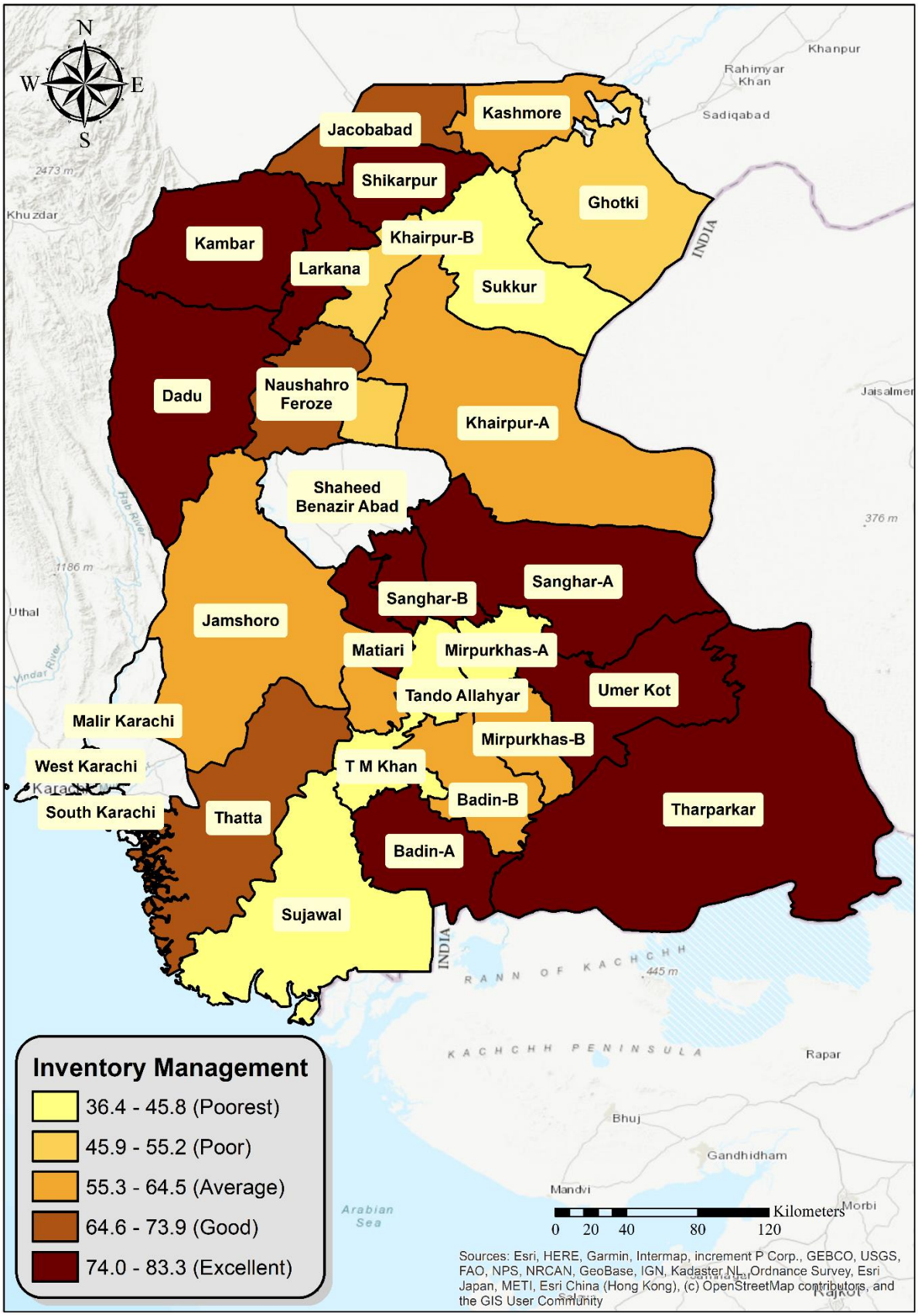


Figure 14: Distribution of percent score of section E (inventory management) across Sindh

3.1.6 Section F - Security & Safety:

In terms of secured surrounding of the warehouses, only 73% have walls secured with high walls and fence. Whereas, 61.5% of the warehouses have CCTV installed that can monitor activities within and around the warehouses. It should be noted that there are three warehouses (11.5%) where access to warehouse is not restricted to designated personals and 77% warehouses where there is no documented mechanism to record entry and exit from the warehouse. For rest of the 23% of the warehouse where they reported to have such mechanism, only half of them could show entry/ exit logbook. Firefighting equipment is available in all warehouses, but only 65% of the warehouses have fire extinguishers that had valid date. Furthermore, 65% had functional smoke detectors installed. Figure 15 demonstrate that all four regions have similar scores for this section. Whereas, figure 16 shows only district Naushehro Feroze have highest score in terms of security and safety as compared to other districts.

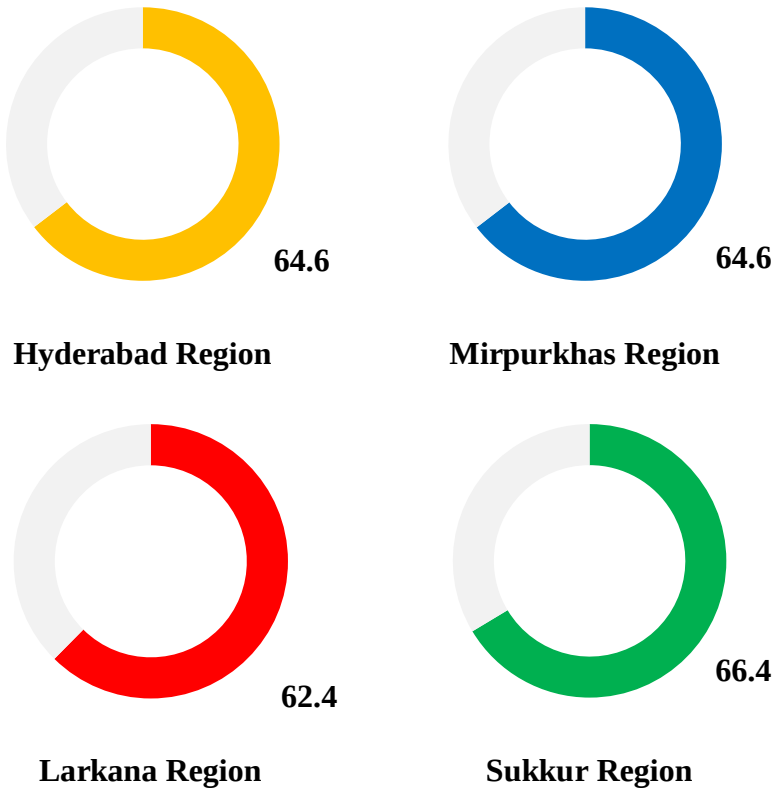


Figure 15: Region wise percent score distribution of section F (security and safety)

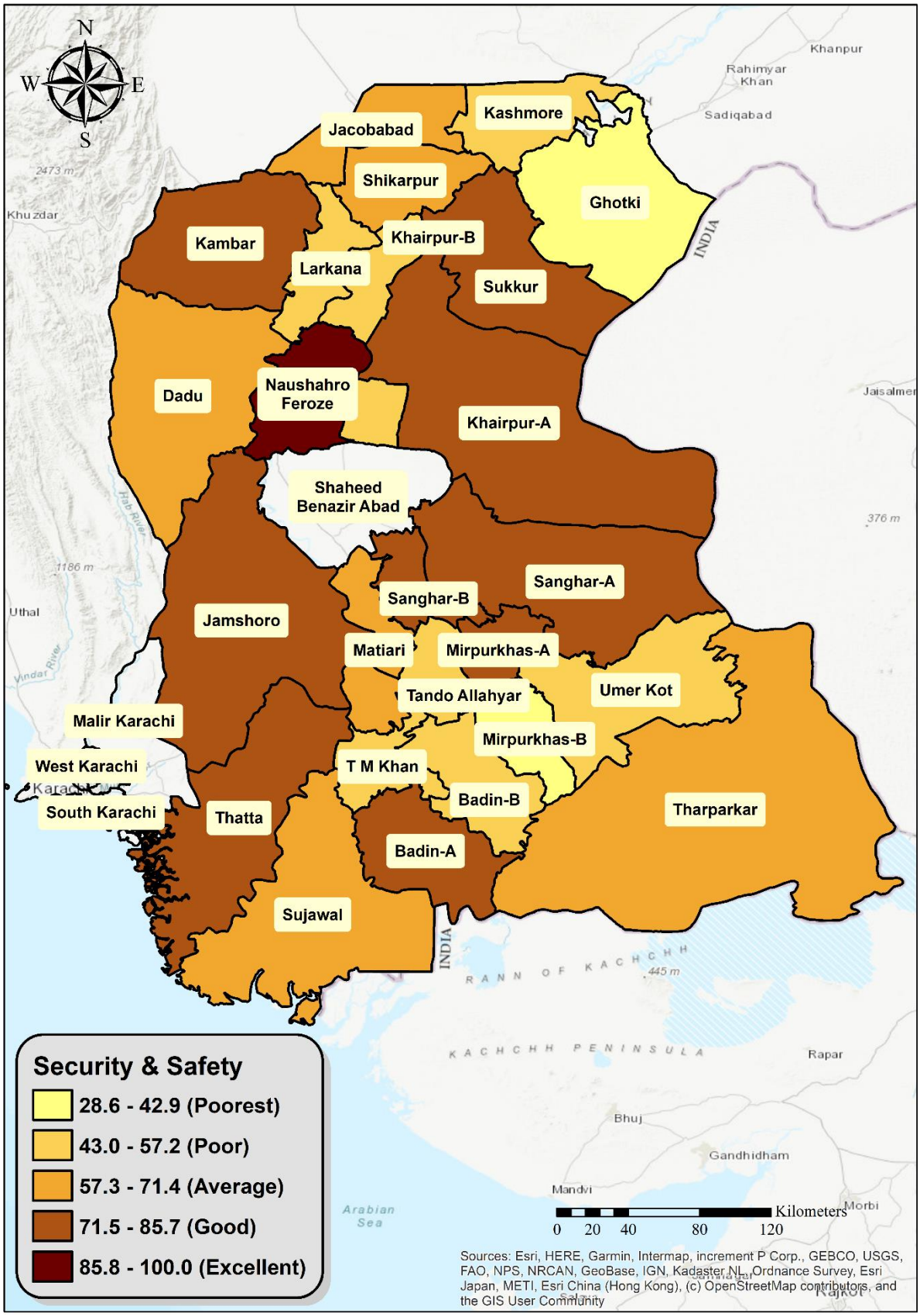


Figure 16: Distribution of percent score of section F (security and safety) across Sindh

3.1.7 Section G - Human Resources:

Figure 17 shows overall score distribution, with highest score attained by Larkana region. While figure 18 demonstrate district wise score distribution. We found that all of the warehouses have one store manager but 80% of the warehouses have assistant store manager and 27% of the warehouses have less than three medicine handlers.

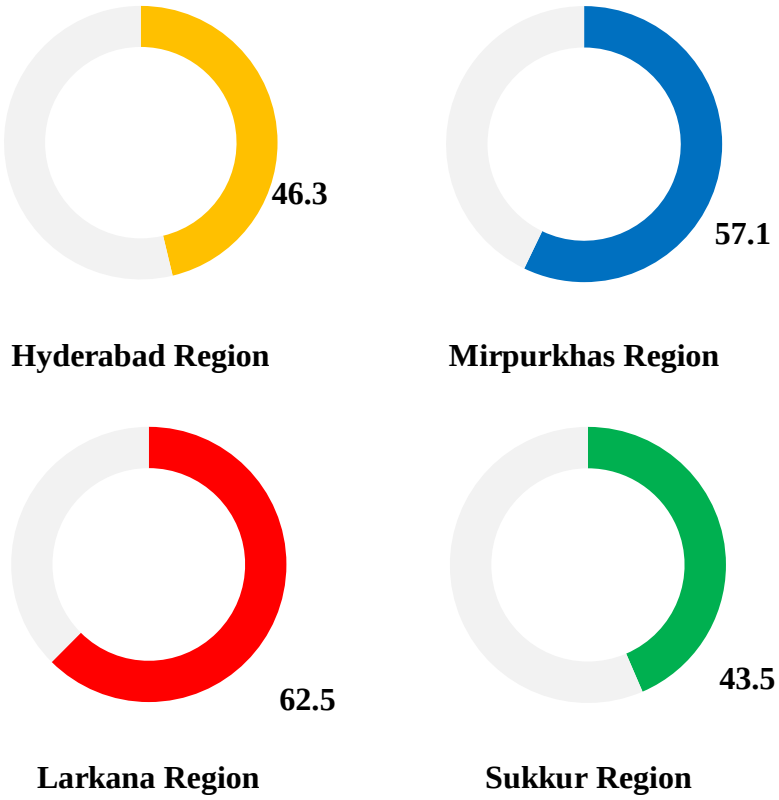


Figure 17: Region wise percent score distribution of section G (human resourse)

Whereas, 11.5% of the warehouses reported to have insufficient warehouse staff to oversee warehouse management. Only one warehouse has warehouse organogram displayed on the wall and only 2 (7.7%) have posted job description. Regarding knowledge assessment, frequency distribution of respondents are as follows:

Statements asked:	Percentage of correct response
Recommended type of flow of medical supplies is first expire – first out (FEFO)	80.8%
Recommended temperature threshold for medicines with instruction: "store in dry and well-ventilated place" is 30^0C	92.3%
Correct definition of inventory card	11.5%
Correct definition of bin card	15.4%

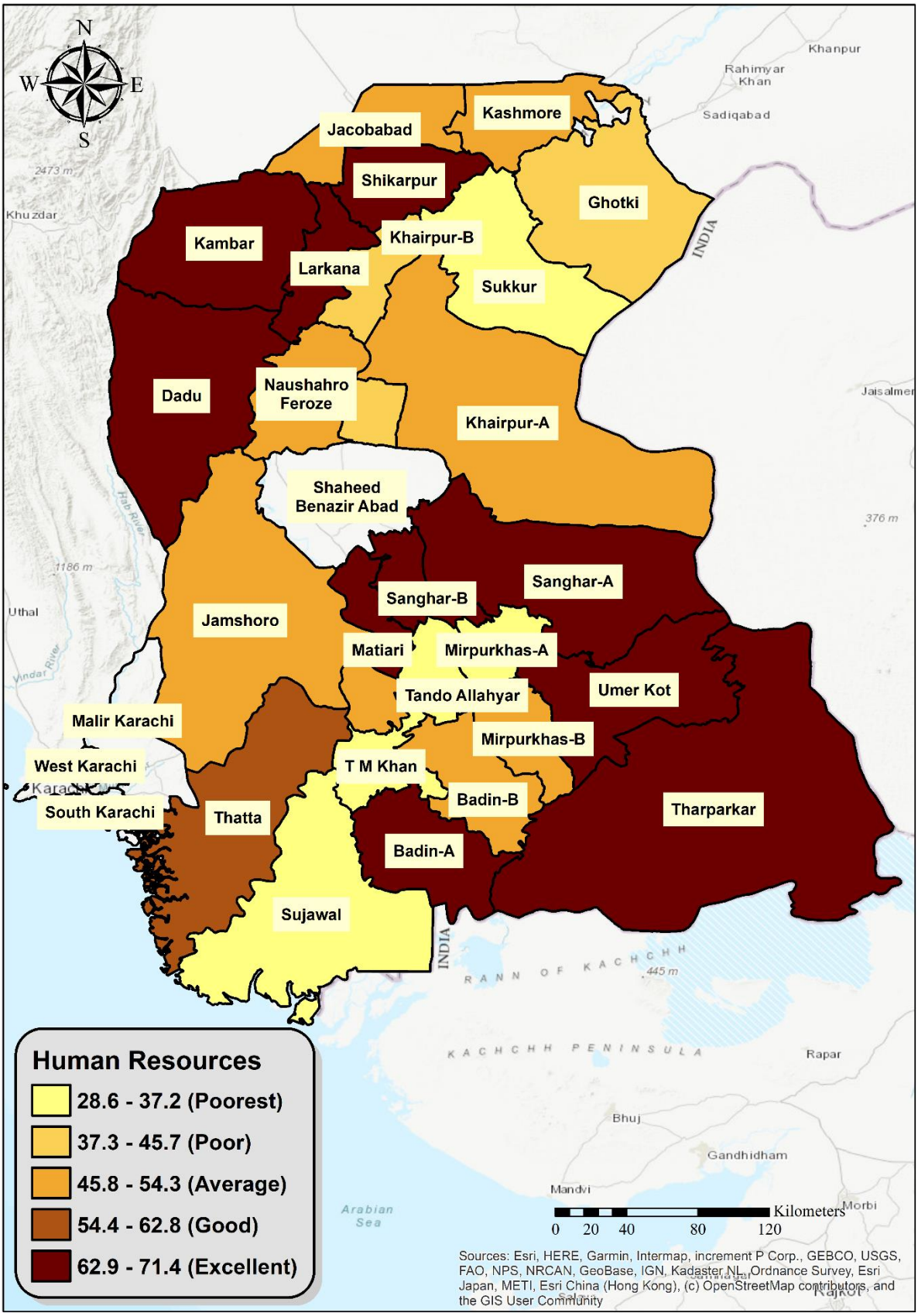
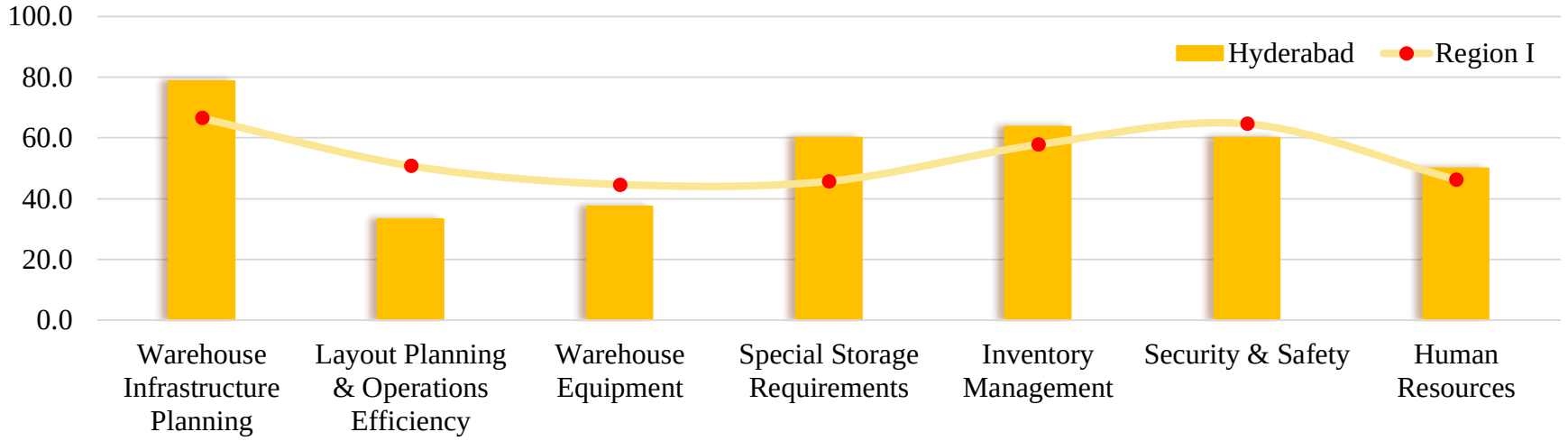


Figure 18: Distribution of percent score of section G (human resources) across Sindh

3.2 District – wise Results

Hyderabad

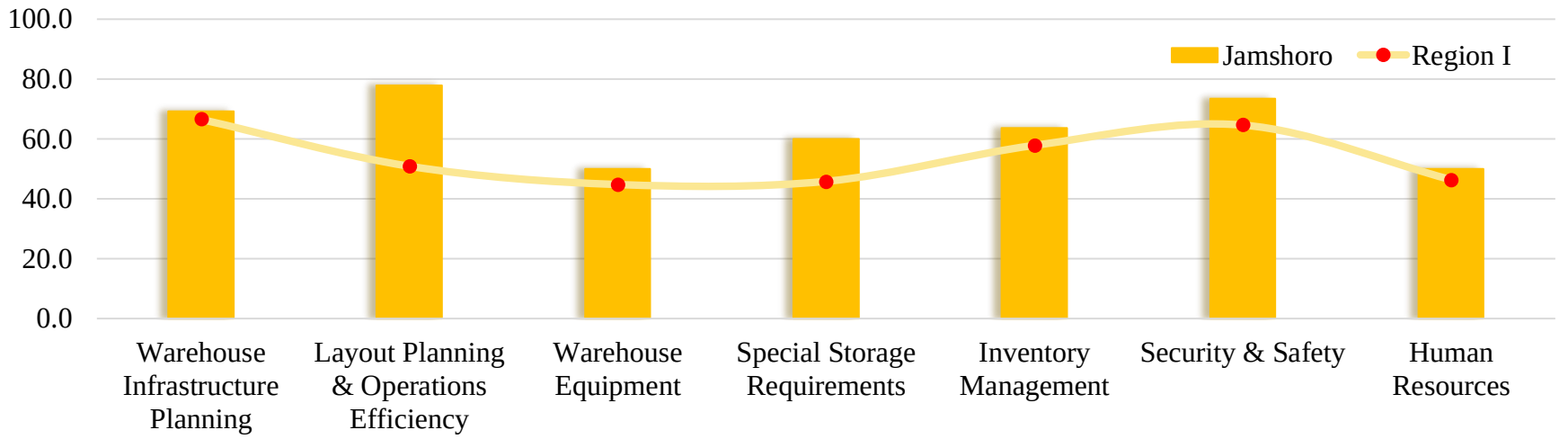


Highlights:

- Shortage of space
- Availability of standby generator
- Commodities are not properly labelled
- Expired commodities need to be placed separately
- Passage between aisle should not be used to store commodities
- Inventory is being well maintained
- Availability of Personal Protective Equipment (PPE) PPE

Figure 19: Snaps from the warehouse of district Hyderabad

Jamshoro

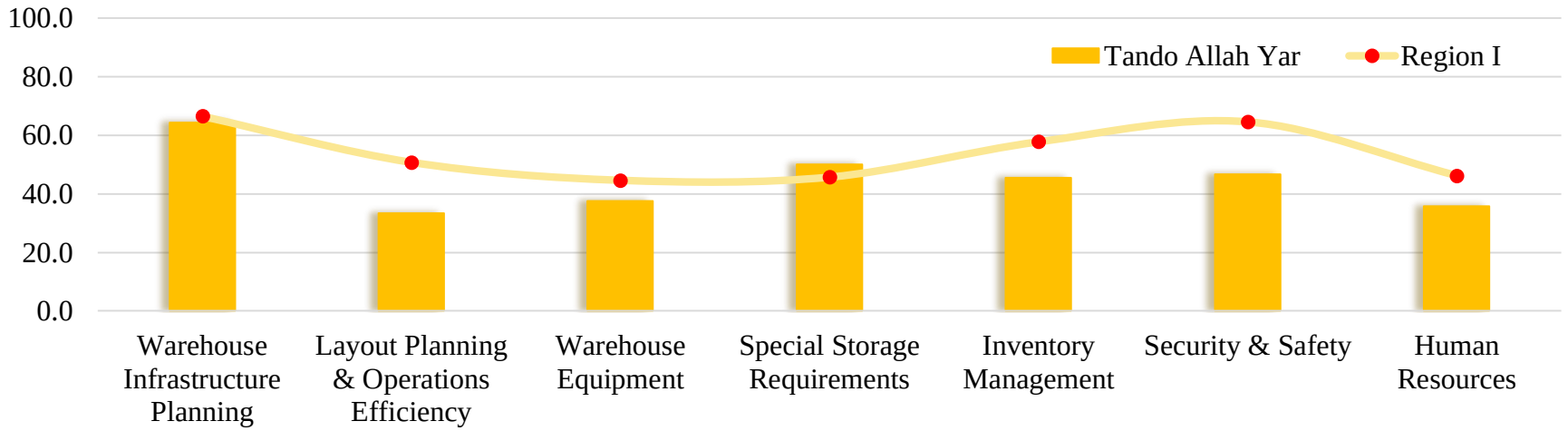


Highlights:

- 80% of the warehouse space has been occupied with the commodities causing severe shortage of space
- Commodities are stacked up to the roof affecting boxes underneath
- Manages expired commodities properly
- Urgently needs to have functional smoke detectors for prevent fire emergencies

Figure 20: Snaps from the warehouse of district Jamshoro

Tando Allah Yar

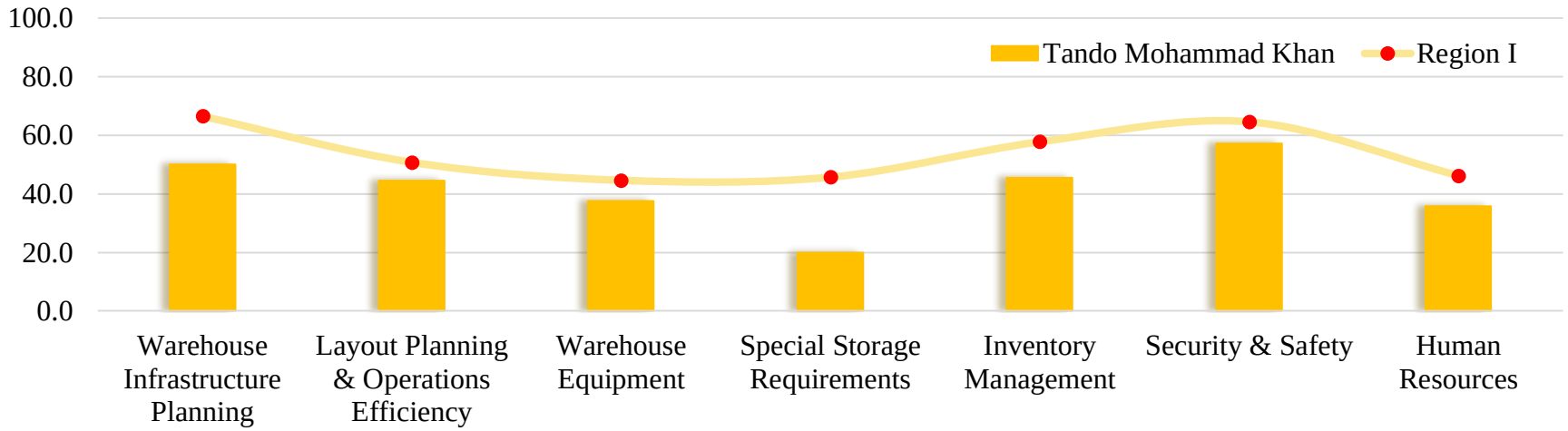


Highlights:

- Main warehouse is located in DO, but due to shortage of space an extra space has been rented out.
- Commodities are not properly placed
- Different types of medicines are placed on same pallet
- Poor maintenance of commodities at additional warehouse space, such as inadequate lightening
- Inventory record needs to be up to date

Figure 21: Snaps from the warehouse of district Tando Allah Yar

Tando Mohammad Khan

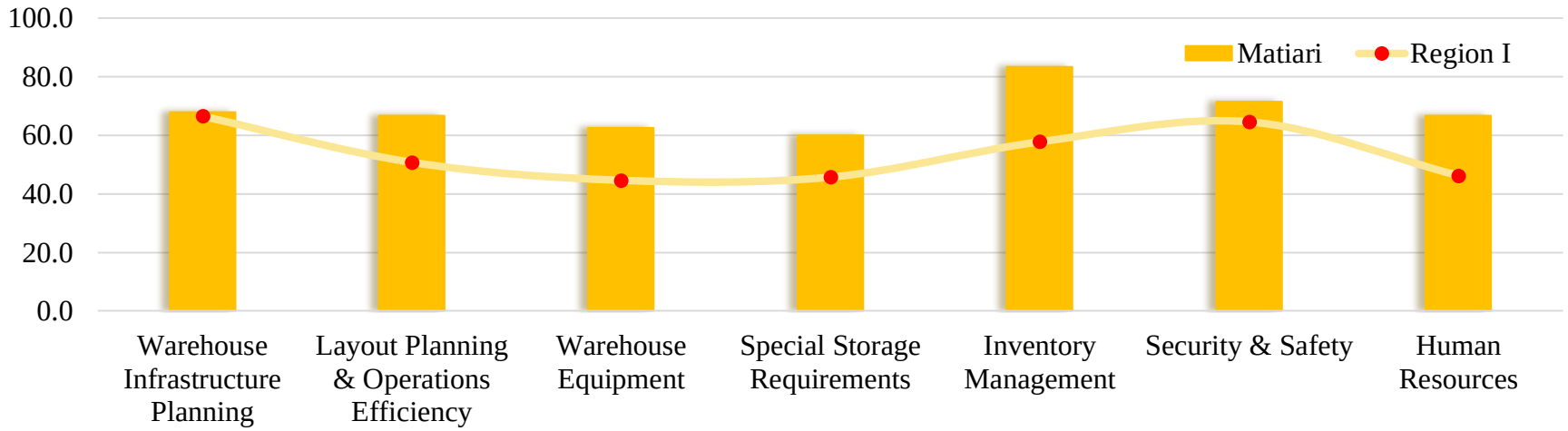


Highlights:

- Not all parts of the warehouse have air-conditioners and temperature record sheet is not maintained
- Portion of floor requires urgent repair
- Different types of medicines are placed on same pallet
- Incomplete ledgers
- Fire extinguishers was expired and needs to be replaced

Figure 22: Snaps from the warehouse of district Tando Mohammad Khan

Matiari

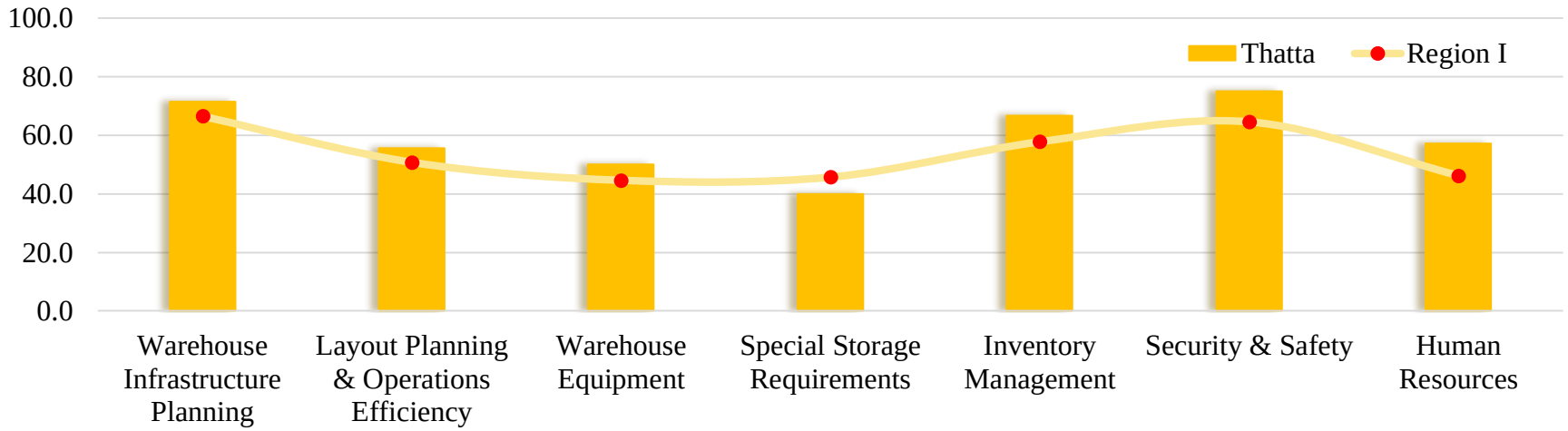


Highlights:

- Temperature chart was not maintained
- No separate space was allocated for damaged goods
- Different areas of the warehouse need repair and maintenance
- For security purpose, warehouse should have security CCTV installed
- Delivery vehicle do not have access to the receiving/ loading point as space was being used for parking

Figure 23: Snaps from the warehouse of district Matiari

Thatta

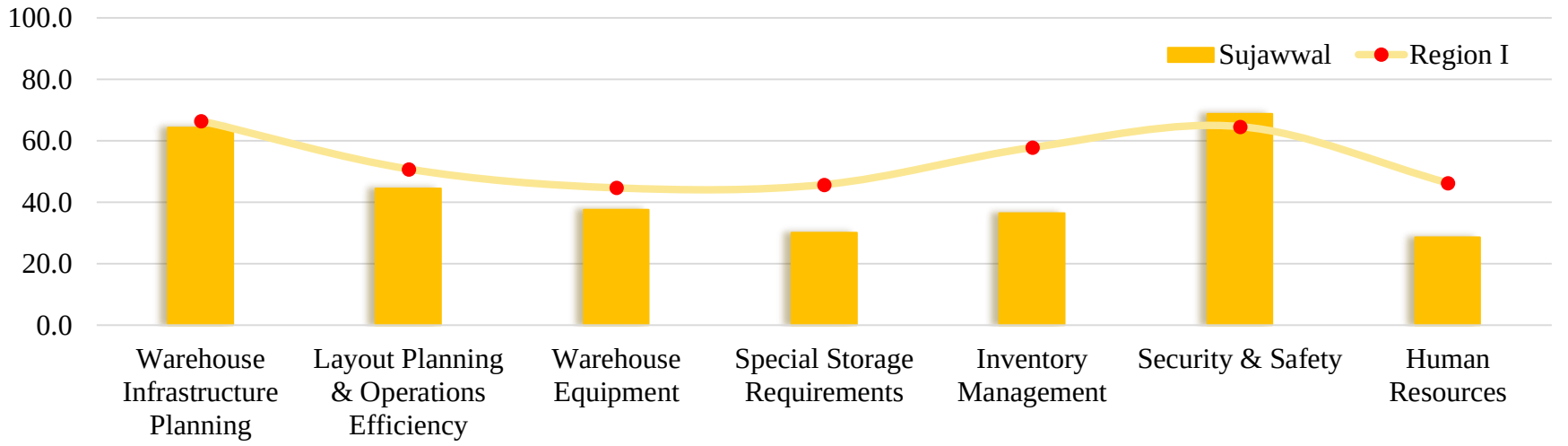


Highlights:

- Cold chain unit is out of order
- Incomplete ledgers
- Broken cartons were observed
- No mechanism was placed in for expired medicine
- Non medicinal commodities were placed with other commodities

Figure 24: Snaps from the warehouse of district Thatta

Sujjawal

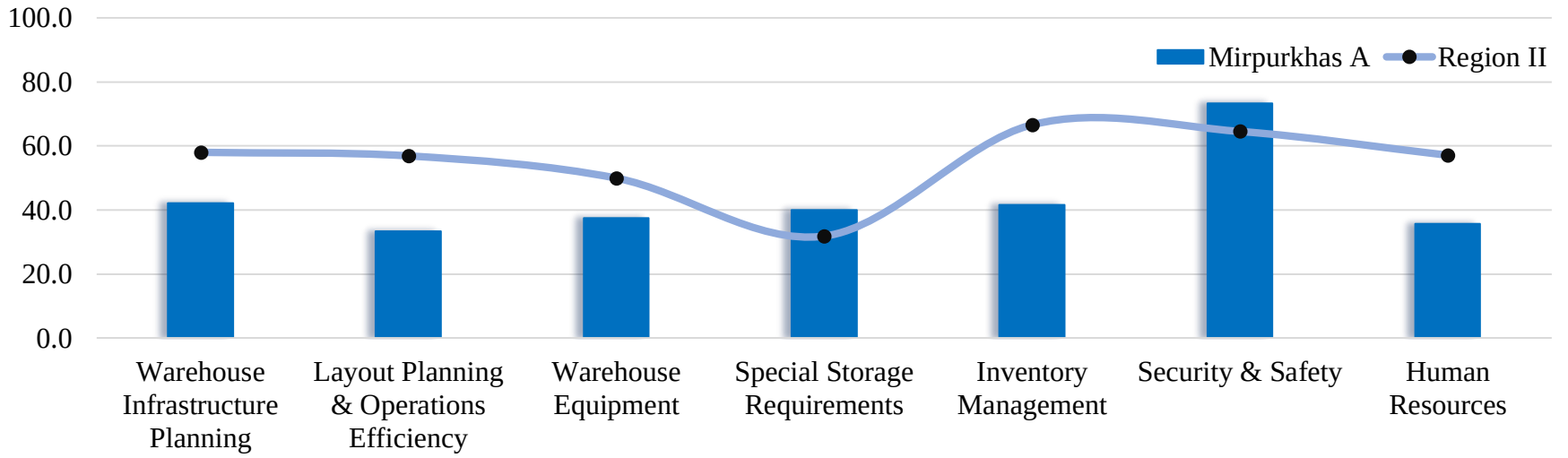


Highlights:

- This warehouse is located within the building of the warehouse of district Thatta
- Both of the warehouses share generator as a back-up electricity supply
- Labor trolley is being used to transfer commodities from the receiving/ loading bay
- Broken cartons were observed
- Large quantities of injection oxytocin are stored outside cold storage unit
- Fire extinguishers and fire buckets are being shared with the warehouse of Thatta district

Figure 25: Snaps from the warehouse of district Sujjawal

Mirpurkhas A

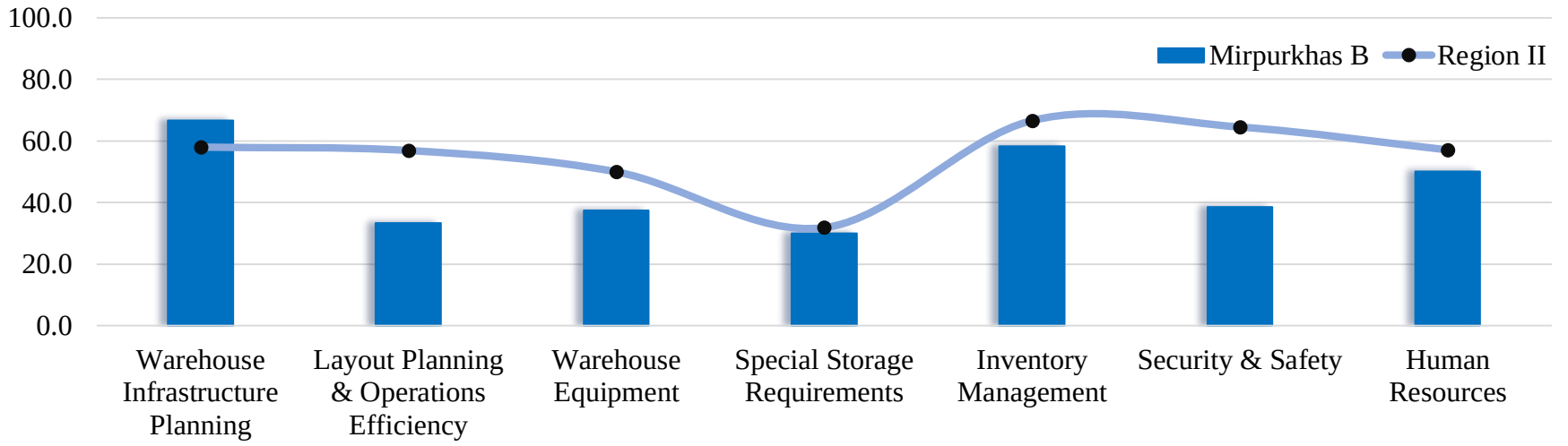


Highlights:

- This warehouse does not have air conditioners and generator or back up source of electricity
- An overall condition of this warehouse is not clean and tidy
- Like many other warehouses, this warehouse does not provide direct access for vehicle for loading & receiving purpose
- Severe shortage of space, improvement required for better utilization of space
- Bin cards are not available and ledgers are up to date. Commodities are not organized as FEFO but store manager reported that FEFO is being practiced

Figure 26: Snaps from the warehouse of district Mirpurkhas A

Mirpurkhas B

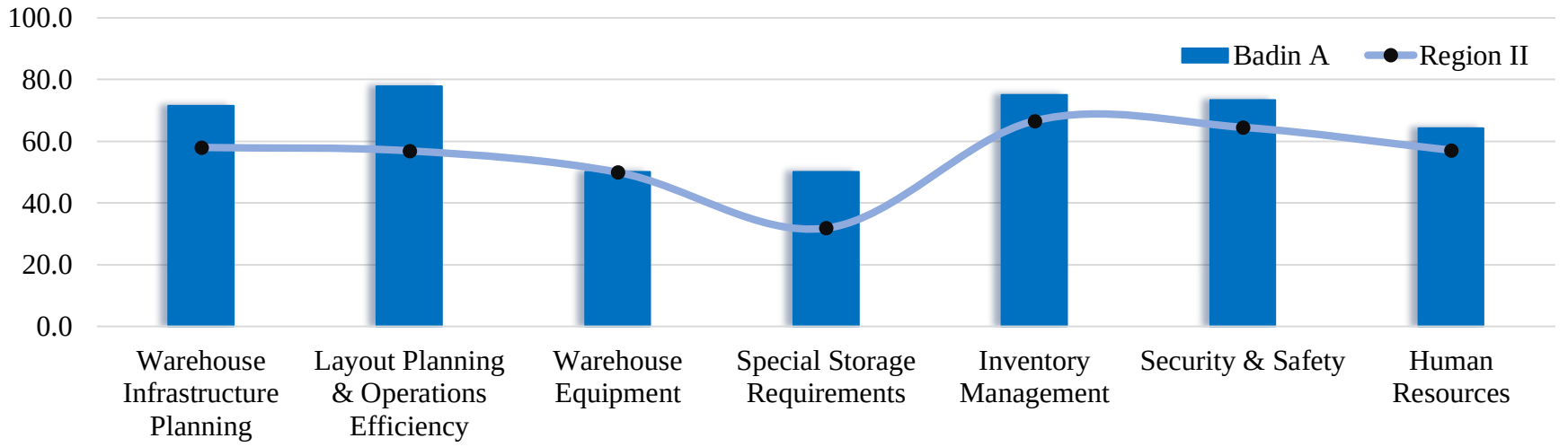


Highlights:

- No back up supply for electricity in the warehouse, only one small (5-KVA) generator is place for office
- Severe shortage of space for storing commodities in proper manner and due to over-stacking, some of the cartons were observed to be damaged
- Temperature of cold chain units are not being monitored
- No separate space allocation for flammable hazard
- Only one fire-extinguisher is placed while fire buckets were placed without filled with sand

Figure 27: Snaps from the warehouse of district Mirpurkhas B

Badin A

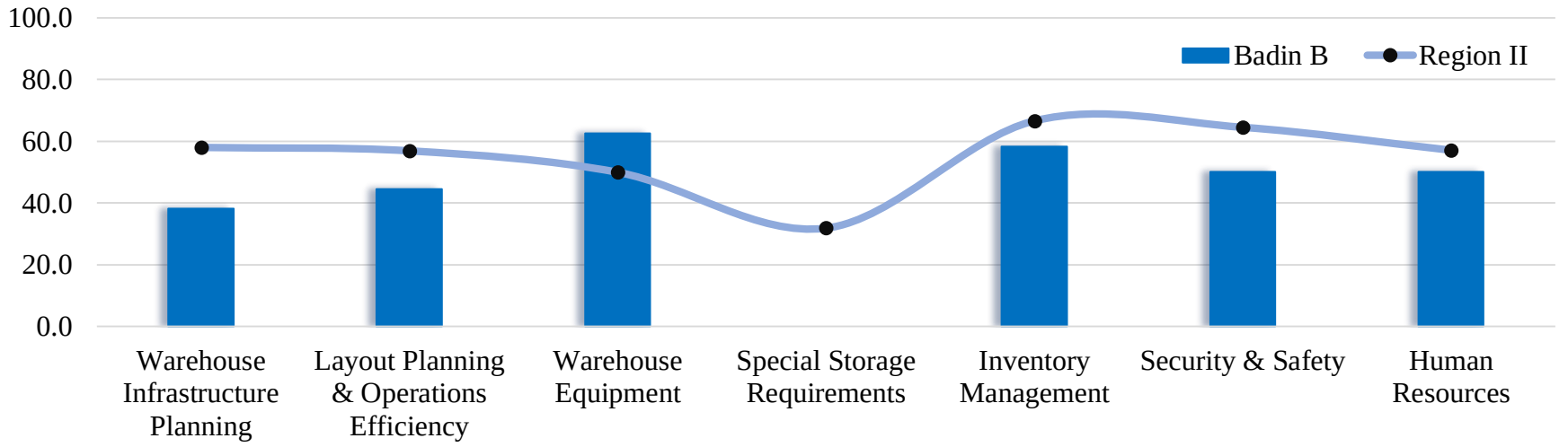


Highlights:

- In some areas of the warehouse floor tiles were broken
- This warehouse one small 5 KVA generator which is insufficient to support warehouse and DO together
- Cold storage unit has only one refrigerator but requires more for storing commodities
- There are no smoke detectors installed in the warehouse
- On cross checking with ERP, ledgers were well maintained

Figure 28: Snaps from the warehouse of district Badin A

Badin B

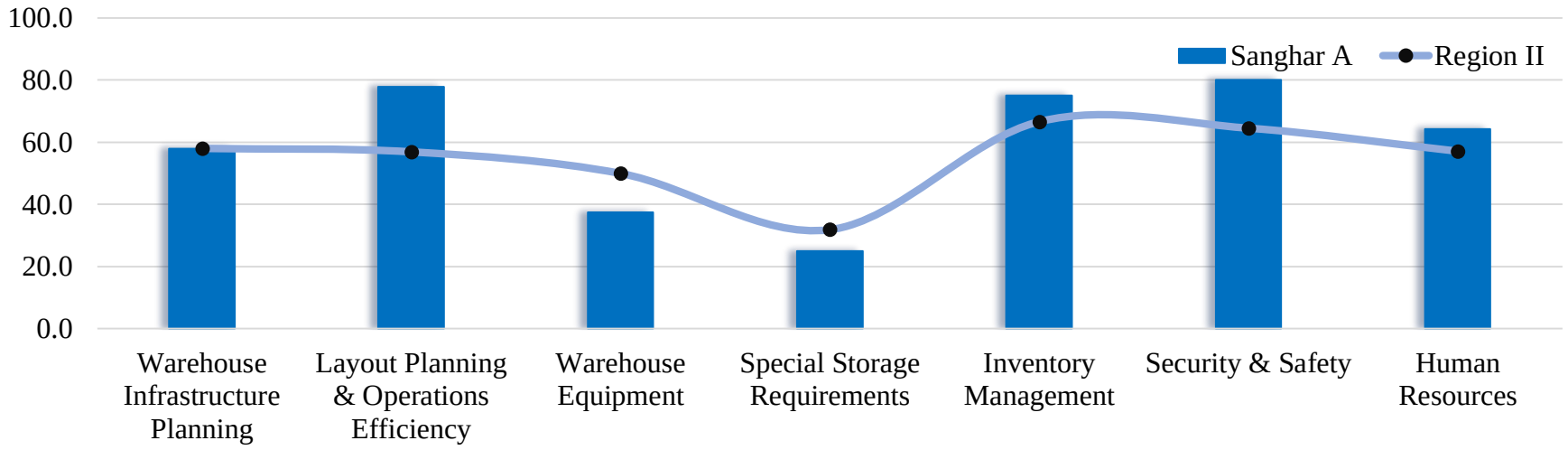


Highlights:

- Like many other warehouses, this warehouse is not currently maintaining the temperature chart
- There is no source of back up electric supply either by generator or solar panel
- Poor lighting system was observed in the warehouse
- Aisles were congested due to excess of commodities
- Flammable items are not stored in separate place
- Inventory is not up to date and ledgers were found to be incomplete

Figure 29: Snaps from the warehouse of district Badin B

Sanghar A

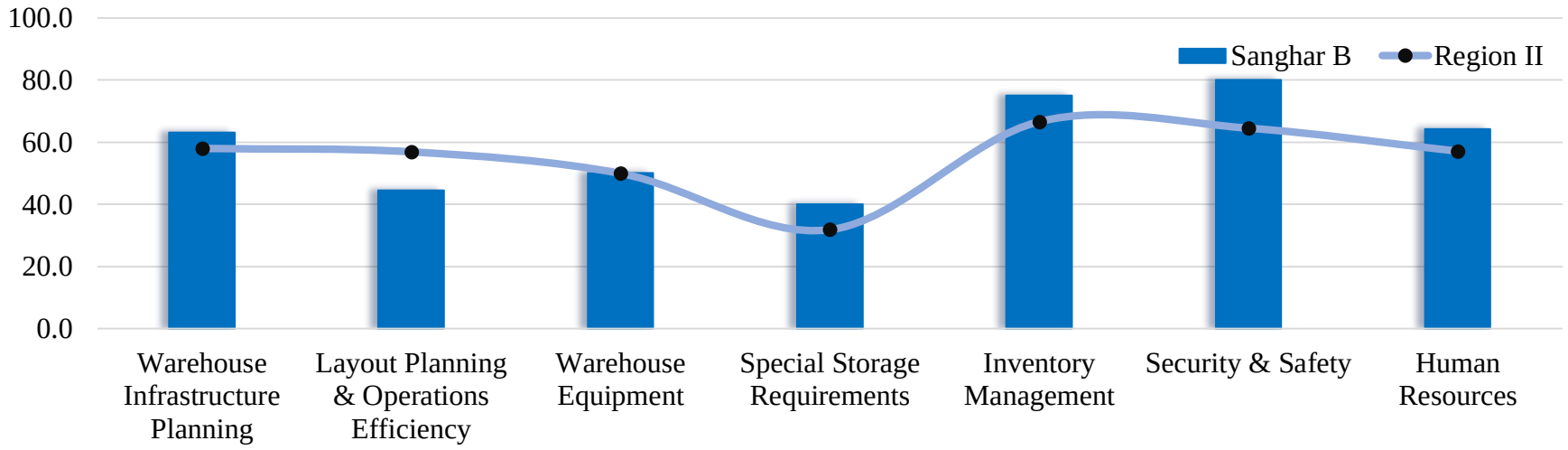


Highlights:

- This warehouse is functioning on a sport complex which is neither PPHI's property nor rented
- Electric supply has been disconnected since 2015, since then warehouse utilizes limited electricity provided by solar panels (such as exhaust fans are installed but are not in use)
- One of the most prominent observation that was made in this warehouse was its extremely poor condition of the ceiling
- In some parts of the warehouse there was inadequate lighting system
- Warehouse does not have PPE and do not record entry and exit of personnel visiting the warehouse

Figure 30: Snaps from the warehouse of district Sanghar A

Sanghar B

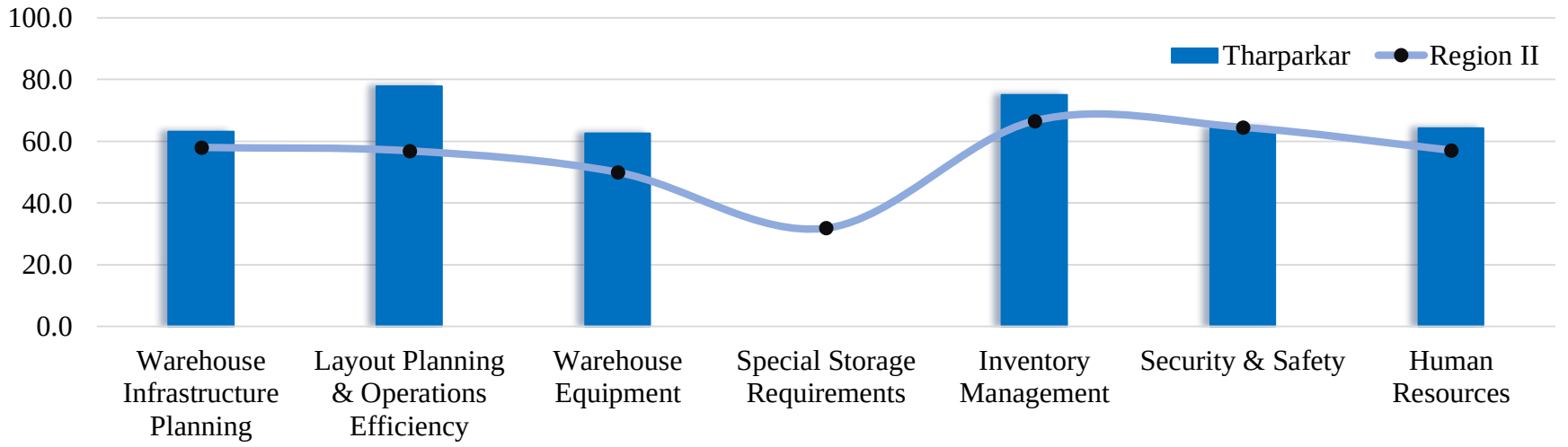


Highlights:

- There is no back up supply of electricity only limited number of UPS are available. Medical supplies in cold storage unit are highly susceptible to damage its potency due to poor temperature control
- In numerous areas of this warehouse, walls are required to repaint
- This warehouse is relatively small in size as compared to the commodities it stores
- Bin cards were maintained but ledgers were incomplete
- Some of the windows were observed to be broken

Figure 31: Snaps from the warehouse of district Sanghar B

Tharparkar

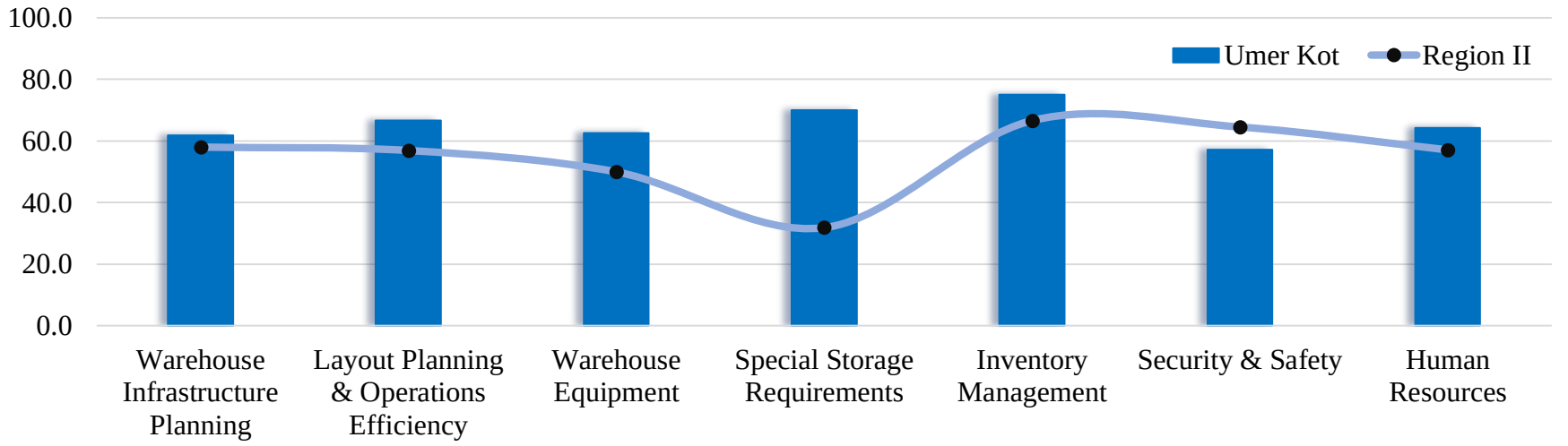


Highlights:

- Relatively clean and well-maintained warehouse
- ILR is available but cold storage medical supplies are stored in another warehouse at district office
- Four CCTV camera are installed but there was no functional LCD to monitor
- There is no mechanism to record entry/ exit of individuals from the warehouse but the notice has been posted for authorized personnel to access the facility
- One room of the warehouse is being used as a residential space for DMO & MOHQ, therefore causing shortage of space

Figure 32: Snaps from the warehouse of district Tharparkar

Umer Kot

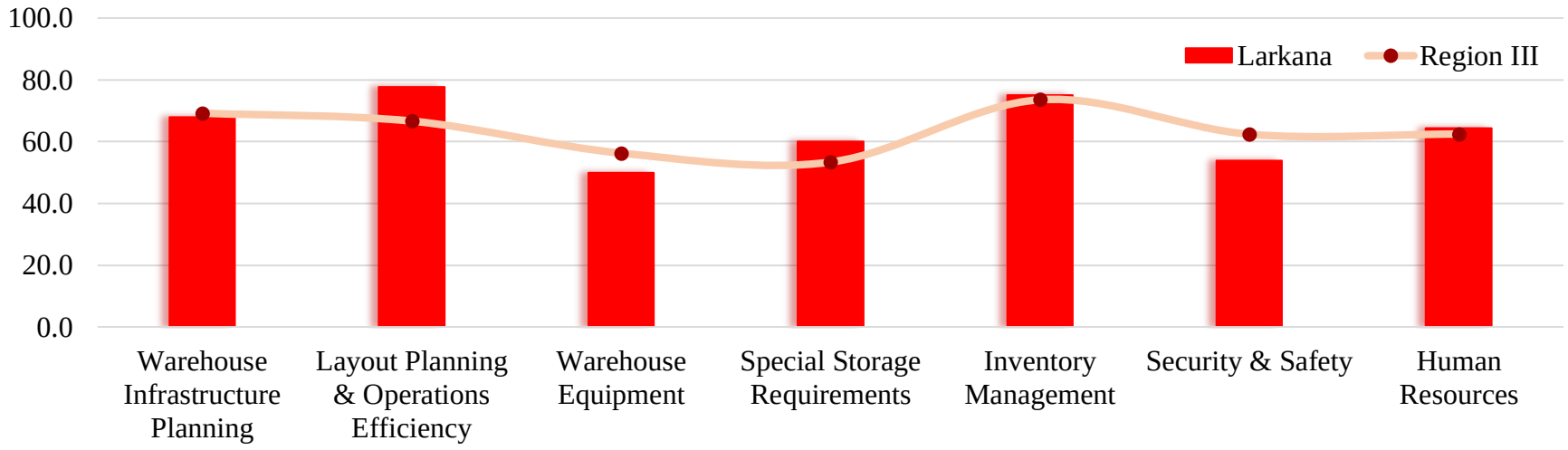


Highlights:

- Some areas of the warehouse had seepage, similarly fixation of tiles on floor is required
- This warehouse does not have a generator despite daily failure of electricity. Cold chain equipment gets back up electricity from the generator being used for DO
- Bin cards and ledgers are well maintained and up to date

Figure 33: Snaps from the warehouse of district Umer Kot

Larkana

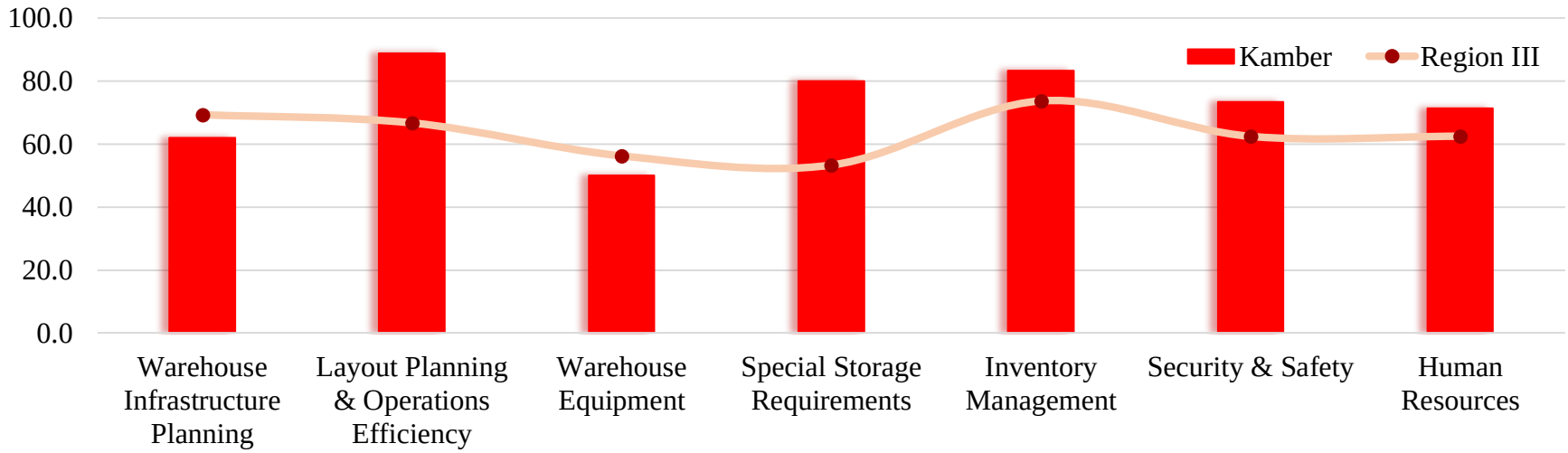


Highlights:

- Backup supply for electricity in this warehouse is shared with DO
- Since last three months, store is being managed by store assistant
- Ledgers are well maintained and warehouse does not have any expired commodities
- Well managed and wide space between aisles

Figure 34: Snaps from the warehouse of district Larkana

Kamber

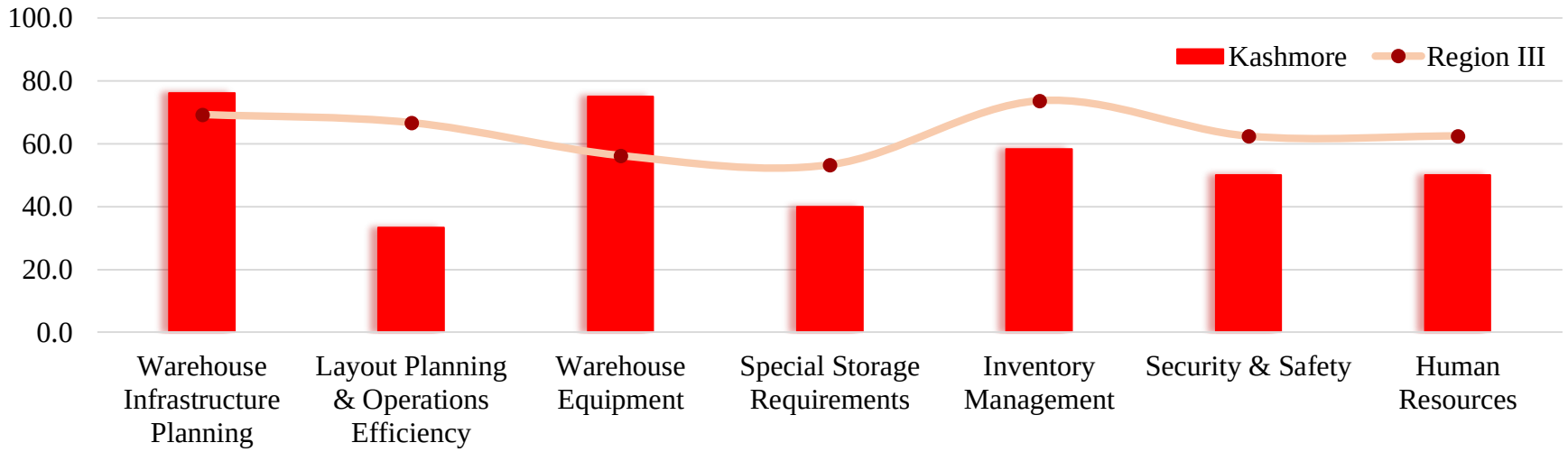


Highlights:

- This warehouse has insufficient lightening system
- A separate room has been allocated for receiving and supplying out the commodities
- Due to shortage of space, medicine boxes are stacked up for more than 2.5m which is not a recommended as this might cause damage
- Cold chain commodities are stored in DO across the warehouse

Figure 35: Snaps from the warehouse of district Kambar

Kashmore

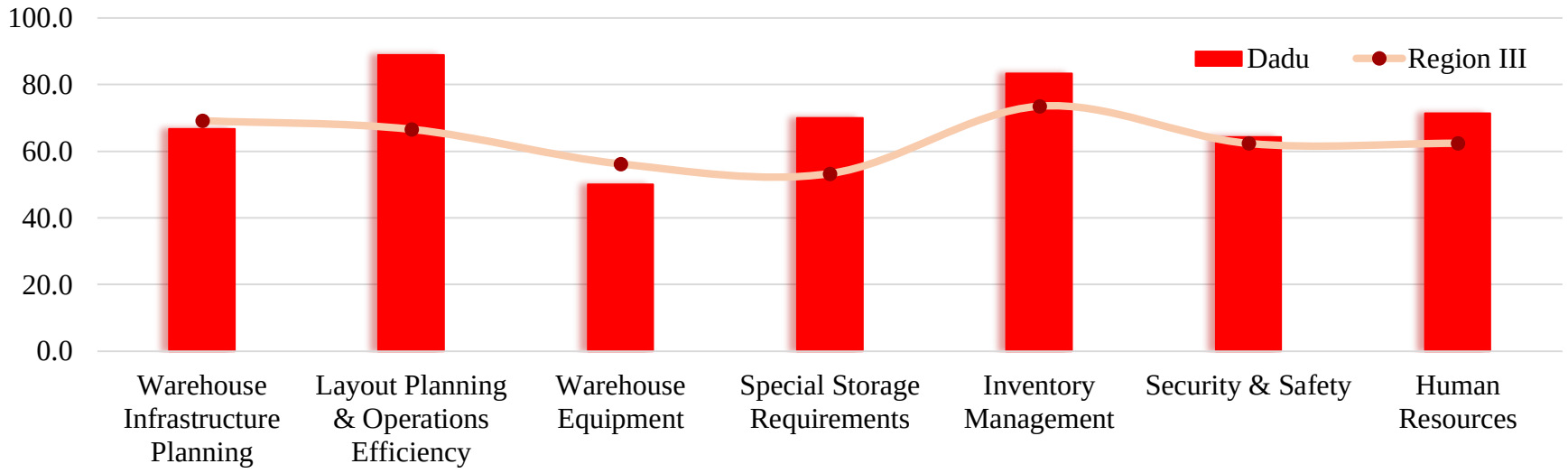


Highlights:

- According to the store manager, this warehouse requires more air conditioners especially during summer season
- Like many other warehouses, there is shortage of space to accommodate all the commodities with adequate spacing
- Out of all, only two refrigerators are supported by solar backup
- Functional smoke detector was present

Figure 36: Snaps from the warehouse of district Kashmore

Dadu

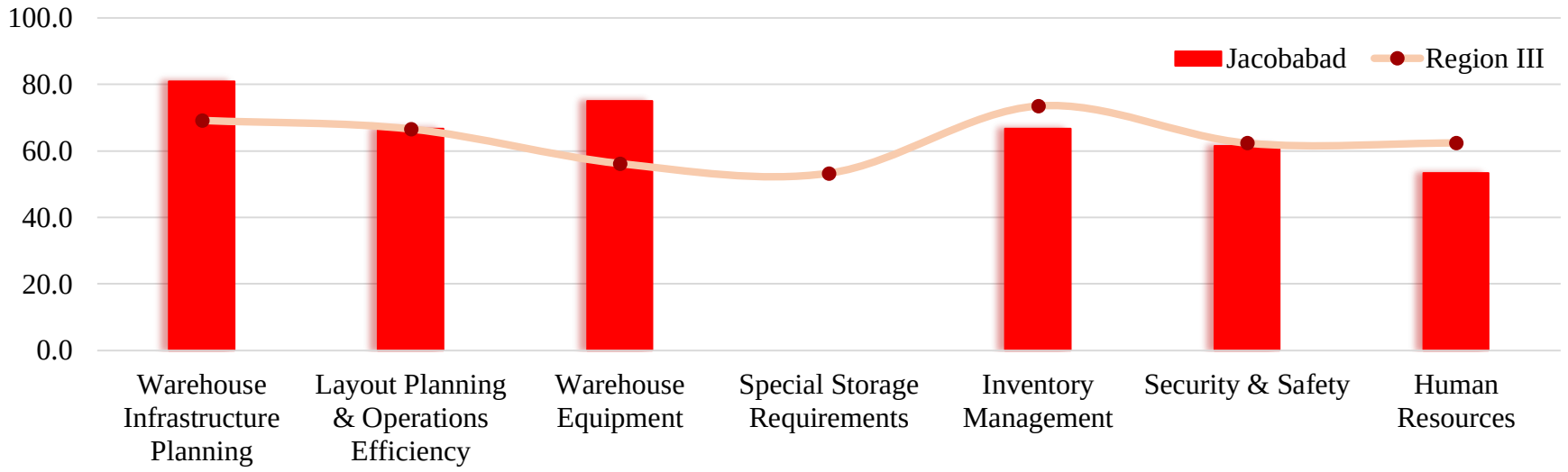


Highlights:

- This warehouse faces long hours of electric shut down but backup supply from solar system is available
- Store manager reported that during summer season, it is difficult to run all the air conditioners on solar system and requires high KVA generators
- Due to shortage of space, this warehouse has acquired additional space for expired and damaged goods
- For the above mentioned reason, cartons are piled up for more than 2.5 meters in height
- For cold storage items, total 5 refrigerators are available but two of them are kept at DO

Figure 37: Snaps from the warehouse of district Dadu

Jacobabad

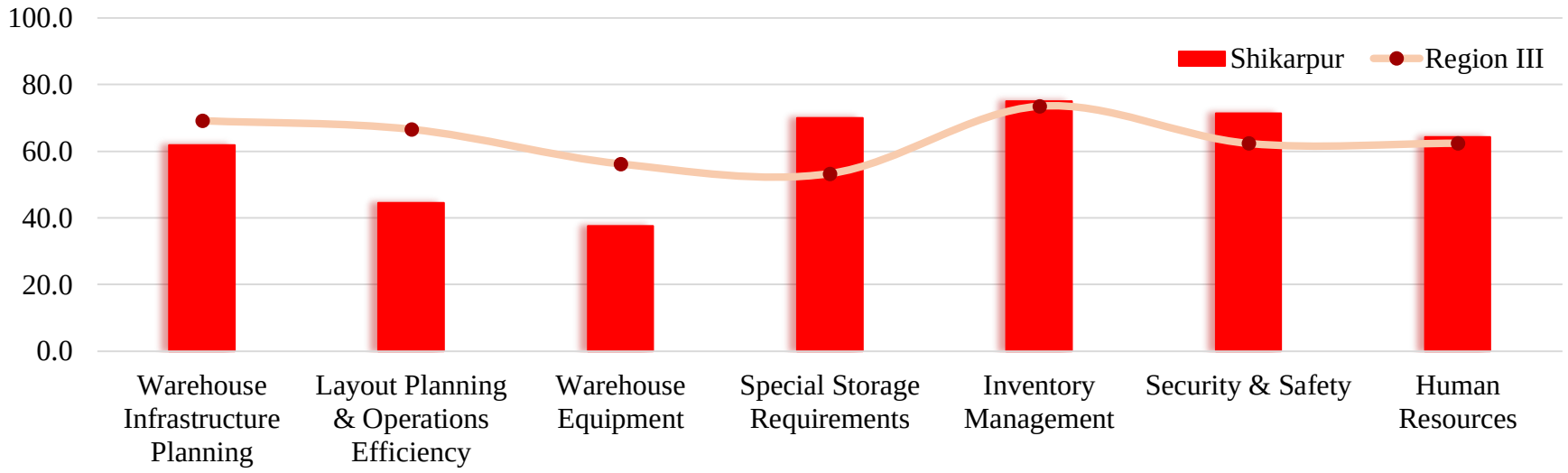


Highlights:

- Due to shortage of storage space, this warehouse has two additional stores away from the main warehouse
- Main warehouse does not have cold storage units
- Walls, ceilings and floors are in good condition
- Damaged goods are damped outside warehouse

Figure 38: Snaps from the warehouse of district Jacobabad

Shikarpur

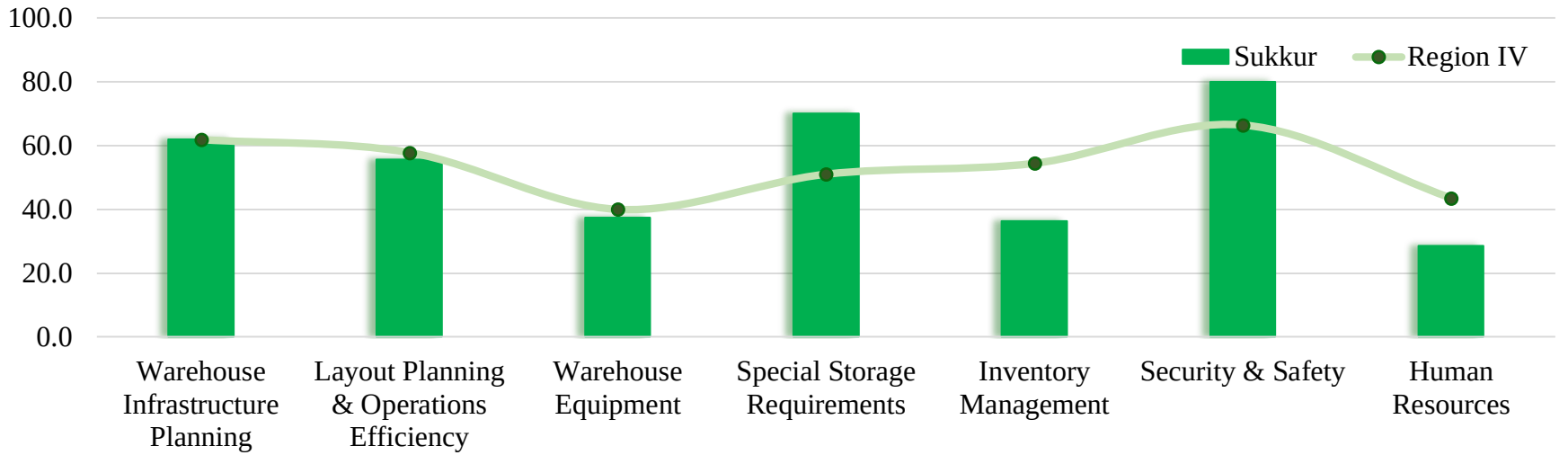


Highlights:

- In some part of the warehouse well poorly illuminated
- Due to shortage of space, washroom was being used as a storage room
- Fire extinguisher and sand buckets were present and warehouse staff is trained to use them
- Similar to other warehouses, this warehouse does not have job descriptions and SOPs for maintaining the warehouse function

Figure 39: Snaps from the warehouse of district Shikarpur

Sukkur

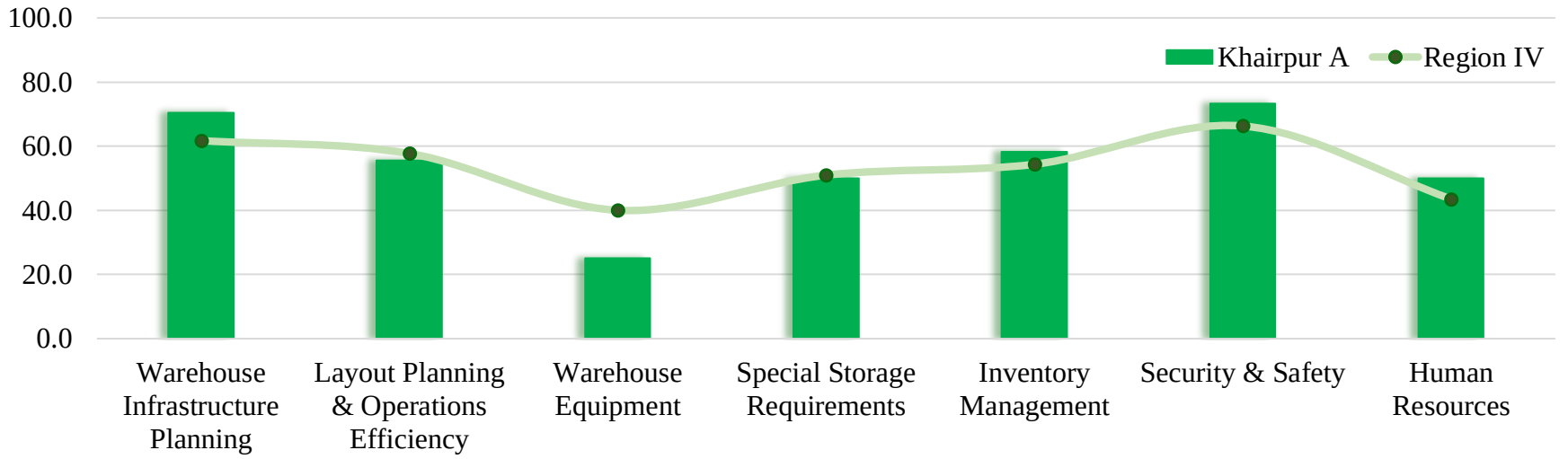


Highlights:

- This warehouse does not have any backup source of electricity
- Temperature chart is not being maintained
- For receiving and supplying out commodities, sufficient space is available
- Cartons are piled up to the roof which may cause damage due to weight
- Fire extinguisher available and function
- Walls, floors, and ceilings are generally in good condition

Figure 40: Snaps from the warehouse of district Sukkur

Khairpur A

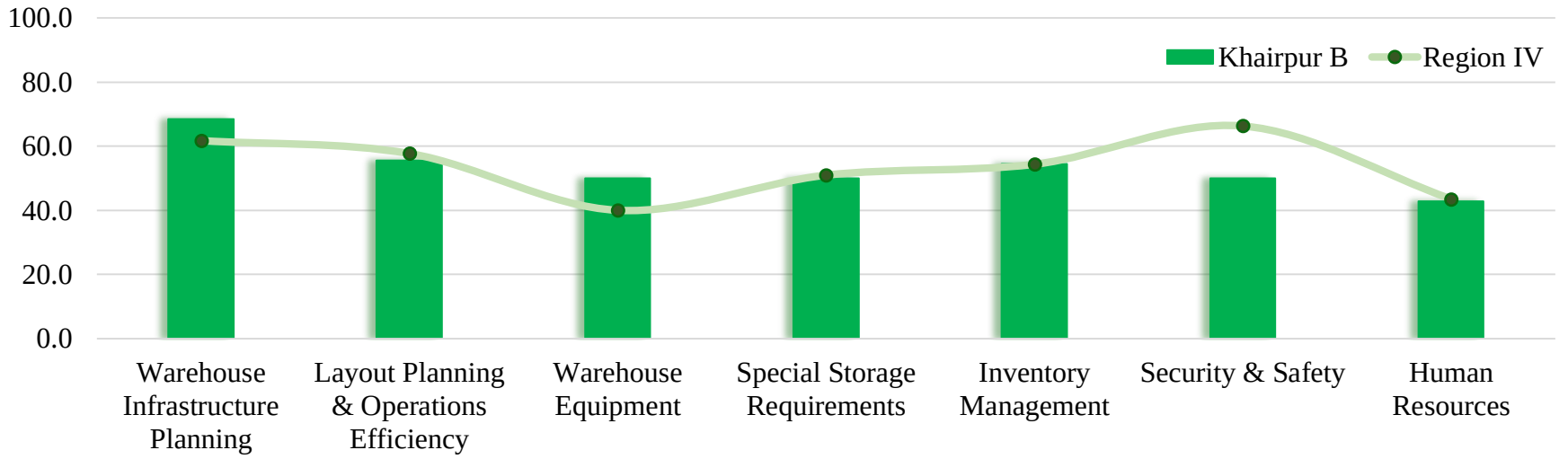


Highlights:

- This warehouse is spacious as compared to other warehouses
- PPE and firefighting equipment are available
- In some part of the warehouse, goods are not stored in proper manner
- A well maintained cold storage room is available
- All hazardous and flammable items are kept separately from medicines

Figure 41: Snaps from the warehouse of district Khairpur A

Khairpur B

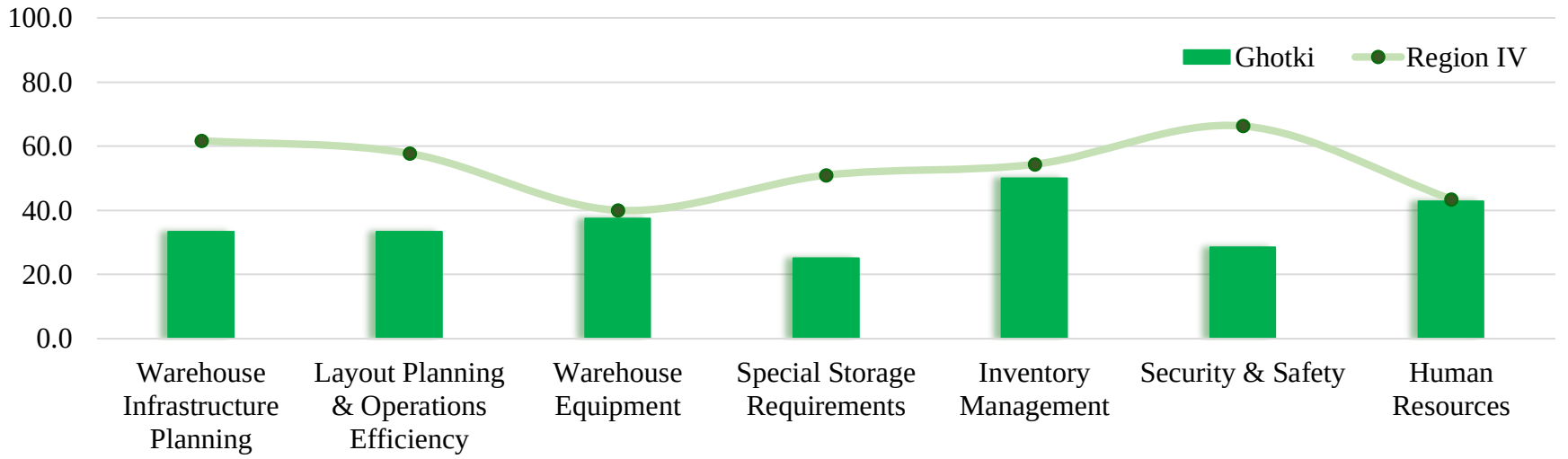


Highlights:

- Walls are generally in good condition but require paint
- Only solar system is providing electricity
- Warehouse has recently started monitoring temperature and recording it on the chart
- Extra pallets are available but due to shortage of space they are not in the use
- Ledgers and bin cards are available

Figure 42: Snaps from the warehouse of district Khairpur B

Ghotki

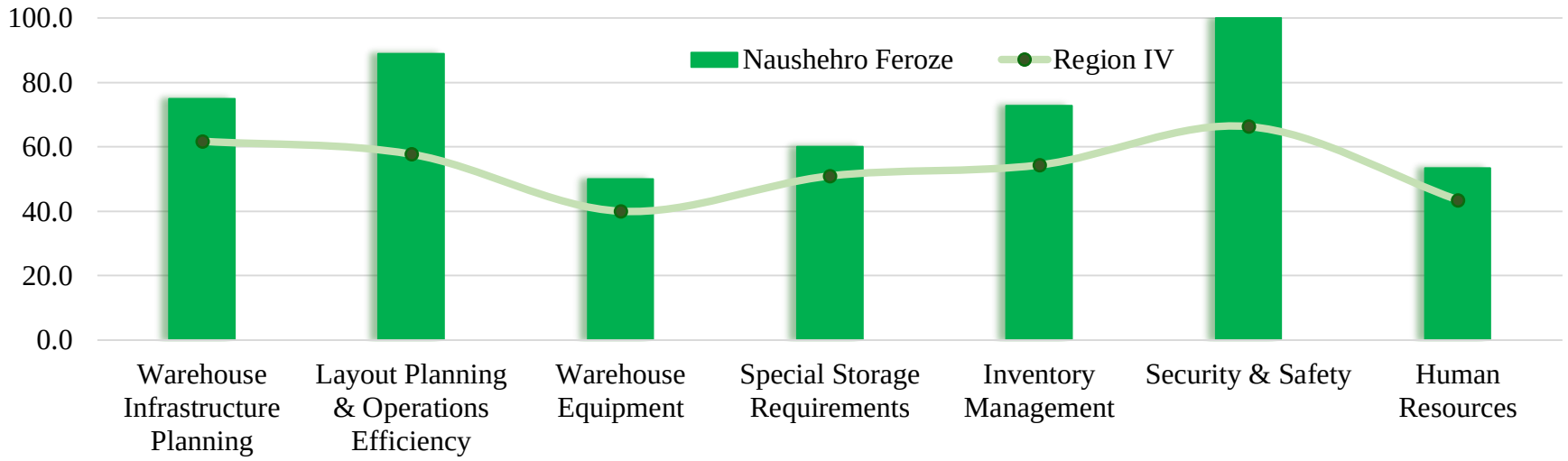


Highlights:

- According to the warehouse manager, there are two additional warehouses as there is shortage of space in the main warehouse
- In some part of the warehouse, commodities are not placed in systematic manner
- Some of the cartons are placed directly under the sunlight
- Walls, floors and ceilings require repair and renovation
- Additional warehouse is located on a busy street and does not have adequate space for loading/ unloading commodities

Figure 43: Snaps from the warehouse of district Ghotki

Naushehro Feroze



Highlights:

- In terms of cleanliness, this warehouse is adequately well maintained
- It has well-spaced placement of racks and cartons are in good condition
- Ledgers are well maintained with up-to-date record till November 2019
- Various charts such as for emergency contact numbers, organogram, medicine expiry calendar and SOPs were on display

Figure 44: Snaps from the warehouse of district Naushehro Feroze

Summary Matrix of section-wise percent score for each warehouse:

	Warehouse Infrastructure Planning	Layout Planning & Operations Efficiency	Warehouse Equipment	Special Storage Requirements	Inventory Management	Security & Safety	Human Resources	All Sections
Ghotki	33.3	33.3	37.5	25.0	50.0	28.6	42.9	35.8
TMK	50.0	44.4	37.5	20.0	45.5	57.1	35.7	41.5
Badin B	38.1	44.4	62.5	0.0	58.3	50.0	50.0	43.3
Mirpurkhas	42.1	33.3	37.5	40.0	41.7	73.3	35.7	43.4
Sujawal	64.3	44.4	37.5	30.0	36.4	68.8	28.6	44.3
TAY	64.3	33.3	37.5	50.0	45.5	46.7	35.7	44.7
Mirpurkhas B	66.7	33.3	37.5	30.0	58.3	38.5	50.0	44.9
Sukkur	61.9	55.6	37.5	70.0	36.4	80.0	28.6	52.8
Khairpur B	68.4	55.6	50.0	50.0	54.6	50.0	42.9	53.1
Khairpur A	70.4	55.6	25.0	50.0	58.3	73.3	50.0	54.7
Kashmore	76.2	33.3	75.0	40.0	58.3	50.0	50.0	54.7
Hyderabad	78.6	33.3	37.5	60.0	63.6	60.0	50.0	54.7
Jacobabad	81.0	66.7	75.0	0.0	66.7	61.5	53.3	57.7
Tharparkar	63.2	77.8	62.5	0.0	75.0	64.3	64.3	58.1
Thatta	71.4	55.6	50.0	40.0	66.7	75.0	57.1	59.4
Sanghar B	63.2	44.4	50.0	40.0	75.0	80.0	64.3	59.6
Sanghar A	57.9	77.8	37.5	25.0	75.0	80.0	64.3	59.6
Shikarpur	61.9	44.4	37.5	70.0	75.0	71.4	64.3	60.7
Jamshoro	69.2	77.8	50.0	60.0	63.6	73.3	50.0	63.4
Larkana	67.9	77.8	50.0	60.0	75.0	53.9	64.3	64.1
Umerkot	61.9	66.7	62.5	70.0	75.0	57.1	64.3	65.4
Badin A	71.4	77.8	50.0	50.0	75.0	73.3	64.3	66.0
Matiari	67.9	66.7	62.5	60.0	83.3	71.4	66.7	68.4
Dadu	66.7	88.9	50.0	70.0	83.3	64.3	71.4	70.7
N. Feroze	75.0	88.9	50.0	60.0	72.7	100.0	53.3	71.4
Kamber	61.9	88.9	50.0	80.0	83.3	73.3	71.4	72.7

Legend: Good score Poor score

CHAPTER IV: RECOMMENDATIONS

Based on the findings of we propose following recommendations to be implemented in order to improve PPHI Sindh's warehouses management:

- Warehouse floors must meet stress and strength requirements to bear the weight of commodities,
- For layout planning, identify warehouse activities, determine the required space and develop a realistic layout according to the existing constraints,
- Sufficient space should be allocated for human resource functions: e.g., reception, store manager office, meeting room and waiting area,
- Providing space for maneuvering commodities from and to the loading vehicle,
- Ensure that the products are not under direct sunlight,
- If the main source of electricity is not reliable, backup electrical supply should be ensured; either by solar system or generators that can support cold rooms and refrigerators,
- The warehouse's volume shall guide and determine the type of racks and/or shelves needed,
- Storing flammable items close to medical commodities can be dangerous and therefore such items should be stored in a separate room or re-locate to additional space available at DO,
- It is utmost important to keep inventory record up to date as it will guide the warehouse manager to prevent over and under-stocking,
- Regarding security & safety, warehouse manager should have adequate procedures. Such as limiting access into the warehouse compound and the warehouse itself is the first step to ensure a secure environment for the commodities,

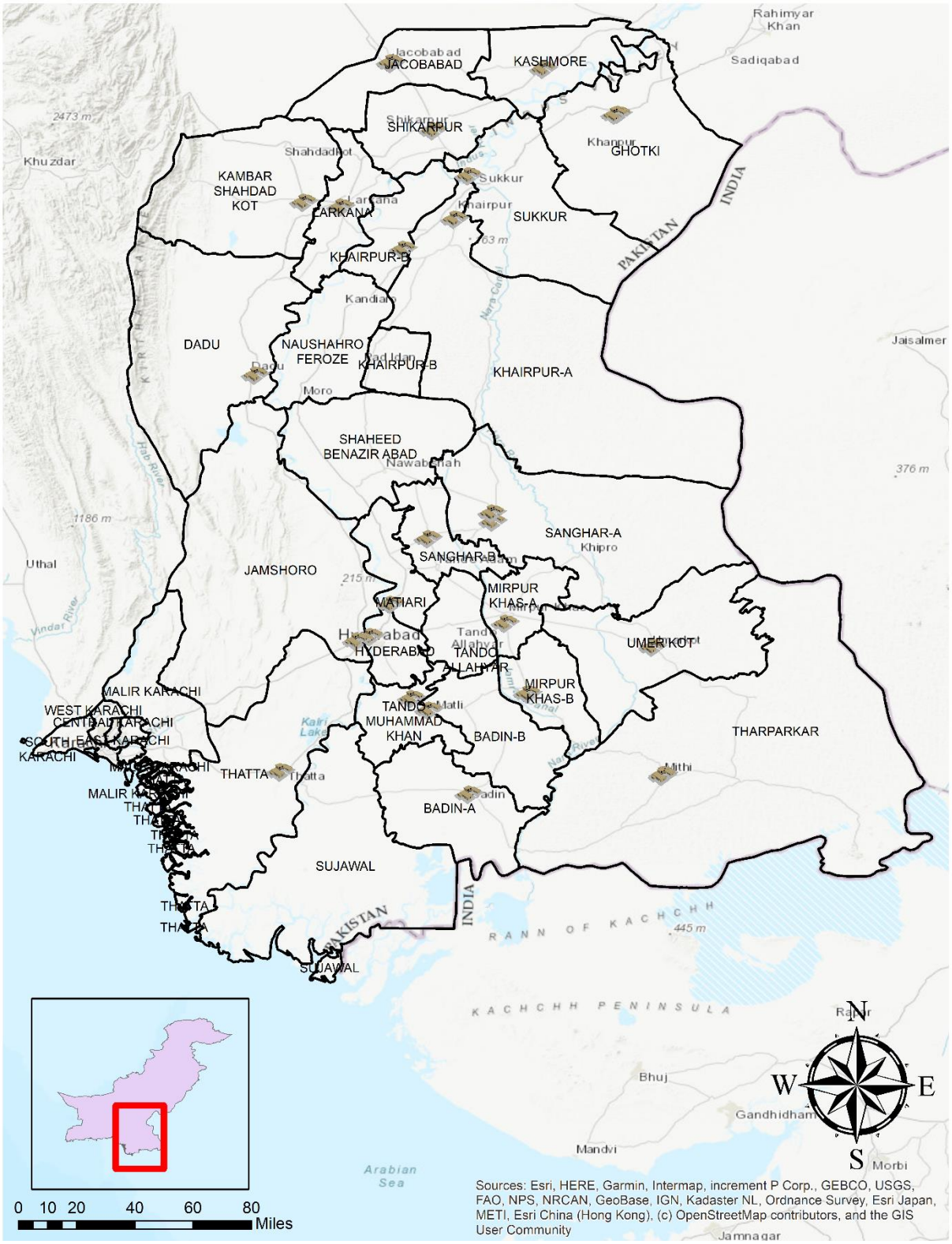
- Fencing, or a perimeter wall topped with wire, is often used to surround the compound. Security guards at the entrances are also advisable,
- Having a guest/visitor registration book will also help track who is coming and going. This needs to be implemented in all the warehouses,
- It is also necessary that warehouse staff should be well trained to use fire-fighting equipment and warehouse manager should make sure that the staff routinely use personal protection equipment (PPE),
- Each warehouse should have organogram displayed on the board along with job descriptions,
- It is highly recommended that PPHI's head office should design SOPs for the smooth functioning of the warehouse and implement them with the support of ROs.

CHAPTER V: CONCLUSION

Efficient functioning of the warehouse is an essential issue from the point of view of supply chain management of an organization. In this regards, PPHI Sindh has established network of warehouses across the province. Indicators used to measure warehouse efficiency in this assessment were aligned with the company's vision. In this assessment, it is found that PPHI's warehouses have basic capabilities for running warehouse operations. However, several inefficiencies have been highlighted which may hinder smooth functioning of these warehouses. Therefore, it is critical for each warehouse to overcome the shortcomings identified here and repeat this assessment after a certain amount of time to assess the improvement.

APPENDIX

Appendix 1: Distribution of PPHI Sindh's warehouse across Sindh



Appendix 2: Warehouse assessment tool kit

GENERAL SECTION: INFORMATION PANEL			
S. No.	Question		
Gen1	Region:		
Gen2	District:		
Gen3	Name of the warehouse:		
Gen4	Ownership status of the warehouse:	1. PPHI owned	2. Rented
Gen5	GPS location:	1. Long:	2. Lat:
Gen6	Name of the store/ warehouse manager		
Gen7	Gender	1. Male	2. Female
Gen8	Age (years)		
Gen9	Highest educational degree:	1. None 2. Intermediate 3. Graduate 4. Post-graduate	
Gen10	Any specific qualification in warehouse management?		
Gen11	Working experience in warehouse management (years)		

SECTION A: WAREHOUSE INFRASTRUCTURE PLANNING			
S. No.	Question		
A1	Does the overall condition of the warehouse appear clean and tidy (that is free of dust)?	1.Yes	2.No
A2	Ceilings are in good condition (not warped & cracks, free of holes)?	1.Yes	2.No
A3	Do the ceiling or walls showing any staining/seepage indicating a leaking/ roof?	1.Yes	2.No
A4	Floor is in good condition, level and free of holes and free of molds?	1.Yes	2.No
A5	The walls are in good condition, clean and painted?	1.Yes	2.No
A6	There is adequate lighting inside the warehouse?	1.Yes	2.No
A6a	Justify your response? (Note functional and number of lights)		
A7	Is the inventory directly exposed to sunlight?	1.Yes	2.No
A8	Warehouse is fitted with air-conditioners? If no, go to question A9	1.Yes	2.No

A8a	Number of air-conditioners installed in this warehouse:			
A8b	Number of functional air-conditioners:			
A8c	On average how many hours per day this warehouse runs air-conditioners?			
A8d	Does this warehouse run air-conditioners during night?	1.Yes		2.No
A8e	In case of electricity failure, does this warehouse keeps running air-conditioners on backup system?	1.Yes		2.No
A9	Is there a working thermometer? If no, go to question A10	1.Yes		2.No
A9a	If yes, ask store manager to show it and compare with the calibrated thermometer. Record temperature from both the thermometers	1. _____ warehouse thermometer		
		2. _____ calibrated thermometer		
A9b	Does this warehouse maintain temperature charts?	1.Observed	2.Reported	3.No
A10	Is there a working hygrometer? If no, go to question A11	1.Yes		2.No
A10a	Does this warehouse maintain hygrometer charts?	1.Observed	2.Reported	3.No
A11	Warehouse area is visually free from harmful insects and rodents?	1.Yes		2.No
A12	Is there interruption to the main electrical supply? If no, go to question A13	1.Yes		2.No
A12a	If yes, how frequent: If option 2 or 3 is selected, go to question A13	1. Daily 2. Twice weekly 3. More than twice weekly		
A12b	If daily, for how many hours main electric supply gets interrupted	____ (hours)		
A13	Does staff report breakers tripping when it rains or when the air-conditioners are on full load?	1.Yes		2.No
A14	Does the warehouse have a generator? If no, go to question A15	1.Yes		2.No
A14a	Number of generators			
A14b	Functional If no, go to question A15	1.Yes		2.No

A14c	Note down KVA of largest generator		
A14d	Can the generator handle the full site load, including air-conditioners?	1.Yes	2.No
A14e	Is the generator on standby (auto start)?	1.Yes	2.No
A14f	Is there an adequate budget for the purchase of generator fuel?	1.Yes	2.No
A14g	Is there an assigned individual for operating generator	1.Yes	2.No
A14h	Has there been any scenario in previous month in which generator could not be operated due to unavailability of fuel?	1.Yes	2.No
A14i	Is there a maintenance plan on file for the generator?	1.Yes	2.No
A15	Does the warehouse have a back up energy supplied by solar system?	1.Yes	2.No
A16	Has there been any scenario in previous week in which there was failure in electric supply in warehouse? If no, go to question A17	1.Yes	2.No
A16a	If yes, for how long:	1. < 6 hours 2. 6 – 12 hours 3. 13 – 24 hours 4. 25 – 36 hours 5. 37 – 48 hours	
A17	Additional notes from the assessor:		

SECTION B: LAYOUT PLANNING & OPERATIONS EFFICINCY			
S. No.	Question		
B1	How many days per week this warehouse is operational?		
B2	What is the frequency of supply out/ dispatching orders per quarter?		
B3	What is the frequency of supply in/ receiving orders per quarter?		
B4	Can delivery vehicles access loading/receiving bays?	1.Yes	2.No

	(inside or outside the warehouse)		
B5	Are receiving and dispatch areas separated?	1.Yes	2.No
B6	In the receiving area is there sufficient secure space to arrange and sort an incoming delivery?	1.Yes	2.No
B7	Is there a designated space for expired or damaged goods?	1.Yes	2.No
B8	Is the existing floor space for pallet stacking, shelving or racking less than 75% full?	1.Yes	2.No
B9	Are the aisles between the stacked pallets or racking clear of stored commodities?	1.Yes	2.No
B10	Additional notes from the assessor:		

SECTION C: WAREHOUSE EQUIPMENT			
S. No.	Question		
C1	Are there sufficient pallets available?	1.Yes	2.No
C2	Are there sufficient pallet jacks available?	1.Yes	2.No
C3	If pallet racks are present, is there an operable fork truck with a maintenance schedule?	1.Yes	2.No
C4	Is there a storage system utilized (shelving, racks or pallet stacking) and is it in good condition?	1.Yes	2.No
C5	Is there adequate aisle space (3.35 meters) and clearance for material handling equipment?	1.Yes	2.No
C6	Where commodities are stored on the floor are they stacked less than 2.5 meters high?	1.Yes	2.No
C7	Are cartons in good condition, (not crushed due to mishandling or poor stacking.)?	1.Yes	2.No
C8	Are cartons and products up off the floor and protected from water and dust?	1.Yes	2.No
C9	Additional notes from the assessor:		

SECTION D: SPECIAL STORAGE REQUIREMENTS			
S. No.	Question		
D1	Does this warehouse have products that require cold chain storage? If no, go to question D8	1.Yes	2.No
D2	Does this warehouse have cold chain storage unit?	1.Yes	2.No
D2a	If yes, list down the items kept in cold chain storage unit:		
D3	Is there sufficient capacity for cold chain product?	1.Yes	2.No
D4	Does this warehouse have fridge to store commodities?	1.Yes	2.No
D4a	If yes, how many fridges are there		
D4b	If yes, list down the items kept in fridge		
D5	Are temperatures monitored for each discreet storage unit (i.e. for each cold storage rooms and fridges)?	1.Yes	2.No
D6	Do the refrigerators run on solar power?	1.Yes	2.No
D7	If the cold chain facilities run on electricity, is there a back-up source of power? (i.e. generator/ solar back up)?	1.Yes	2.No
D8	Is there a designated area for flammable / hazardous items?	1.Yes	2.No
D9	Are flammable/hazardous items kept in a separate area away from the main buildings?	1.Yes	2.No
D10	Is there any locked area (separated from other general items) for any specific commodities?	1.Yes	2.No
D10a	If yes, list down such commodities		
D11	Additional notes from the assessor:		

SECTION E: INVENTORY MANAGEMENT			
S. No.	Question		
E1	What is/are the method(s) use for recording inventory?	1 = Paper based 2 = Electronic 3 = Both 4 = None 5 = Other	
E2	Are there barcode labels pasted on the boxes?	1.Yes	2.No
E3	Does this warehouse have barcode scanner?	1.Yes	2.No
E4	Does this warehouse maintain its inventory in bin cards	1.Yes	2.No
E5	Are ledgers maintained?	1.Yes	2.No

E6	Are ledgers legibly and accurately maintained – audit a sample and cross check the same sample on the corresponding bin card	1.Yes	2.No
E7	Is there a process to investigate and resolve discrepancies on records?	1.Yes	2.No
E8	Are full physical inventory stock counts performed at least every 3 months?	1.Yes	2.No
E9	Is the write off and destruction of damaged or expired stock processed regularly?	1.Yes	2.No
E10	Is there any process for documentation for expired stock? If no, go to question E11	1.Yes	2.No
E10a	Ask to see such documentation for expired stock	1.Observed	2.Reported
E11	Are products organized according to FEFO (First expired, first out)?	1.Yes	2.No
E12	Additional notes from the assessor:		

SECTION F: SECURITY & SAFETY			
S. No.	Question		
F1	Building perimeter is surrounded by a high wall or fence, with entry guarded?	1.Yes	2.No
F2	Are security (CCTV) cameras installed in this warehouse? If no, go to question F3	1.Yes	2.No
F2a	If installed, check all of them are working	1.Yes	2.No
F3	Is access to the warehouse limited to only designated/authorized staff?	1.Yes	2.No
F4	Are windows intact and burglar proofed (i.e. grilled windows)?	1.Yes	2.No
F5	Are the doors and windows well secured? (i.e. having lock and keys)	1.Yes	2.No
F6	Is there any mechanism to record entry and exit from the warehouse? If no, go to question F6	1.Yes	2.No
F6a	If yes, observe how warehouse manager keeps the record	1.Observe	2.Reported
F7	Is firefighting equipment available? If no, go to question F10	1.Yes	2.No

F8	Do the labels on the firefighting equipment indicate that it has been serviced within the last year?	1.Yes	2.No
F9	Are staff trained on how to use the freighting equipment?	1.Yes	2.No
F10	Are there fire buckets (filled with sand) available?	1.Yes	2.No
F11	Does this warehouse have contact no for emergency firehouse displayed prominently on a wall?	1.Yes	2.No
F12	Are there functional smoke detectors? If no, go to question F13	1.Yes	2.No
F12a	If yes, check smoke detectors	1.Functional	2.Not functional
F13	Are there items of personal protective equipment being used (gloves, boots, etc.)?	1.Yes	2.No
F14	Additional notes from the assessor:		

SECTION G: HUMAN RESOURCES			
S. No.	Question		
G1	Now I will ask you to report staff for warehouse management:		
G1a	Number of Store Manager: _____		
G1b	Number of Assistant Store Manager: _____		
G1c	Number of Medicine Handler: _____		
G2	Is there an organizational structure and chart posted showing each warehouse-related post?	1.Yes	2.No
G3	Is there sufficient staff capacity to run the warehouse and authority to oversee warehouse management?	1.Yes	2.No
G4	Are there records of external visits or audits?	1.Yes	2.No
G5	Are there posted job descriptions for all positions at the warehouse?	1.Yes	2.No
G6	Are there up to date Standard Operating Procedures (SOPs) for all functions and processes posted on this warehouse? If no, go to question G7	1.Yes	2.No
G6a	If yes, ask the manager to show	1.Observed	2.Reported
G7	Is there active on-the-job training for staff?	1.Yes	2.No
G8	Is there a process for new hire orientation?	1.Yes	2.No
G9	Following question is to assess store manager's level of knowledge regarding warehouse management		

G9a	For medical supplies, which type of flow of stock is recommended	1.Flow-in/ Flow-out	2.First-expiry/ First-out
G9b	What is the recommended temperature threshold for medicines with instruction: "store in dry and well-ventilated place"	1.10 ^{0}C	2. 30 ^{0}C
		3. Between 30 - 40 ^{0}C	4.Dont know
G9c	An inventory control card is an individual stock keeping record that contains information about a single product	1.True	2.False
G9d	A bin card is an individual stock keeping record that holds information about all the lots of a single product	1.True	2.False
G10	Additional notes from the assessor:		

Appendix 3: ODK Application (sample screenshot)