

SECRET**TERRAIN ANALYSIS****SOUTH OF SUTLEJ****31 CORPS AOR**

1. **Historic Context of 31 Corps AOR.** Area South of Sutlej along International Border is part of Cholistan and Thar deserts, and it is commonly described as South of Sutlej & Desert Sectors. Historically, the area was part of 'State of Bahawalpur' which came to lime light during "Rai Dynasty" in 405 AD. A separate entity was given to the State under the reign of Abbassi Doudpotras, who ruled it for over 200 years and British Government placed it in high esteem. State of Bahawalpur along with Hyderabad and Bhopal was among the leading princely states of Subcontinent in 1947. However, it was the only state which was being ruled by a Muslim and had a Muslim majority population. At the time of independence, Nawab Sir Sadiq Khan V donated Rs seventy million and one month salary of government department. In 1955, Nawab of Bahawalpur decided the accession of Bahawalpur with Pakistan. It was given the status of one of the divisions of Punjab, thereby its identity as a separate state ceased to exist.
2. Militarily, during 1965 and 1971 wars, limited offensive was launched to reduce Pakka enclave in Sulemanki sub sector. Major success was in 1971 war, when Pakistani troops captured area across Sabuna distributary. This raised concern in Indian High Command; resultantly, Indian 1st Armoured Division and 14 Division (-) were positioned at Muktasir – Faridkot areas.
3. After 1971 war, in the process of modernization, India carried out mechanization of her armed forces. Importing the idea from 'Deep Battle Theory', 'Concept of Simultaneity' was manifested in the form of 'Sunderji Doctrine' conceived by General Krishna Swami Sunderji. It aimed at deep and synchronized sledgehammer blows by strike corps inside Pakistan in a high intensity battle. The doctrine was practiced during 1986 / 87 in exercise 'Operation Brasstacks' with largest troops mobilization under Southern Command which was responsible for this area at that time. As an outcome, India crystalized its Offensive Defensive strategy. During this exercise, Pakistan's deceptive assemblies of 2 Corps North and South of River Sutlej brought in limelight the importance of this area. Retrospective to "Operation Brasstacks", 31 Corps was raised at Bahawalpur in 1988 comprising 35 and 14 divisions deployed from Sulemanki HW in North till Salamsar in South. Pakistan also carried out its largest military exercise 'Zarb e Momin' in 1989 and evolved Defensive Offensive strategy. Sequel to these evolving strategies, area South of Sutlej became operationally important for both Pakistan and Indian military planning.
4. During 2001 / 2002, India carried out coercive assemblies as part of 'Operation Parakaram' with main force projections across 31 Corps and at seam of 31 and 5 Corps AORs. Post 'Operation Parakaram', India military thinkers conceived 'Cold Start Doctrine' in 2004 / 2005 operationalized as 'Pro Active Strategy'. In same context, area South of Sutlej gained prominence in 2005 when Indian Army raised South Western Command comprising 10 Holding Corps and 1 Strike Corps with area of responsibility from Fazilka in North till Bikaner in South. The South Western Command articulates TFR 2 of the Army which is considered critical to Indian Army Commander's design, as it weaves Indian Army's defensive and offensive maneuver in a cohesive whole. Thus, South of Sutlej emerge as operationally significant zone which has pivotal position in Pakistan and Indian Army plans.
5. With this background, the panel has carried out terrain analysis of area South of Sutlej to assess its implications on military operations. The presentation will first

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cover the peculiarities of the terrain from Sulemanki HW till Salamsar followed by important strategic and operational conclusions for planning and conduct of defensive and offensive operations in this Zone. Thereafter, important developments with respect to threat will be highlighted to conclude the presentation at determining the operational significance of South of Sutlej i.e. 31 Corps AOR.

6. **Aim.** To present terrain analysis of 31 Corps AOR.

7. **Sequence**

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|----|-----------------------|----------------------------------|
| a. | <u>Part 1.</u> | Terrain Profile. |
| b. | <u>Part 2.</u> | Cis Frontier Military Aspects. |
| c. | <u>Part 3.</u> | Trans Frontier Military Aspects. |
| d. | <u>Part 4.</u> | Operational Significance. |

SECRET**Part 1****Terrain Peculiarities**

8. **General Description.** Area SoS extends from Sulemanki HWs in NE to Salamsar in the SW with a total frontage of approx 379 Kms. Seen from the North, the area is like an inclined triangle, with its tip at Smke HWs and base along line Salamsar – Punjnad. Min depth of the zone is at Smk HWs whereas it has max depth from Salamsar to Punjnad (approx 187 kms). Area West of River Sutlej falls into comm Z whereas in its East is the cbt Z having varying depth.

Cis-frontier

9. **Topography.** Topographically, this zone can be divided into three sub sectors i.e Green Belt, Semi Desert and Prime Desert Belt.

- a. **Green Belt.** Tapers off from Sulemanki HWs towards the desert around Fort Abbas, Marot and KPT. Green belt is heavily cultivated having well dev irrigation system. The water channels flow parallel to IB from NE to SW creating compartmentation eff and have good defensibility due to high banks. Flat nature of terrain coupled with high water table and water logging has resulted in low bg capacity of soil allowing only 4 to 8 Tk passes even in dry weather. Most of the towns and comm cen are loc in shallow depth which coupled with water channels have increased conurbation eff.
- b. **Semi Desert Belt.** Area between Green Belt and Line Winjor – Derawar is the Semi Desert Sec which is gen flat and open especially toward SW. Ht of sand dunes vary from 10–15 ft and dhars are open facilitating mov of mech forces. However engr effort is req for sustained wheeled tfc. No maj BUA is loc in shallow depth.
- c. **Prime Desert Belt.** It is part of the 'Greater Cholistan', extending towards south of Line Winjor – Derawar. This sec consists of high sand dunes having ht upto 70 ft making x-cty mov difficult and logistically challenging. These sand dunes are irregular in shape having slip face toward NE. Dhars are less firm due to loose sand and trs req maj engr effort for sustained mov. BUAs in the desert are almost non-existent.

10. **Comm Infra**

- a. Green belt is having well dev rd network, whereas Semi desert and Desert Belt are devoid of comm infra. Most of the laterals and penetrants are CI 70. The imp penetrants are as fol:-
 - (1) Sulemanki – Okara.
 - (2) Bwn – Sahiwal.
 - (3) Fort Abbas – Vihari – Chichawatni.
 - (4) Yazman – Bwp – Multan.
- b. Whereas maj laterals are as fol:-
 - (1) Okara – Khanewal – Multan.
 - (2) Multan – Pakpattan – Haveli.
 - (3) Sulemanki – Bahawalnagar – Bwp.
 - (4) Bahawalnagar – Harunabad – Fort Abbas.
- c. **Rly Trs.** Area North of River Sutlej has well laid and operational railway network where all Rly Lines are Broad Gauge. Rly Lines South and East of R Sutlej are either non-functional or operating at reduced capacity. All rly lines in the area are broad gauge. Rly lines North of R Sutlej incl rly line are as fol:-
 - (1) Okara – Multan.

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- (2) Haveli Lakha – Vehari – Lodhran
- (3) Multan – Bwp (the only rly link between north and south of Sutlej)
- (4) Khanewal – Lodhran.
- d. Rly Lines South and East of R Sutlej which are either non func or op at reduced cap incl fol:-
 - (1) Bwn – Bwp (Although remained disused for a long pd, however, recently being utilized).
 - (2) Bwn – Fort Abbas (Presently disused).
 - (3) Fort Abbas – Yazman (It is disused and at places the tr is even non-existent).

11. **Obs & Irrigation Sys.** 31 Corps AOR has a good mix of obs sys which incl river, canals, DCBs, pondages and RFs. Water regulating structures on River Sutlej and various canals play an imp role in this obs sys. Imp HWs in 31 Corps AOR are Sulaimanke, Islam, Jalwala and Wallar HWs. Maj obs in 31 Corps area are as fol:-

- a. **River Sutlej.** It flows from NE to SW, however flow of water is con by India at Bahkra Dam, Harike HWs and Hussaini Wala HWs. Due to water regulation by India; river remains dry. However, to meet our irrigational needs, water of River Ravi is diverted into this river at Sulemanki HWs through Balloki–Sulemanki Link Canals.
 - (1) **Obs Value.** Although River Sutlej is a maj obs; however, its obs value is reduced in winters when only nominal water is aval. In flood season the xing will be impossible in the entire length of the river.
 - (2) **X-ing Sites.** There are 9 xings on R Sutlej out of which 6 x-ings at Smke, TLB, Islam HWs, Mailsi Syphon, Empress Br and M-5 are CI 70.
- b. **Canals.** Most of the irrigation channels and canals are loc in Green Belt. These incl:-
 - (1) **Eastern Sadqia Canal.** It originates from Sulemanki HWs and flows parallel to IB upto Bwn. It is a maj water obs having vertical banks and fixed defs on home bank.
 - (2) **Fordwah Branch.** A seasonal irrigation canal, originates from Sulemanki HWs. It runs parallel and close to ESC and provides depth to it.
 - (3) **Malik & Hakra Branches.** At Jalwala HWs, ESC bifurcates into Hakra and Malik Branches, which again are maj obs.
 - (4) **Hakra Rt & Hakra Lt.** At Wallar, Hakra Branch further bifurcates into Hakra Lt and Hakra Rt, and its obs value is reduced.
 - (5) **Bahawal Canal.** Bahawal Canal originating from Islam HW is a complete obs. It provides depth to Marot sec and bifurcates into Desert and Ahmad Pur East Branch at Lal Suhanra Regulator.
 - (6) **Desert Branch.** Originates from the tail end of Bahawal Canal and flows towards south/ SW. At the tail end, Desert Branch is transformed into Dera Nawab Branch. This is the only eff water obs in semi desert sec.
 - (7) Besides these maj obs there are few other water channels in the area which can impede the mov.
- c. **DCBs.** There are 3 x DCBs in 31 Corps AOR as fol:-

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- (1) **Lahura DCB.** It is loc SE of Smk HWs and runs parallel to IB in green belt. It is 31 km long providing fwd most line of def.
- (2) **Murad DCB.** 52 Km long Murad DCB is loc in SW of Dharanwala in the green belt and provides def line ahead of Hasilpur – Islam HWs. It has three segments known as Murad, Chonnawala and Chamruwala ditches.
- (3) **Fort Abbas DCB.** Approx 152 km long having relatively high home bank. It extends from Wallar to Lal Patel and is the main stay of defs in semi desert sec.
- (4) Although the condition of these DCBs has deteriorated over a pd of time, however recently a concerted effort has been put in and they are being revitalized.
- d. **Pondages.** Pondages are primarily loc in the Green Belt. Presently 31 Corps has 11 x Pondages near Smke HWs covering approx 13 sq kms area and is a complete obs for any type of veh mov.
12. **Comm Cens.** Imp towns and comm cens are as fol:-
 - a. In cbt Z, Haveli lakha near Smke, Minchinabad, Bwn, Harun Abad and Fort Abbas.
 - b. In comm Z, Okara, Pakpattan, Vehari, Mailsi and Bwp.
13. **Air Bases.** Air bases in the area are loc at Sgd, Shorkot, Multan, Fsd, Vehari, Bwp and Okara.

Trans-frontier

14. **Topography.** Gen the area extends from Fazilka in the north to Lakhpat in the south. It covers the SW part of Indian Punjab which is well irrigated and the northern part of Rajasthan desert, mostly devoid of any worthwhile vegetation. The area is divided into two lateral halves by the Indra Canal. Imp comm cens in eastern half are Bhatinda, Sirsa and Bikaner. Imp of Bhatinda has inc due to oil pipe line extended from Kandla and Mundra. In western half Fazilka, Abohar, Ganganagar, Hanumangarh and Suratgarh are imp comm cens.

15. **Comm Infra**

- a. India has an extensive comm network opposite 31 Corps AOR especially in the northern part. Maj CL-70 penetrants are as fol:-
 - (1) Fazilka – Malot – Bhatinda.
 - (2) Rai Singh Nagar – Ganganagar – Hanumangarh.
 - (3) Rai Singh Nagar – Suratgarh.
 - (4) Anupgarh – Suratgarh.
 - (5) Beriwal – Bikaner.
 - (6) Pugal – Bikaner.
- b. Maj CI 70 laterals are as fol:-
 - (1) Fazilka – Anupgarh – Pugal.
 - (2) Fazilka – Ganganagar – Suratgarh – Bikaner.
 - (3) Along Indra Canal.
- c. En has a very elaborate Broad Gauge Rly infrastructure, connecting imp comm cens as under:-
 - (1) Suratgarh – Bikaner.
 - (2) Bhatinda – Hanumangarh – Anupgarh – Pugal.
 - (3) Hanumangarh – Ganganagar – Rai Singhnagar.
 - (4) Bhatinda – Malot – Ganganagar.
 - (5) Bhatinda – Abohar – Fazilka.

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16. **Obs & Irrigation Sys.** The only river, which passes through this area, is Ghaggar River. It is now no more than a seasonal nullah especially below Hanumangarh and has been replaced by a network of canals and distributaries. The water in these channels begins to rise by the end of March, reaching max in Jul/ Aug and starts receding in Sep. Imp canals incl:-

- a. **Indra Canal.** It takes off from Harike HWs and flows from north to south. It is perhaps the longest irrigation unit in the world with a length of 850 kms. A CI-70 A2 Rd runs alongside the canal.
- b. **Bikaner/ Gang Canal.** Originates from Hussainiwala HWs and runs close and parallel to Indra Canal up to Fazilka. It is a complete obs.
- c. **Sirhind Feeder.** It flows from Harike HWs, runs close and parallel to Indra canal and terminates near Ganganagar. It is a complete obs.
- d. Other imp water channels are Abohar Br, Bhatinda Br, Bhakra Canal & Ghaggar Canal.
- e. Maj DCBs are loc close to Fazilka, Ganganagar, Srikanpur and Anupgarh.

17. Air fds aval in the area are loc at Bhatinda, Sirsa, Suratgarh, Hisar, Mahajan & Bikanir.

SECRET**Part 2****Cis Frontier Military Aspects**

18. Sequel to discussion on peculiar terrain characteristics, this part will focus on the military aspects of the terrain and its effs on the military operations.

19. **Objs.** In It of the importance of maj towns and BUAs in the realm of psycho / social importance, the likely objs in sub secs are. :-

- a. **In Sulaimanke Headworks to Jalwala Headworks sub sec.** Hasil Saru and Jalwala HWs are the imed objs. While Macleodganj, Mandi Sadiqganj, Minchinabad and Bahawalnagar will be likely tac objs with Pak Pattan as an op obj.
- b. **In Jalwala Headworks to Harunabad sub sec.** Gadhuwala and Gulab Ali HWs are likely imed objs with the view to dev op towards tac objs of Dunga Bunga, Harunabad and op obj of Chistian Mandi.
- c. **In Haroonabad to Wallar HWs sub sec.** Maj BUAs i.e. Chaks on 6 and 7 R are likely imed obj with a view to capture tac objs of Faqirwali and Khichchiwala. The op objs are likely to be Chistian Mandi and Hasilpur.
- d. **In Wallar HW to Rukanpur sub sec.** Wallar HWs, is the imed obj. While Fort Abbas, Marot and Mojgarh are the likely tac objs with the view to dev op towards op obj of Khairpur Tamewali.
- e. **In Rukanpur to Salamsar sub sec.** Bijnot is likely to be the imed obj with Dhori and Khangarh as tac objs. Thereafter, the ops are likely to be dev towards op objs of Channan Pir and Nawakot.

20. **Strat Dir.** As per aval of penetrants in the area of resp, the strat directions affecting 31 Corrps are:-

- a. Ganganagar –Pakpattan.
- b. Suratgarh – Islam HWs.
- c. Bikaner- Bwp.

21. **Strat Dirs.** As per aval of penetrants in the area of resp, the strategic directions affecting 31 Corrps are;-

- a. Ganganagar –Pakpattan.
- b. Suratgarh – Islam HWs
- c. Bikaner- Bwp

22. **Strat Dir - Ganga Nagar-Pakpattan**

- a. The first apch is **Malut – Smke**. It can take an IB. Maj obs along this apch are Lahura Ditch, ESC and R Sutlej. This apch is not suitable for large scale emp of forces due to compartmentation eff.
- b. The second apch is **Ganganagar – Bwn – MMM and Pak Pattan**. The apch can take one to two (1-2) Inf Divs with an Armd Bde. Maj obs along this apch are ESC, Hakra Br, Malik Br, Fordwah Br, Pakpattan Canal and R Sutlej. In this apch, emp of sizeable force (more than an Inf div) is not possible due to ltd x cty mobility.

23. **Strat Dir - Surat Garh – Islam HWs**

- a. The first apch is **Ganganagar-Chistian-Islam HWs**. This apch can take 2-3 Inf Divs with an Armd Bde. Maj obs along this apch are Gang Canal, Hakra Br, Malik Br and River Sutlej. The full cbt power of armr can not be generated along this apch.
- b. The second apch is **Suratgarh-Hasilpur-Islam HWs**. This apch can take 2-3 Inf Divs with an Armoured Div or RAPID Strike. Maj obs along

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this apch are Bahawal Canal, R Sutlej & Mailsi Canal. This apch affords good going with sufficient space for mnvr for armr.

24. **Strat Dir - Bikaner- Bwp**

- a. Its dominan apch is through Bikaner-Pugal-Mojgarh-Yazman-Ahmed Pur East **OR** it can mov to Bwp. The apch can take 2-3 Inf Divs, an Armd Div and a RAPID (S). Maj obs along this apch are Indra Canal, Desert Branch and Ahmedpur Branch.
- b. The apch is the longest apch and passes through the semi desert belt and is suited for large scale mechanized ops. **Pugal** is likely to be dev as maj base of ops. This apch is lengthy and would give sufficient warning time to the defender.

25. **Critical Spaces.** Based on the likely obj zones and the strategic directions, the critical spaces in the area are as fol:-

- c. Smke HWs is critical for con of obs system.
- d. Triple M Triangle Complex.
- e. Bwn – Jalwala Complex.
- f. Space between Latifabad, Dharanwala and Fort Abbas is critical for defensive battle as its capture provide multiple options to India.
- g. Space between Islam HWs, Takhtmahal and TLB is critical for induction of strat res and counter offensive.
- h. Marot Complex.
- i. Mojgarh Complex.

26. **Lines of Def**c. **Green belt**

- (1) Line A along IB.
- (2) Line B along along ESC and Hakra Canal.
- (3) Line C along Fordwah Canal.

b. **In Semi Desert / Desert Belt**

- (1) Line D along Marot – Lal Patel.
- (2) Line E along New Line of Def (ahead of line of old forts).

27. **Strat Posture.** Keeping in view of the likely obj zones, aval of lines of def and number of obs, likely strat posture of the defender would be as fol:-

28. North of Fort Abbas, there is an option to either take up forward or rearward defensive posture. A number of imp comm centres in close proximity to the border dictate a forward defensive posture. However, in the north, critical importance of Sulemanki Head Works should dictate exaggerated fwd def posture, while in South of Fort Abbas, non aval of any worthwhile line of def and obs dictate rearward def posture as an appropriate measure to absorb and attrite India's mech forces.

29. **Type of Op.** Except for the area between Sulemanki, Bahawalnagar and Dunga Bunga which does not facilitate armour ops, the whole area is ideally suited for mechanized ops.

30. **Conclusions**

- a. Xings over R Sutlej assume critical imp for log sp and mov of res.
- b. Reliance on a single link between rly lines in cbt and comm Z through Empress Brs at Bahawalpur is a serious vuln for our log, mov and assy
- c. **Green Belt**
 - (1) The Green Belt is relatively more defensible due to numerous/successive lines of obstacle almost parallel to the border.

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- (2) River Sutlej, different canals and pondage schemes in the area are effective obstacle to any cross country movement by mech forces.
- (3) North of Fort Abbas, a no of obs provides the option to take up fwd or rearward def posture. However, presence of Smke HWs in the northern sub sec forces adoption of exaggerated fwd def posture.
- (4) The Green Belt with extensive network of canals and distys, water logging, narrow sub corridors and boggy area is suitable for inf biased ops.
- (5) Rd Jalwala HWs - Bahawalnagar is a narrow stretch of 30 km. With respect to alignment of R Sutlej, Bwn is critical choke pt, its isolation / investment or threat will cause isolation.

d. **Semi Desert Belt**

- (1) Offn launched astride Fort Abbas likely to turn defs and sever MSR to Fort Abbas hence likely to be held in str.
- (2) Semi Desert Belt provides good going with ample spaces for mnvr west of Line Chammruwala - Quraish and is suitable for mech ops. However, ltd comm infrastructure will pose log problems.
- (3) Water table is generally low thus no water logging and salinity exists in the area. Inundation by breaching water channels will also be very difficult.
- (4) Fort Abbas – Lal Patel DCB is the mainstay of the obs system in the semi desert belt. The cultivation drive in the area enabled by Solar TWs is fast changing the landscape of this belt especially near Marot, Mansura till Mojgarh. This necessitates review of def lines and obs system

e. **Desert Belt**

- (1) Mov of A & B vehs is possible along existing trs. However, sustained veh mov will entail treatment of these trs thus requiring hy expedients.
- (2) Prime desert South of Winjor upto Salamsar inhibits generation of a maj offn effort, as high terrain friction makes it difficult to sustain large forces.
- (3) Const / dev of new trs in the area will req extensive engr effort and large qty of tr expedients like duck boarding etc thereby affecting the speed of ops and log sustenance.
- (4) Mov across the IB and along most of the trs is difficult due to presence of sand dunes, which cuts across the grain and the ridges dominate the apchs coming from the India (from East / South East). Mov towards North is also difficult due to natural slope of the area.
- (5) The movement of troops is generally restricted to darkness due to lack of cover against air. In addition, track marks of any sizeable movement are clearly visible from air. Thus, local air superiority is an essential pre-requisite for any attacking force.
- (6) The absence of vegetation and lacks of natural cam and clt. necessitate greater dispersion however it will pose pronounced sustainability challenges.

SECRET**Part 3****Trans Frontier Mil Aspects***"Know the en, know the terrain and victory will be total"***Sun Tzu**

31. **Gen.** In this sec, salient aspects of threat shall also be discussed along with trans frontier mil aspects.
32. SWC known as Sapta Shakti meaning the Seventh Star, became fully operational on 15 August 2005 and is Headquartered at Jaipur, Rajistan. Lt Gen Alok Singh Kler (AC) is the the present Comd since Sep 2019. The AOR of SWC is from including Fazilka to including Bikaner covering frontage of 371 kms.
33. SW Comd has 2 x Corps on its Orbat. 10 Corps is Pivot Corps and 1 Corps is strike Corps.
- 10 Corps is loc at Bhatinda. It includes:-
 - 16 Inf Div, Comprising 4 x Inf Bdes, responsible from area including Fazilka to incl Suratgarh, whereas 24 RAPID (D) has been asg the area from excl Suratgarh to incl Bikaner.
 - 18 RAPID (D) is loc at Kota. 6 IAB, the Corps Res at Suratgarh.
 - The offn punch of SWC is 1 Corps, loc at Mathura. It comprises 33 Armd Div, loc at Hissar, 14 IAB loc at Bhatinda. 4 RAPID (S) is at Paryag Raj and 23 Inf Div at Ranchi.
 - Mahajun Fd Fire range is main trg area of SWC, located just 52 Km from intl bdr. Apart from trg, presence of Armr, arty and Inf elms throughout the yr, projects a continuous ththreat.
34. **Corelation of Forces.** Armr ratio is 1.6:1, whereas for Inf it is 1.7:1. Inf ratio substantially increases after aval of 2 - 3 ID ex EC.
35. **Changes in Force Config –SWC.** Few changes in force configuration have taken place. 18 RAPID (Def) and 4 Inf Div have been converted into RAPID (Strike) respectively. Lately three Armd Bdes have also been reloc to fwd cants.
36. **Relocations.** This Relocation of 3 x ABs has significantly reduced time required for mov and assy and appln of IBGs.
- 150 AB ex 18 RAPID (S) has been reloc from Hissar to Lalgah Jattan, reducing the distance of 233 kms and one day travel time.
 - Similarly, 180 AB ex 24 RAPID (D) has been reloc from Udaisar to Suratgarh, reducing the distance of 433 kms.
 - 62 AB ex 4 RAPID (S) less 2 x MIBs reloc from Faizabad to Suratgarh, reducing the dist of over 1000 km and three days travel time.
37. **Likely Formulation of IDPs, IBGs and TFRs.** Having seen the orbat and depl, SWC has the offn potential to launch 2-3 IBGs and a TFR along 2-3 Thrust lines. However, despite fwd reloc, no major change in timeline of offn is likely to take place owing to late arrival of 23 Div, which takes around three days to complete its mov.
38. **Critical Areas for cfm of Strat Direction of Strike Corps.**
- From Hisar, xing of either Sirsa, Rawalsar and Sardar Sheher would ascertain Strat dir of Strike Corps to Bikaner, Bhatinda or Surat Garh,
 - Which are critical for Strike Corps mov & assy and confirmation of 31 Corps H.
39. **TRANSFRONTIER TERRAIN ANALYSIS.** Coming over to brief overview of Transfrontier terrain analysis.
40. **Obj Zones.** Basing on psy-social importance of major towns, the likely obj zones will be ident in three sub-sectors.

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- a. In Fazilka to Abhor Sub-sector, Br H over DCB, Eastern Canal and Gang Canal & capture of Hindumalkot are imed ojs.
 - b. While Fazilka, Killianwala, Dharmapura are likely ojs in tac depth and Abohar in op depth.
 - c. In Ganganagar to Anupgarh Sub-sec, Karanpur, Raisingnagar and Anupgarh are likely imed objs with a view to dev ops towards Ganganagar Padampur & Srivijaynagar in tac depth and Suratgarh in op depth.
 - d. In Khajuwala to Sachu Sub-sector, Khajuwala and Beriwal are likely imed ojs whereas Ranisar lies in tac depth to dev ops towards Pugal in op dept
41. **Critical Spaces**. Based on likely obj zones, the likely critical spaces in the area are,
- a. Fazilka is critical owing to its proximity of intl bdr and to retain offn option against Sulemanki.
 - b. Kallianwali -Dharmapura-Abohar is critical for defensibility of Abhor as its capture would provide multiple options to the Pakistan's offn in this area.
 - c. Space b/w Karanpur-Ganganagar-Padampur is req to be retained for defensibility of Ganganagar.
 - d. Space b/w Raisingpur-Anupgarh-Sri Vijay Nagar is essential for defensibility of Suratgarh and dev of offn ops.
 - e. Ranisar-Pugal complex would deny any further ops towards Bikaner.
42. **Strat Dirs**. Based on these objs and the avail penetrants, the likely strat dirs. Affecting SWC are Pakpatan-Bhattinda, Hasilpur-Suratgarh and Bwp – Bikaner.
43. There are two apchs in strat dir of Pakpatan-Bhattinda:-
- a. Sulemnaki – Fazilka Apch.
 - b. MMM – Abohar Apch.
 - c. Fazilka Apch can take 1 x inf Div with an Armd Bde and maj obs are DCB and Eastern Canal
 - d. While the capacity of Abohar Apch remains the same, large scale mech mnvr remain ltd.
44. There are two apchs in strat dir of Hasilpur-Suratgarh:-
- a. Hnd – Ganganagar Apch.
 - b. Fort Abbas – Suratgarh Apch.
 - c. Ganganagar Apch can take 1-2 Inf Div with Armd Bde, Gang Canal is only obs, wherein cty side is wide open and sufficient space for mnvr is avail.
 - d. Suratgarh Apch can take an Armd Div with 2-3 Inf Divs and served with well dev comm infra.
45. The maj apch in strat dir of Bwp – Bikaner is Mojgarh –Pugal Apch with capacity of Armd Div and 2-3 Inf Divs. It is characterized by poor comm infra, making log sp difficult and higher sand dunes restricting mob.
46. **Concls**
- a. Owing to close proximity of imp comm cns to intl bdr and terrain friction, ops would be ltd in scale and inf hy from Fazilka to Ganga Nagar. This area is likely to be defended strongly.
 - b. Whereas, from Ganganagar to Anupgarh, space is relatively open and afford large scale mech ops. Initial loss of spaces can be regained by retention of pivots of mnvr and ctr actions.

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- c. From Anupgarh southwards, prime desert and open spaces, provide adv to def by gaining time to stretch offn & dissipate cbt power. Ops in desert sec would be log hy.
 - d. **Strat Posture.** While the strat posture of SWC mainly remains offn however, from def pt of view, exaggerated fwd def posture in Fazilka. Fwd def posture till Anupgarh and Rearward def posture based on Indra Canal and def nodes South of Anupgarh.
 - e. **Obs Sys.** All apchs covered by obs - Gang and Indra Canals run parallel to IB -provide formidable def lines, req maj effort to breach
 - f. **Comm Infra.** Improvement in comm infra has considerably enhanced Indian cap to assemble and sp forces both for def & offn ops
 - g. **Emp of Air.** Seven air bases/FOBs in SWC AOR and their proximity to the zone of ops provide mk adv in emp of air.
47. Nature of terrain affords less cover from air threat, necessitating aerial protection of forces – demands GABD and Air cover.

SECRET**Part 4****Op Significance**

48. **Op Linkages.** South of Sutlej is of particular importance to India as it affords large scale employment of mechanized forces, for which adequate transfrontier communication infrastructure has been developed. The strategic effects of effort in this sector can be maximized through complementary or sp efforts in the contiguous zones. Capitalizing on ascendancy in air, mechanized forces, strategic and operational surveillance capabilities, SWC can execute swift maneuvers in this area for significant gains. Conversely, in this sec, Pakistan also retains option for employment of Army Reserve South as Strategic Offensive.

49. Therefore, Zone being central remains a preferred option for a major effort by the Indian army, in comb with efforts in the WC and SC. This also highlights the dilemma for 31 Corps, that any setback in this area will cause pull on resources of 5 Corps in South and CC in North including pull on ARS by causing distraction. In context of SWC, the offn forces are so disposed in time and space, that IBGs in 31 Corps AOR can be launched with min displacement in 2/3 days. SWC also retains flexibility for appl of TFRs in contiguous Zs i.e. in RSC or Desert. Though, SWC is likely to aim at compressing the space to curtail liberty of action of ARS.

50. **Op Dynamics**

- a. The essence of success of PAO is in exploitation of relative unpreparedness of defensive maneuver. SWC is likely to generate offensive by projecting mech forces in the critical spaces to minimize org resistance and application of reserves. This can best be achieved by impeding the mobilization of 31 Corps and ARS.
- b. Even in a pro-active scenario, when FL seizes the initiative of mobilization first, the close proximity of peace time loc of 31 Corps fmns, afford it the advantage of timely deployment which stresses the application of SWC's offensive maneuver.
- c. Variation in def posture affects the speed of operation of offn forces as it would pose challenge of maintaining synchronized tempo of operations between efforts in green belt and semi desert / desert sub sectors. This affords 31 Corps to hasten offensive efforts' culmination point by capitalizing on strength of obstacles and mechanized reserves' potential.
- d. ARS strength lay in force projection and flexibility in employment. However, psycho – socially important objectives in SWC AOR are in the center and northern sector. This necessitates 31 Corps to articulate defensive maneuver so that conditions for application of ARS are created. For SWC, this will pose challenge in articulation of balanced offensive and defensive maneuver.
- e. Though 31 Corps is well configured for the task, yet, vulnerabilities at the seam and sensitivities on the limbs can be exploited by SWC through swift maneuvers by capitalizing her strengths of pivot corps, force multipliers and advantage in air and mechanized force.

51. **Key Battle Areas.** In case of TFR 2's appl in 31 Corps AOR, key battle areas are as following:-

- a. **Green Belt.** Area Bahawalnagar - Minchinabad - Jalwala HWs.
- b. **Semi Desert.** Area Khairpur - Marrot – Wullar HW / Fort Abbas.
- c. **Desert.** Area Mojarh - Derawar Fort - Rukanpur.

SECRET

52. **Air Ops.** The air fields on both sides have considerable importance for mobilization and defensive / offensive maneuvers of respective forces. Therefore likely to be accorded higher pri in targeting while bridges, logistics installations, mechanized forces and economic potential remain vital targets. Key zones of air operations would be Ganga Nagar – Bhattinda, Suratgarh – Hisar and Pugal – Bikaner in SWC while in 31 Corps AOR, these would be Bahalpur – Multan, Bahawalnagar – Vehari and Sulemanki – Okara.

53. **Op Log**

- a. 31 Corps logistics infrastructure has FADs at Chishtian, KPT and Bahawalpur, while ammo depots are at Khanewal, Okara and POL / Sup depots are at Bahawalpur, Multan, Bahawalnagar. Interdiction of infrastructure at these locations will degrade cbt potential of 31 Corps and ARS.
- b. In SWC, comd log installations are at Fazilka, Abohar, Sadhuwala, Ramsara, Sri Karanpur, Zorawarpur, Raisinghnagar, Anupgarh, Nanuwala and Chattargarh. FAD for 1 Strike Corps is at Lalgah Jattan. Base maintenance areas are at Bhattinda, Ganganagar, Surat Garh, Hanumangarh and Bikaner. This indicates that log is poised for mnvrs in green belt and seme-desert sub sec. Therefore, gen offn in desert sec within this zone would req considerable efforts for log build up. Moreover, intd of logistics installations at these locations will degrade cbt potential of SWC.
- c. Besides above, oil pipeline between Mundra (largest pvt port in India) and Bhattinda is vital for sup of oil in the region and towards North. Besides mil effs, intd of this pipeline and oil refinery at Bhattinda will have eco effs on India.

54. **Conclusion.** The need for formulation of crystallized concls and the requisite proficiency in op planning, demands three things. An in-depth study of terrain, a precise understanding of environment and the ability to estb the correct and sound relationship of these two with en and own factor. This study, at best is an attempt towards laying a broad basis for the first aspect only ie. study of terrain. With equally deliberate effort on the other two aspects mentioned above, meaningful planning results would be achieved.