# GHAR GHAR MAA SWASTHYA

## Training Report- Demand Estimation and Inventory Analysis of Nepal CRS Company

## Submitted by: MART India

## USAID Contract No: AID-367-C-10-00001

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This report is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents of this report do not necessarily reflect the views of USAID or the United States Government.

2014

# Enabling CRS

## TRAINING & HANDHOLDING UPDATE DOCUMENT FOR DEMAND ESTIMATION & INVENTORY MANAGEMENT

BENJAMIN MATHEW

# ENABLING CRS

## BACKGROUND

CRS started in 1978 as the Nepal Contraceptive Retail Sales Project, a joint collaboration between the Government of Nepal, USAID, and Westinghouse America. In 1983, this project was converted into a non-profit company called Nepal Contraceptive Retail Sales Company Pvt. Ltd. CRS has grown steadily since 1978 and contributes more significantly each year to national family planning and public health efforts.

The company has pioneered social marketing approaches and established itself as a leading public health organization in Nepal. CRS has become synonymous with family planning and its condom brand, Dhaal Deluxe, synonymous with condoms. The organization has created strong brand equity among various stakeholders and the public at-large. It now markets a portfolio of 13 products, and its sales network reaches into all 75 districts of the country. The 2011 Nepal Demographic Health Survey reported that one in four Nepalese using a reversible form of birth control and 66% of those using oral contraceptives were using CRS products.

The vision of CRS is to build a healthy future for the people of the Nepal, operating as an efficiently run social marketing enterprise implementing marketing and communication programs in collaboration with the Government of Nepal, international non-governmental organizations, national non-governmental organizations, and donors. The CRS Mission is to enable the poor and underprivileged to build a healthier future for themselves by making family planning, HIV/STI prevention, and maternal and child health products and services more accessible and conducting behavior change communication programs to create awareness and increased use of these products and services.

## DISSEMINATION

MART was contracted with the project – Distribution Improvement at CRS, Nepal in month 2013. Following modules were identified for the successful completion of the project.

1. Supply chain and inventory management
2. Margin structure and sales target review
3. Demand Forecasting
4. Knowledge dissemination and handholding

MART team disseminated to CRS the above modules in the following dates as a measure for the above 4th deliverable

1. In Nepal from 24th to 30th November 2013 – Overview of Supply Chain & Inventory Management
2. In Nepal from 5th January to 10th January 2014 – Sales Target Assessment & Review
3. In Nepal from 17th March to 21st March 2014 – Demand Forecast from Consumer Side

This document provides a brief overview CRS handholding through training and support.

## PROCESS

The process followed was intense engagement via classroom sessions with the CRS steam. The following teams made up for the training and Handholding sessions.

## SUPPLY CHAIN MANAGEMENT

The team consisted of Mr. Mahesh, Mr. Neeraj and Mr. Kafle. These three staff members comprise the sales core team at CRS. It was also proposed that the one of the team members from marketing department should also be part of the supply chain management but due to work limitations, they were not able to attend.

The sessions laid the following format for the understanding of the supply chain within CRS

1. Theoretical aspect of the supply chain
2. Principles and definitions
3. Core understanding of CRS supply chain
4. Data mining, structuring and labeling
5. Mathematical concepts & calculations
6. Analysis and Interpretations
7. Graphs, Charts and Layouts
8. Decision making Process

The team was support by a series of mock and actual working scenarios as practice sessions. To further improve the learning process, a project of same nature was internally shared by the sales team to each regional manager to work on local numbers and revert with the above structure.

## SALES TARGET ASSESSMENT & REVIEW

The team consisted of Mr. Mahesh, Mr. Neeraj and Mr. Kafle. These three staff members comprise the sales core team at CRS. Based on the learning from the inventory management modules it became evidently clear that sales targets could be substituted for the actual sales to understand various impact and scenario.

Such analysis were shared and the team worked on different targets take for the years to build the consolidated understanding of the targets and how it practically needed to be set using the supply side of the CRS. There was a general consensus of the sales core team to understand and get sensitized on the various aspects of inventory and pass down the information to the regional managers, sales officers and others in the system to get accustomed to the process.

## DEMAND FORECAST FROM CONSUMER SIDE

The team consisted of Mr. Mahesh, Mr. Neeraj, Mr. Uttam, & Mr. Amit. These initial two staff members comprise the sales team at CRS and rest of the two comprised the team from marketing team at CRS. Marketing team's involvement will be essential during the next phase of the project which focuses on demand forecasting. It was imperative that singular ownership for each function, mainly, inventory management and demand forecasting be taken up by sales and marketing teams respectively.

The sessions laid the following format for the understanding of the consumer side of looking at Demand

1. Understanding Demographics Information and Data
2. Accessing Multiple Sources of Data available
3. Theoretical frame of Demand and its Potential
4. Layer of Demand – Universe, Potential, Accessible, Achievable
5. Analysis of the demand – Users and Frequency
6. How it connect to targets

The classroom sessions involved MART team sensitizing and introducing concepts to the team. Considerable amount of exercises were given to the sales team for completion. Following day comprised of discussion of the work assigned to the sales team and analysis of the data.

END of DOCUMENT

# Demand Estimation

## THE BRIEF CONSUMER SIDE STORY FOR CONDOMS

Benjamin Mathew | Document Version 1.40 dated 22nd May 2014
MART | A-6, FIRST FLOOR, LANDMARK BUILDING, SECTOR-2, NOIDA, UTTAR PRADESH – 201 301

# Demand Estimation

## Synopsis

Organization often spends a considerable amount of money in order to determine demand that the public has for its products and services. Incorrect estimations will either result in money left on the table if it's underestimated or losses if it's overestimated. This requires a business firm to use authentic data and process for demand estimation to bring the projections and estimates closer to conceptualized demand estimation based on CYP data for country mentioned in Source **Book District and VDC profile of Nepal – 2010 published by Intensive Study and Research Centre, Putalisadak, Kathmandu, Nepal**.

The demand estimation rational has many approaches. As for the CRS products, each product would require a different logic and construct of the demand estimation. The rational is built on the following grounds

1. Estimate should be close to market reality and achievable
2. It should pave the way for future path to be treaded based on assumptions.
3. It should give insights into distribution enhancements or marketing supports integrating functional components.
4. Help plan for the future.
5. It should be logical and simple to arrive and calculate

The quantity of commodities required to protect each user is normally estimated for a one-year period. Again, this quantity is called the couple-years of protection (CYP) conversion factor—the amount of a particular contraceptive needed to provide one couple with protection for one year. Table shows the CYP standards established by USAID's EVALUATION Project. Although both the CYP concept and CYP conversion factors have been used for program evaluation for decades, there is still controversy regarding application of the factors for certain purposes. In particular, establishing the exact quantity of a given contraceptive required to protect one couple for one year from an unwanted pregnancy is problematic for many contraceptive methods. Use of the standard factors from table is likely to be acceptable for orals and injectable, because the CYP factor is very closely associated with the menstrual cycle, and there is little variation from woman to woman or country to country.

| Method | CYP |
|---|---|
| Oral contraceptives | 15 cycles/CYP |
| Condoms | 120 pieces/CYP |
| CuT 380A IUDs | 3.5 CYP/insertion |
| Injectables<br>Depo-Provera®<br>Noristerat<br>Cyclofem | <br>4 doses/CYP<br>6 doses/CYP<br>12 doses/CYP |
| Vaginal foaming tablets | 120 tablets/CYP |
| Norplant® | 3.5 CYP/implant |

For barrier methods, however, there is great variability from person to person and place to place, and few hard data on which to base CYP factors. The standard for condoms and foaming tablets assumes 120 acts of vaginal, protected intercourse per year, and that the two methods are not used together. It further assumes an unspecified level of client wastage. These are difficult assumptions to prove or disprove. It is known that the frequency of sexual relations varies from culture to culture and individual to individual. Moreover, many users combine condoms or spermicides with the rhythm method or withdrawal, or with sexual techniques other than vaginal coitus. Condoms used to prevent HIV/AIDS or other sexually transmitted diseases are often estimated separately. Moreover, more than one method may be used simultaneously, either for backup or, in the case of condoms, for disease prevention. The standard CYP factors do not automatically account for such variations.

For these reasons, the authors of the CYP methodology indicated explicitly the need to conduct country-specific user surveys to establish CYP factors. Use of local data for conversion factors can improve the quality of the forecast for barrier methods. Unfortunately, such data are rarely available, so the forecaster normally has to use the standard factors from above CYP table

Below are two methodologies based on secondary data[1] and CRS data? This method explains the possibilities with condom demand. Base year of data is taken as of 2010.

[1] Source data taken from Book District and VDC profile of Nepal – 2010 published by Intensive Study and Research Centre, Putalisadak, Kathmandu, Nepal

| CYP & Volume | CYP 2010[2] | Contribution |
|---|---|---|
| Mid-Western Region | 57265 | 28% |
| Far West Region | 19844 | 10% |
| Eastern Region | 28768 | 14% |
| Central Region | 47826 | 23% |
| Western Development Region | 54010 | 26% |
| Total | 207713 | 100% |

# Universe & Share

## Estimated Universe of Consumption

CYP figures for 75 districts are available in the source document of District and VDC profile of Nepal -2010, hence using the core data available we can calculate no. of units sold at each district. The basic assumption is that the CYP number remains constant.

**CYP = No. of cycle sold and distributed[3] (Y)/120** on reversing the equation

**No. of units Sold and Distributed(Y) = CYP × 120 ……equation 1**

CYP achieved by free distribution, commercial sale of condoms by Government, NGO's & INGO's and private players in Nepal is 207731 as per data mentioned in District and VDC profile of Nepal -2010. Here number of condom units sold or distributed free can be calculated by putting CYP value in equation 1.

**No. of condom units Sold and Distributed (Y) = 207731 × 120 = 2,49,25,560 units approximately 25 million Units**

The above number gives the user the total consumption of condom units in the whole country based on 120 CYP. It takes into account the actual consumption throughout the year and proportion of stocks lying in the channel.

## CRS Universe of Consumption

Total sales of Dhaal and Panther achieved between 17 July, 2010 to 16 July, 2011 in Nepal by CRS is:

**Dhaal = 81, 90,595 + Panther = 56, 90,368**

**Total = 1,38,80,963 units approximately rounded off to about14 million Units**

## Market Share Held by CRS

The percentage of an industry or market's total sales that is earned by a particular company over a specified time period. Market share is calculated by taking the company's sales over the period and dividing it by the total sales of the industry over the same period.

This metric is used to give a general idea of the size of a company to its market and its competitors. To determine percentage contribution of CRS towards aggregate condom units sold or distributed free by different entities (Government, NOG's & INGO's and private players) in market, which is more appropriately termed as market share for CRS for condom can be calculated as -

**CRS condom market Share would be =Total no. of units sold by CRS ÷ No. of units sold/distributed……equation 2**

**= 1,38,80,963 / 2,49,25,560**

**= 55.69 %**

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[2] Data based on primary research work mentioned in the source above…for CRS actual achievement.

[3] We use word sold and distributed to include the channel and the consumer for the pertinent year and not the product lying with the companies yet to be billed.

# Gauging Potential

## Highest Possible Potential

It is important to understand the universe of its product that could be sold in company's operating area. Therefore, total market potential for condoms can be more appropriately defined as "if total reproductive active (15-49) population of Nepal uses 120 units of condom in year the resultant requirement of condoms can be said as total market potential or universe for condom.

To conclude total market potential we should know current Demography of Nepal, which is available in district and VDC profile of Nepal – 2010 published by Intensive Study and Research Centre, Putalisadak, Kathmandu, Nepal. Total reproductive active population at 75 districts is given in table below:-

| S.no | District | Male Population (14-49) | S.no | District | Male Population (14-49) |
|---|---|---|---|---|---|
| **1** | Banke | 123982 | 38 | Taplejung | 1426 |
| **2** | Dolpha | 6666 | 39 | Sankhuwasabha | 2380 |
| **3** | Jumla | 19603 | 40 | Solukhumbu | 910 |
| **4** | Kalikot | 3853 | 41 | Panchthar | 2416 |
| **5** | Mugu | 11075 | 42 | Ilam | 2408 |
| **6** | Humla | 11442 | 43 | Dhankuta | 2806 |
| **7** | Pyuthan | 43322 | 44 | Therhathum | 1828 |
| **8** | Rolpa | 49530 | 45 | Bhojpur | 3018 |
| **9** | Rukum | 55077 | 46 | Okhaldhunga | 1460 |
| **10** | Salyan | 17399 | 47 | Khotang | 2086 |
| **11** | Surkhet | 77726 | 48 | Udayapur | 2214 |
| **12** | Dailekh | 52550 | 49 | Jhapa | 25698 |
| **13** | Jajarkot | 39338 | 50 | Morang | 8618 |
| **14** | Dang | 133956 | 51 | Sunsari | 7310 |
| **15** | Bardiya | 115220 | 52 | Saptari | 7082 |
| **16** | Bajura | 2198 | 53 | Siraha | 6832 |
| **17** | Bajhang | 1578 | 54 | Dolakha | 1476 |
| **18** | Darchula | 1286 | 55 | SindhupalChok | 1448 |
| **19** | Achham | 3040 | 56 | Rasuwa | 1162 |
| **20** | Doti | 3416 | 57 | Sindhuli | 1930 |
| **21** | Dadeldhura | 2246 | 58 | Ramechhap | 1566 |
| **22** | Baitadi | 3952 | 59 | Kavrepalanchok | 4046 |
| **23** | Kailali | 14354 | 60 | Lalitpur | 4070 |
| **24** | Kanchanpur | 7610 | 61 | Bhaktapur | 1416 |
| **25** | Manang | 254 | 62 | Kathmandu | 4872 |
| **26** | Mustang | 430 | 63 | Nuwakot | 2500 |
| **27** | Gorkha | 2172 | 64 | Dhading | 4620 |
| **28** | Lamjung | 3386 | 65 | Makwanpur | 3466 |
| **29** | Tanahun | 2936 | 66 | Dhanusha | 8554 |
| **30** | Syagja | 2566 | 67 | Mahottari | 5918 |
| **31** | Kaski | 4854 | 68 | Sarlahi | 5496 |
| **32** | Myagdi | 2894 | 69 | Rautahat | 6054 |
| **33** | Parbat | 1910 | 70 | Bara | 5890 |
| **34** | Baglung | 2894 | 71 | Parsa | 4452 |
| **35** | Gulmi | 4344 | 72 | Chitwan | 26372 |
| **36** | Palpa | 12228 | 73 | Nawalparasi | 9790 |
| **37** | Arghakhanchi | 3238 | 74 | Rupandehi | 4868 |
| **75** | Kapilbastu | 5426 | **Total** | | **6640421** |

For argument sake we have generally classified the productive population in the age group of 14-49. However we may see this bracket in many documents being taken largely for the female productive population. In the USAID document on demand forecasting the productive population of male is taken in the age group of 15-59 with a caveat of the word "usually". To the reader of this document the both the parameters are correct that 14-49 and 15-59 but depends upon what the user wants it to be. The above table is shown to extract the logic and therefore if the age group moves up to 59 then then are more number simply need to be added in the above data.

Total number of reproductive active population in Nepal is 6640421, hence to possible number of units of condom can be sold or distributed free could be calculated as shown below:-

**Total Market potential for condom = 6640421 × 120**

**= 79,68,50,520 units that means if everything is perfect then the maximum attainable potential is 80 million units a year**

The general principle we used here is the user of the category is the male and it can presumably be used in couple situation or occasional partner situation, however we have assumed both to be at the highest theoretical probability which is 120. Therefore 100% of male in the productive use the condom as per prescribed frequency of 120 irrespective of the couple or any other form would yield the maximum attainable scenario, which we call potential – 100% awareness, usage and frequency.

## Accomplishable Market

Accomplishable market is more rational approach for a company, it is possible condom units that can be sold to current condom using population in country. Before moving ahead we must know current condom using male population which is available from book District and VDC profile of Nepal – 2010 published by Intensive Study and Research Centre, Putalisadak, Kathmandu, Nepal.

| S.no | District | Male Population (14-49) | S.no | District | Male Population (14-49) |
|---|---|---|---|---|---|
| 1 | Banke | 9564 | 38 | Taplejung | 1426 |
| 2 | Dolpha | 672 | 39 | Sankhuwasabha | 2380 |
| 3 | Jumla | 1920 | 40 | Solukhumbu | 910 |
| 4 | Kalikot | 1486 | 41 | Panchthar | 2416 |
| 5 | Mugu | 544 | 42 | Ilam | 2408 |
| 6 | Humla | 642 | 43 | Dhankuta | 2806 |
| 7 | Pyuthan | 9050 | 44 | Therhathum | 1828 |
| 8 | Rolpa | 5658 | 45 | Bhojpur | 3018 |
| 9 | Rukum | 1110 | 46 | Okhaldhunga | 1460 |
| 10 | Salyan | 2558 | 47 | Khotang | 2086 |
| 11 | Surkhet | 7752 | 48 | Udayapur | 2214 |
| 12 | Dailekh | 5504 | 49 | Jhapa | 25698 |
| 13 | Jajarkot | 1970 | 50 | Morang | 8618 |
| 14 | Dang | 6556 | 51 | Sunsari | 7310 |
| 15 | Bardiya | 8498 | 52 | Saptari | 7082 |
| 16 | Bajura | 2198 | 53 | Siraha | 6832 |
| 17 | Bajhang | 1578 | 54 | Dolakha | 1476 |
| 18 | Darchula | 1286 | 55 | SindhupalChok | 1448 |
| 19 | Achham | 3040 | 56 | Rasuwa | 1162 |
| 20 | Doti | 3416 | 57 | Sindhuli | 1930 |
| 21 | Dadeldhura | 2246 | 58 | Ramechhap | 1566 |
| 22 | Baitadi | 3952 | 59 | Kavrepalanchok | 4046 |
| 23 | Kailali | 14354 | 60 | Lalitpur | 4070 |
| 24 | Kanchanpur | 7610 | 61 | Bhaktapur | 1416 |
| 25 | Manang | 254 | 62 | Kathmandu | 4872 |

| | | | | | |
|---|---|---|---|---|---|
| **26** | Mustang | 430 | 63 | Nuwakot | 2500 |
| **27** | Gorkha | 2172 | 64 | Dhading | 4620 |
| **28** | Lamjung | 3386 | 65 | Makwanpur | 3466 |
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| **36** | Palpa | 12228 | 73 | Nawalparasi | 9790 |
| **37** | Arghakhanchi | 3238 | 74 | Rupandehi | 4868 |
| **75** | Kapilbastu | 5426 | **Total** | | **341154** |

In the year 2010, the total condoms sold in the market was roughly 25 million units. This 25 million units were used by a certain number of the male population. Based on the detail given in source book, we have assumed that user uses condom on every copulation i.e. 120, hence the possible accomplishable market for CRS could be,

**Accomplishable Condom Market:-Total condom user in Nepal × 120**

**Total Condom user = 341154,**
**CYP per unit for condom = 120**
**Accomplishable Market potential = 341154 *120 = 40938480 units……equation 3**

That is approximately 40 million units based on the same assumption that the current users are perfect users and they will use 120 occasion per year and there are no other competition for CRS in the market then the above is most logically accomplishable number as on date by CRS. This number is the ideal number for CRS however reality is vastly different. Let's take a closer look at the number and see what insights it reflects.

## Addressable Demand

Addressable demand thus captures the gap that exist between currently units sold or distributed to the units distribution that could be accomplished, which can be derived from subtracting equation 3 from equation 1. Achieving these numbers is idealistic situation for a company, to know accomplishable market one must know current condom using population in the country. This bring us to couple of interesting conclusions – what is the potential demand that CRS can look in the coming year.

1. **Highest Possible Potential : 80 Million condom units (Perfect Situation)**
2. **Accomplishable : 40 million condom units (Ideal Situation)**
3. **Reality Scenarios : 25 Million Condom Units (Real Situation)**

The next big question comes is what is that I can look for in this scenario, and how am I going to look at the outcomes better suited to my way of working. **What demand can I address?**

**Addressable Demand =Accomplishable Market – Currently Served Market ……..equation 4**

**= 40938480 – 24925560 = 16012920 or approximately 16 million units**

This is the best possible demand that CRS and the other market players together can address in the coming years. Taking a definitive understanding from the CRS journey of 14 million units roughly took 30 odd years to build. But given the pace and the experience the 16 million bait should be a journey of 7-10 years at the maximum. When this addressable demand is broken on a year on year basis then the opportunities can be looked at in the following manner.

# Insights & Approach

## Frequency

From above discussion, we can also conclude frequency of condom usage by reproductive active male population who prefer to use condom as contraceptive methods. This can be determined as,

| | |
|---|---|
| **Total Number of condom user in country** | **= 341154** |
| **Total no. of units distributed or sold by various entities in country** | **= 24925560** |
| **Frequency of condom usage** | **= 24925560/341154** |
| | **= 73 Units** |

Here, we reach to conclusion that a reproductive active male uses 73 units of condom in a year. This also means that the efforts of CRS and other both in terms of marketing, communication, media and distribution has been able to achieve a frequency of 73 units per user in a year. The frequency will be inversely proportional to the user that means lower the frequency higher the possibility of the users.

In fair assumption we can say that the following logic understanding works

1. The users are inversely proportional to the frequency of usage
2. There is a possibility of user coming into the market and then going off, another user may be coming in lieu of the first. In this case then the frequency drops to half and the user doubles
3. This also gives an indication that it would be a very slow process of frequency building, starting with new consumers.

## Approach

This entire calculation give out scenario of demand side addressable from two different sides.

**Scenario 1**

| | | |
|---|---|---|
| **Total condom sold in Nepal by CRS** | **=** | **1,38,80,963 Units** |
| **Possible User of CRS** | **=** | **341154*55.61% = 189716** |
| **Avg Usage of Condom in a year** | **=** | **1,38,80,963 ÷ 189716 = 73 Units in a Year** |
| **Market Potential** | **=** | **73 to 120 usage per on same consumer that is 8 million** |

In this scenario an additional 8 million units potential for CRS exists with the same user base by increasing the frequency of usage. This unit's potential will be further broken up into number of years, then further by region, district and VDC based on their contribution to national sales.

**Scenario 2**

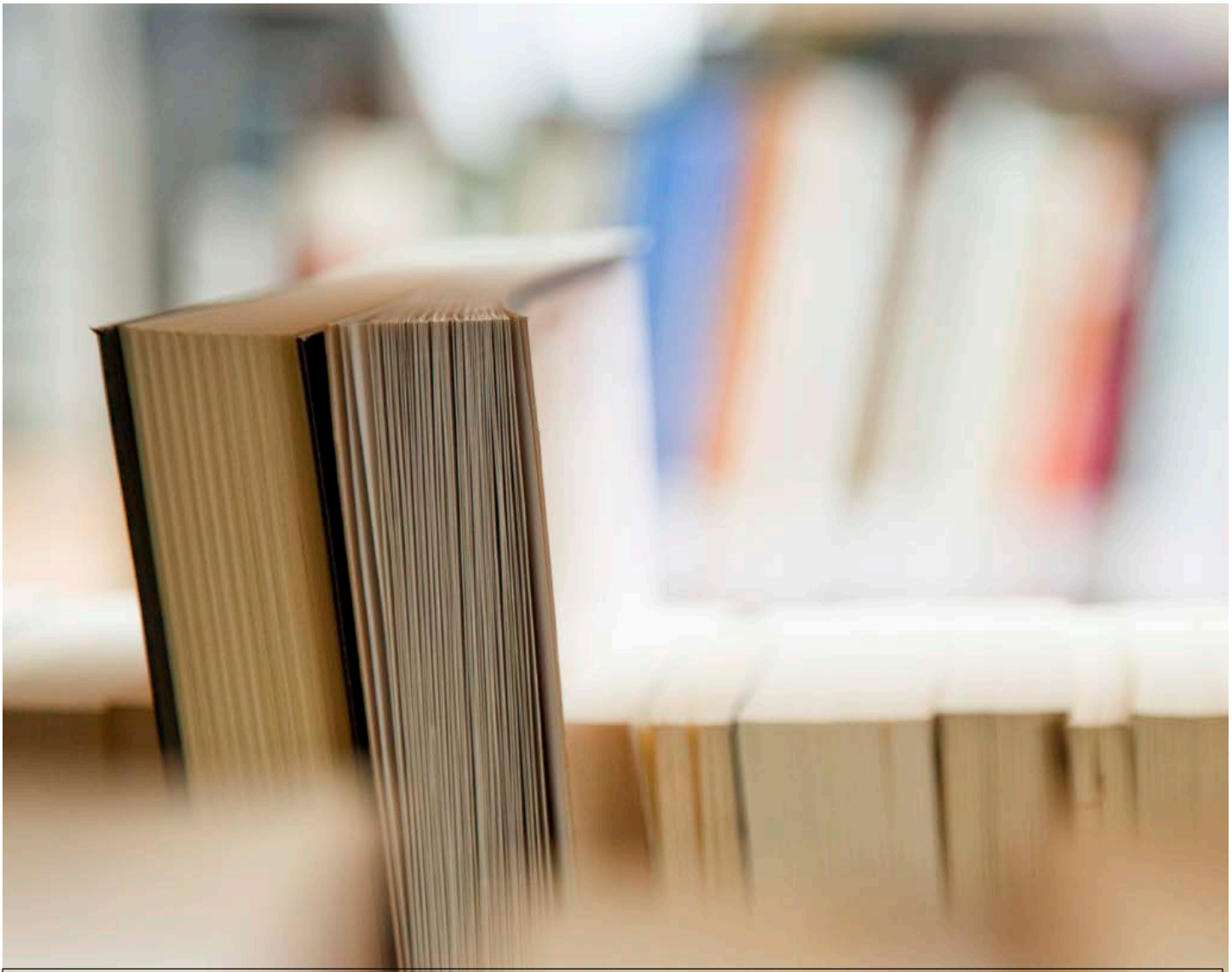
| | | |
|---|---|---|
| **Possible User of CRS** | **=** | **341154*55.61% = 189716** |
| **If 8 million potential then** | **=** | **80,00,000÷73 Units in a Year = 110,000 more users** |

In this scenario an additional 0.10 million units potential for CRS exists with new user base increasing. This number potential will be further broken up into number of years, then further by region, district and VDC based on their contribution to national sales.

**How to factor the distribution capacity of CRS to size the demand?**

That is a very significant question that you have asked. From the very face of it there are few possibilities as discussed with the CRS team during our handholding training part. The demand forecast based on the above scenario and data gives an indicative feel of what we have to achieve.

1. CRS reached 14 million units over a very long period – the next possibility of 8 million is also a daunting task. However this market will also get addressed by competition and if we keep our share intact then we are looking at nearly 4 million units additional
2. This 4 million can be achieved in the next 5 years if we can plan incremental growth based on both the above scenario – addressing frequency ( segment consumer and share targets accordingly ) and addressing new consumers ( segment hard to reach and then targets accordingly)
3. The combined scope has to be shared both by the sales team and the marketing team. Each outlet where we place our product we need to be sure we are trying to address the frequency part or we are getting a new consumer.
4. Finally decide on what proportion of the 4 million would be addressable in the current year and then the targets rationally split among the team.



*This is an easy to read manual for the Sales Team at CRS. The manual presents a simple way to analyze inventory data at various levels of the organization.*

# Analysis of Inventory

## CRS Inventory Subjected to Mathematical Analysis

Benjamin Mathew

4/30/14

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# Background

CRS started in 1978 as the Nepal Contraceptive Retail Sales Project, a joint collaboration between the Government of Nepal, USAID, and Westinghouse America. In 1983, this project was converted into a non-profit company called Nepal Contraceptive Retail Sales Company Pvt. Ltd. CRS has grown steadily since 1978 and contributes more significantly each year to national family planning and public health efforts.

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## CRS Direction

The vision of CRS is to build a healthy future for the people of the Nepal, operating as an efficiently run social marketing enterprise implementing marketing and communication programs in collaboration with the Government of Nepal, international non-governmental organizations, national non-governmental organizations, and donors. The CRS Mission is to enable the poor and underprivileged to build a healthier future for themselves by making family planning, HIV/STI prevention, and maternal and child health products and services more accessible and conducting behavior change communication programs to create awareness and increased use of these products and services.

## Need for the Manual

One of the prime objectives of GGMS project is the help CRS to strengthen is management system so as to enable it to sustain its operation independently. In 2011, an assessment was made by CRS to identify the gaps in the existing management system. Management of commodity distribution system was identified as one of the areas that needed strengthening.

In 2012, FHI360/GGMS contracted MART India to assess the CRS's commodity distribution management system with specific focus on reaching to population who live in interior hills and mountains where distribution of commodity poses extra challenges.

Findings of the assessments showed some areas needing modifications to make the entire supply chain more efficient and effective. Based on preliminary CRS prepared an action plan to address the recommendations of MART and felt it needed

technical assistance to carry out some of the planned activities and consequently requested FHI360/GGMS to provide required technical assistance.

## Present Distribution Structure

CRS for its distribution of products uses both the conventional and the non-conventional distribution network. By virtue of focusing under the banner of health umbrella the network created to distribute such products inclined towards the traditional system of chemist outlets. During the course of its establishment the system has born fruits for the following reasons

1. Acceptability and adaptability of health product generally were higher in the chemist channel
2. Family planning, contraception etc. were the exclusive domain of the chemist and druggist network.
3. Limitation by way legal angle of drug licenses and control prohibited others from dispensing the products.
4. The traditional channel maintained a quasi – doctor cum support in times of health problems

Reaching out to the hinterland required CRS to try innovative and unconventional methods of distribution along with behavior change communication. To achieve these twin roles, CRS associated with community based groups and NGOs – who successfully abetted the CRS aim of bringing about behavior changes in rural communities as well as increase the total market pie.

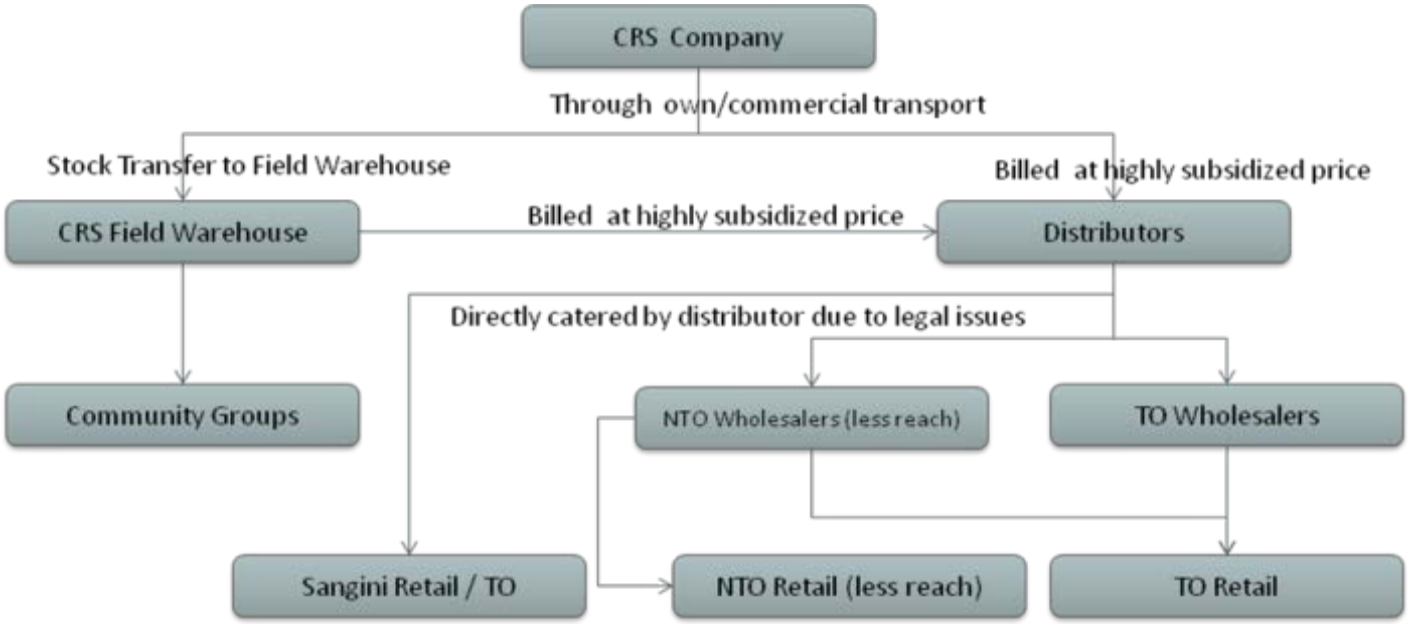


Diagram 1: CRS Distribution Network

### Coverage Map

As per CRS records and claim it has its reach to 7,200 of the traditional (Chemist) outlets and about 10,000 nontraditional outlets. The field officer visits the wholesaler and picks up orders which are then given to the distributor- the distributor then supplies the material to the wholesaler- the wholesaler then distributes the products to the retailer more in the traditional and very few in the nontraditional outlets. In few cases there is a direct selling from the distributor to the traditional retailer. The channel right from the distributor onwards is dominated by the traditional network and almost 90% of the all CRS business originates from this part of the channel. The non-traditional channel has been contributing to only 10% of the total sales of CRS.

## Distribution Structure – Movement of Goods

The raw material is sourced from USAID, free of cost in a lump-sum quantity. This raw material is stored in the central warehouse in Kathmandu. Workers constantly pack the condoms and other products, which are then called as 'packaged goods'. These packaged goods are then forwarded to the regional warehouses for further distribution.

The TO wholesalers are normally located in same towns or nearby towns. These wholesalers cater to local medical and non-medical retail in the same as well as nearby towns. Beyond the town level there seems to be an effort to cover through community groups directly by the field offices. The movement of products is depicted in the diagram drawn above. CRS has 19 distributors mainly located in towns with municipalities. Each Distributor has on an average 30 – 40 wholesaler. The direct coverage of the distributor is limited to catering the wholesale channel, other than this the distributor covers the Sangini Network of Outlets. The distributor does not have manpower dedicated for a regular coverage of the wholesaler or the retail network including the fact that there seems to be no formal permanent journey plan on day wise basis.

Since the Non-traditional outlets have been brought under coverage recently, the efforts to replenish them on a regular basis seems limited. As things stand, the current set of the traditional distributors or the traditional wholesalers do not carry the strength and relationship to cater to the non-traditional outlets. Therefore we see a very limited coverage in the Non-traditional network.

# Introduction Inventory Analysis

The manual will be used by the sales team to understand their entire supply chain, starting from CRS warehouse in Kathmandu to the retail level. The direct beneficiaries of this manual are the Sales Director and his immediate subordinate. It is hoped that this manual will be well absorbed by the direct beneficiaries and passed on to the relevant CRS staff in the CRS sales team.

After reading this manual, you will be able to:

1. Collate relevant data in a well understandable format
2. Calculate various formulas on an excel sheets
3. Map trends based on the raw data available
4. Conduct thorough analysis of each product's supply chains

## Data, Information and Knowledge (DIK) Model

We are often overwhelmed by the amount of data an organization generates at every level. Be it monthly data on purchases by distributors or number of units sold during a season. There is humongous data available within an organization. In these days of advanced data analytics, this is a goldmine for an organization's success. The only challenge is – how to make use of this data for the betterment of my organization? The process is not easy and most of the companies in world are grappling with the same question. The solution is not easy either and varies with the need of every organization.

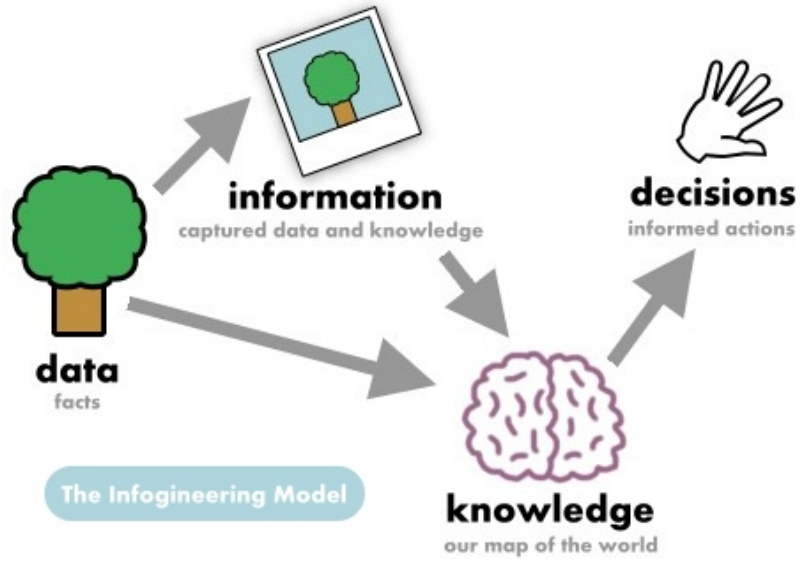


Figure 1.1: The information Engineering Model

The figure (Fig1.1) explains the process of 'data to decisions'. **Data** is defined as being discrete,

objective facts or observations, which are unorganized and unprocessed and therefore have no meaning or value because of lack of context and interpretation[1]. **Information** is differentiated from data in that it is 'useful'. Information is inferred from data[2]. **Knowledge** is typically defined with reference to information. Definitions may refer to information having been processed, organized or structured in some way, or else as being applied or put into action[3]. Data analysis refers to the process from gathering raw data to producing processed information in the form of knowledge. This knowledge then helps us in taking informed decisions. Following sections describe DIK with respect to inventory analysis at CRS.

## Inventory Analysis

Inventory is a very broad term – to come close to inventory analysis there are a few components that we should know before hand and what it means. Let's define some of the essential part of the analysis.

**What is Inventory?**

**Inventory means the good and services of any company or organization which is in its finished usable form lying in any location. The key principle to use here is that the finished good ready to be monetized or revenue accrued should be called inventory. This meaning is what we take forward for the analysis.**

**What is Opening Stock?**

**For any given period, the inventory that is lying at the beginning of the time is called as opening stock. This would also mean that any inventory that is not sold or service unspent would be carried forward to the starting time from the previous period would also constitute as opening stock at the beginning of time.**

**What is Purchase?**

**For any given period, the amount of additional inventory needed to replenish, maintain or address need would be termed as purchases for that period. Purchase also includes the goods in transit but not yet received at the warehouse or location.**

**What is Sales?**

**For any given period, the amount of inventory moved out with an invoice to any entity further would be termed as sales. The sales normally is termed complete when the payment for the inventory moved or billed is received, but there may be chances of credit and lease coming into this transaction thus being termed as sales.**

The first step in implementing effective distribution is efficient inventory analysis and supply chain management. This starts with the very first point where the product (finished/unfinished) is received by CRS. The main objective to achieve via inventory analysis is to reduce the amount of inventory in the product pipeline. The first step in

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[1] Rowley, Jennifer (2007). "The wisdom hierarchy: representations of the DIKW hierarchy". *Journal of Information Science* **33** (2): 163–180. doi:10.1177/0165551506070706

[2] Rowley, Jennifer; Richard Hartley (2006). *Organizing Knowledge: An Introduction to Managing Access to Information*. Ashgate Publishing, Ltd. pp. 5–6. ISBN 978-0-7546-4431-6.

[3] Rowley, Jennifer; Richard Hartley (2006). *Organizing Knowledge: An Introduction to Managing Access to Information*. Ashgate Publishing, Ltd. pp. 5–6. ISBN 978-0-7546-4431-6.

achieving this is to gather the relevant data to analyze inventory. We follow the DIK model as mentioned in the previous section.

## Data to Information

Currently, CRS captures reasonable data pertaining to above description, but the terminology used by CRS is largely the sales oriented. Therefore with this data captured we need a structuring and then to be analyzed and used is what we would be attempting as we go along with this write-up. Currently all data being generated is in a form factor that is directly extracted from ERP source. The effort would be to channelize this data to a structured information and further analysis for decision making at the ground level. To make this information relevant and convert data into information, there is a need to process this raw data. The few processing efforts that we should be doing are:

1. Extracting relevant data from CRS's MIS, logical formats and structures
2. Gathering Arranging data into tabular format in analysis software's such as MS Excel, Lotus 123 etc.
3. Applying appropriate formulas to the data generate desired information

Inventory analysis is required to be done at the following three levels of CRS' supply chain:

1. CRS Central warehouse in Kathmandu – This warehouse receives unfinished products from USAID and other vendors.
2. All six Regional warehouses – There are 6 regions with one warehouse located in each one of them.
3. Distributor Inventory and Sales data – this is proposed to be derivative of the analysis

The next step is to extract monthly data Opening Stock, Closing Stock, Purchases and Sales for a 3 year period. There is an interesting concept for looking at the 3 years period. Let us explain the basic function of a progression. Look at the number below:

## Progression Concept

2, 4, 6, __, 10, 12 could you figure out the blank space… yes its 8. This was possible because we could estimate the next number by looking at the progression. The first there is a difference of 2 between 2 and 4 and then further there is difference of 2 between 4 and 6, therefore likely that the same difference would be there to estimate next number.

Let's look at another progression 1, 3, 6, __, 24 could you figure the blank space yes its 12. This again was simple but figuring was slightly difficult since we knew the difference between the first and second but next could not be guessed. By looking at the next number we estimated backward of the number 12. Suppose if 12 as a number would not have been there, then the possibilities would have been two… 1, 3, 6, 12 or 1, 3, 6, 9 as an answer.

> Progression defines that you need a minimum of 3 variables to accurately predict the trend. For each individual variable a minimum of three values or more could tend to give out a better result.

## How to Calculate

The information is extracted to calculate Inventory Days and Inventory Holding Cost. The logic and formulas have been explained below:

### Inventory Days for each month in a year

Inventory Days calculates the number of days the inventory at a warehouse will last for a given month. This also gives a measure an indication to of 'how much' to purchase and 'when' to purchase. The formula to calculate inventory days in a given month is given below:

> Monthly Inventory Days = [Average (Opening Stock, Purchases/received, Closing Stock)/Sales] * No. of days in the a month

*Excel Formula represented as =average (Number 1, Number 2, Number3....)*

The formula for the average and mean are the same but are denoted differently. When you write the formula for the mean of a given set of units, it sums the all the unit in the list to be divided by the frequency, therefore the formula for the mean is written as

> Mean = Sum of Frequency/Number of Frequency

Where when you use the word average the formulae is written on the assumption that the whatever number of units are taken it is divided by the same number of frequency, therefore the formulae is written as

*Excel Formula Representation Average (X1: X10)*

## Why calculate Inventory Days?

Inventory Days is calculated so that the managers are aware of the stock available at their warehouses and distributor level and how many days will this stock last for. The second element for the calculation of inventory days knows the length of the inventory pipeline. The inference is that the longer the pipeline the more inventories are held at different levels. Longer inventory increases the cost of holding the inventory.

### Inventory Holding Cost

Inventory Holding Cost has minimum two components – Cost of Capital and Rent. More components like electricity & water bills, manpower human resources costs etc. can also be included. But for the sake of simplicity, the manual considers only we have limited ourselves to the two components right now. CRS can decide to add more cost components. The decision of adding more components lies with the sales team. Before we set on to understand, a concept need to be understood.

**Concept of**

# Notional Cost

The process of calculating Inventory Holding Cost goes through a series of efforts steps as listed below.

**Notional costs/Imputed costs/Implicit costs are 'invisible' costs that are not incurred directly. These costs have no actual existence (are imaginary) and you will find that they do not reflect anywhere in the financial statements. A good example of this is our calculation of Inventory Holding Cost which is an imaginary cost incurred at the warehouse level. Calculating notional or implicit costs are important to enable the managers to take better decisions. These costs are management tools which help the managers in efficient management and maintain optimal level of costs. Another example is the concept of opportunity cost which is again, not an actual cost, but only an estimate of taking an alternative investment option. Calculating this cost helps managers take a better decision.**

First, it is important to understand the meaning of what is the thing called "Cost of Capital"?

## What is cost of capital?

Capital or liquid money available for spending has two economic understanding built. The first one is that the value of money declines over a period of time. The second one is part taking money involves a cost of using or accessing the money. In other words, it is an interest for taking borrowing a capital. When both economic parameters are definitive then any capital invested in any form would entail a cost which is called the cost of capital.

Example: X person had got a decided to purchase 100 pieces of mobile phones priced at NPR 1000/piece for the month of April 2014. When X wanted to pay the supplier of mobile phone, he found that he did not have money to pay the supplier so. X went to the Y bank to take a loan of NPR 1,00,000 in the month of April. The bank put the condition that said that it will lend the money to X only on the condition that X need to returns Capital (1,00,000 NPR) plus 1.5% on the capital for one month in the month of within May 2014.

| | | |
|---|---|---|
| Capital Taken from Bank | = | NPR 1,00,000 |
| Interest asked by the bank | = | 1.5% per month (18% p.a) |
| Cost of Capital | = | 1,00,000 X 18 X 1 |
| | = | 18000 NPR annually |
| Monthly Cost of Capital | = | 18000/12 = 1500 NPR |

So if X is going to return to bank what he has borrowed, then

Returnable Value = 1,00,000 + 1500 = 1,01,500 NPR

Therefor the above value or the Cost of Capital, lets mark it as (X)

Calculate average inventory in a year.

> Average Inventory = Sum of Opening Stock /12

1. Multiply the average inventory with yearly sales revenue/unit.
2. Calculate Cost of Capital @ 10% per annum.

> Value of Average Inventory = Average Inventory * Sales revenue/unit for the Product

3. Value of avg. inventory * 0.1
4. Divide the Cost of Capital by Sales.

Apportioning per unit revenue to average inventory would give the value of the inventory held.

But we mentioned above that X = Cost of Capital value

If we spread the cost of capital over the average inventory then we come to know how much each will take the cost of capital. Thus the above X has a new addition

X = Cost of Capital value/Average Inventory

## Why Calculate Rent?

Rent is basically the cost incurred for using a space. Simply called rented out or rent to be paid for using somebody's space. However there are two cases to consider situations to the rent. In the first case, when the space is used and the rent is paid it is very evident as it is paid out as expense. In the second case, where the space is owned by user the rent become a hidden cost not visible, therefore it needs to be calculated.

Let call Rent (Y)...then there is a step by step process to arrive at rent calculation

1. Calculate volume contribution of each product.

> Volume Contribution = Sales of products (units)/Total sales (units)

2. Apportion rent of warehouses to the volume contribution

> Y = Volume Contribution * Total Rent

> Finally Inventory Holding Cost = X+Y

## Why calculate Inventory Holding Cost?

This formula tells us the cost of inventory lying in a warehouse. A warehouse incurs monthly costs of rent, electricity, manpower human resources etc. So, these costs are apportioned to the inventory lying in a warehouse. However, this the inventory holding cost is notional and used by managers to optimize the inventory at a specific warehouse.

## Increasing inventory in my warehouse decreases the apportioned cost of rent per product. So do I increase the inventory in my warehouse?

No, Inventory Holding Cost is a management tool which provides only a notional idea of the cost incurred if a specific amount of inventory is lying in a warehouse. There will be an optimum level of inventory for each warehouse, which has to be determined by the warehouse manager. The objective is not to increase/decrease the Inventory Holding Cost, but to optimize it.

# Knowledge to Decisions

The next step to trend analysis is using these trends to come up with a set of decisions by management. Action plan for implementing decisions will then be made. Figure1.2 illustrates the Inventory Analysis process.

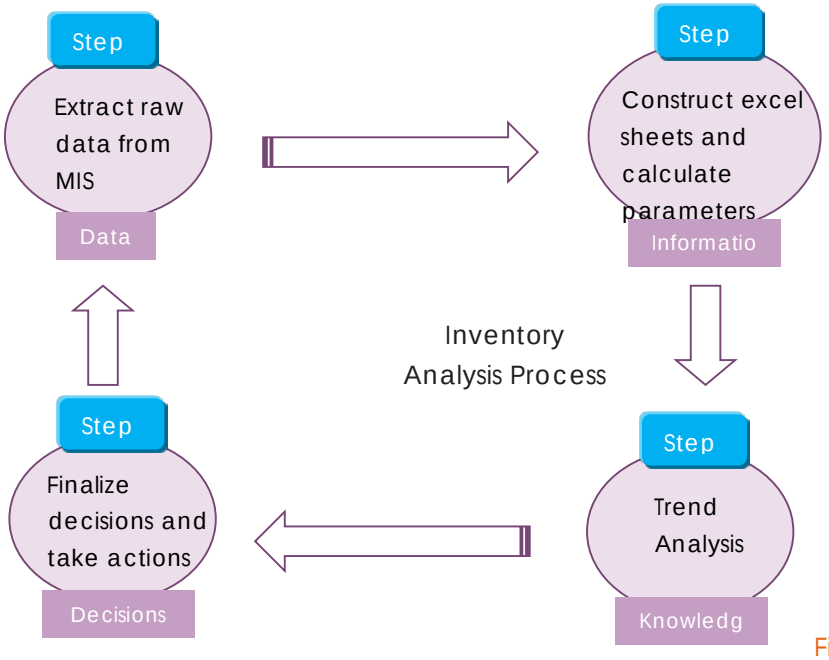



Fig 1.2: Inventory Analysis Process

Just to remind the one logic we talked earlier, to minimize the anomalies and normalize the data, it is preferred to have 3 years data. We can start with one year data but the team noticed the discrepancies in the trends and analysis. Based on feedback we took 2 years data and still the problems persisted in terms of analysis and direction, thereby finally we started to work on 3 years data a serious trend and scope of inventory emerged.

## Step 1: Data

- Extracting Opening Stock, Closing Stock, Sales and Purchases for a 3 year period for Dhaal and constructing basic excel sheets.

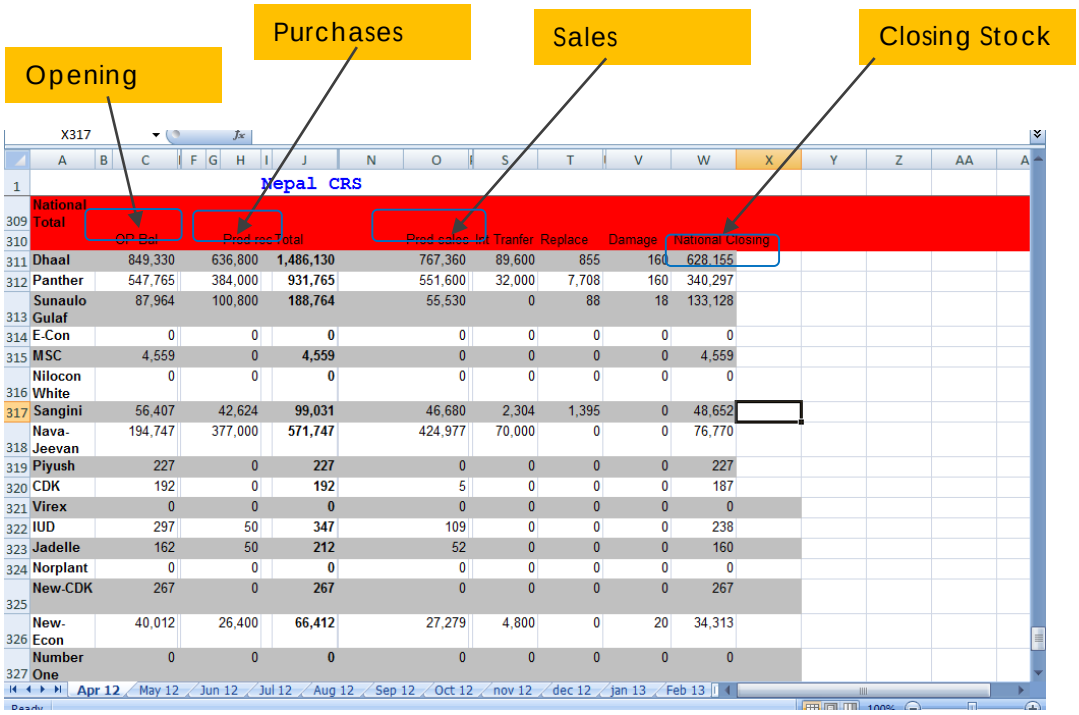
**Central (Kathmandu) warehouse data: Dhaal for FY 2012-13**

A159 | Feb

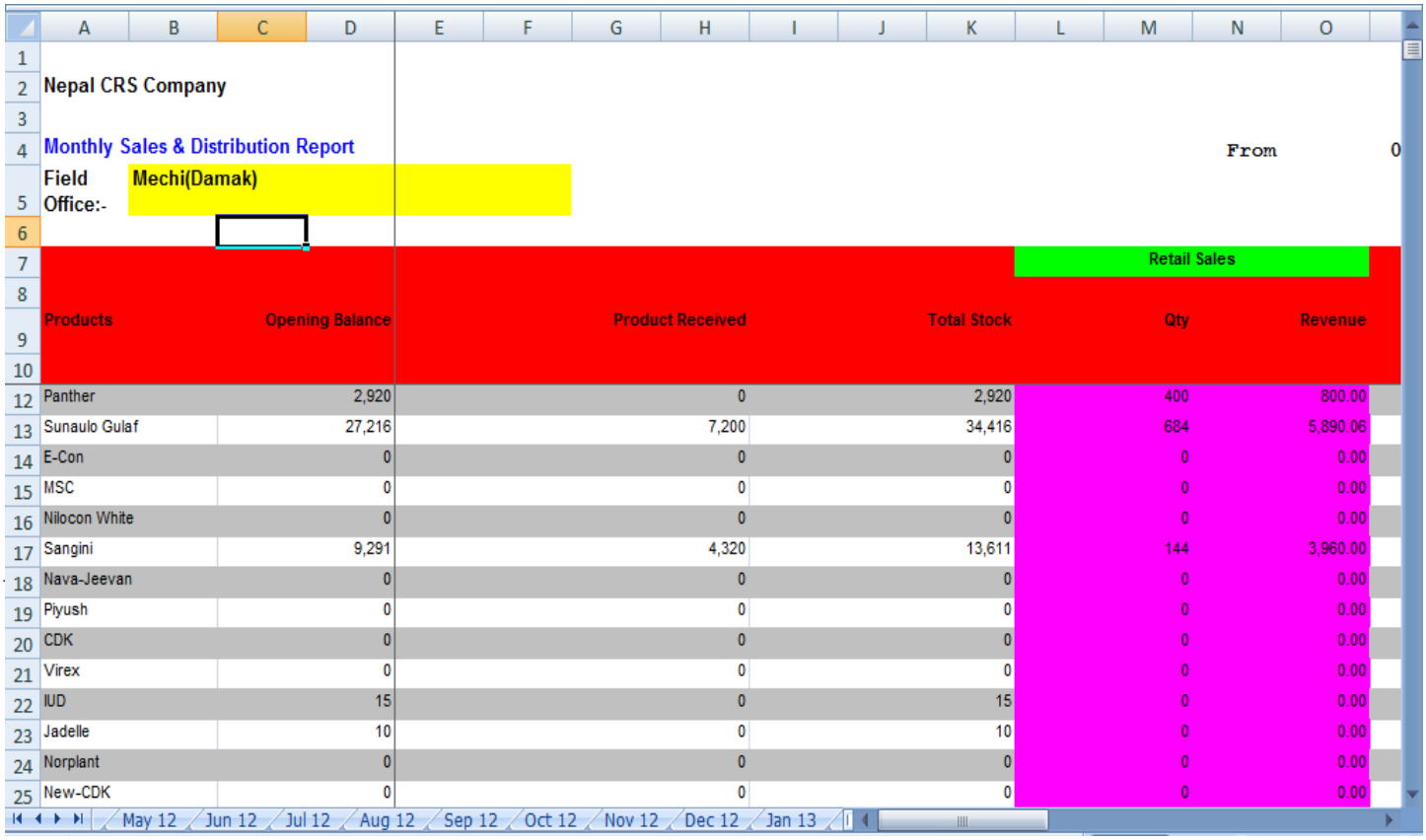
| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | CONDOM (DHAAL/Blue/Gold) | | | | | | 1/4/2014 | | |
| 2 | | | | | | | | | | | | |
| 3 | English month | Nepali month | Previous stock | USAID received | Other received | Expiry replaced | Sample | Losses & Adjustments | Actual Sales | Balance on hand | # of Months supply | |
| 4 | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | |
| 156 | Nov | Kartik | 8,948,305 | | | 24,280 | 240 | 370 | 735,600 | 8,187,815 | 13 | |
| 157 | Dec | Margh | 8,187,815 | | | 800 | 160 | 240 | 501,200 | 7,685,415 | 12 | |
| 158 | Jan'12 | Paush | 7,685,415 | | | 1,040 | 680 | | 512,960 | 7,170,735 | 11 | |
| 159 | Feb | Magh | 7,170,735 | | | 16,000 | | | 584,640 | 6,570,095 | 10 | |
| 160 | Mar | Falgun | 6,570,095 | | | 36,965 | 240 | | 737,760 | 5,795,130 | 9 | |
| 161 | Apr | Chaitra | 5,795,130 | | | 855 | 1,160 | | 767,360 | 5,025,755 | 8 | |
| 162 | May | Baishak 69 | 5,025,755 | | | 55 | 80 | | 495,280 | 4,530,340 | 7 | |
| 163 | Jun | Jestha | 4,530,340 | | | | 14,040 | | 781,200 | 3,735,100 | 6 | |
| 164 | Jul | Ashadh | 3,735,100 | 4,866,000 | | 210 | 13,600 | 200 | 794,240 | 7,792,850 | 12 | Received fr |
| 165 | | | | | | 125,335 | 30,470 | 2,330 | 7,838,240 | | | |
| 166 | Aug'12 | Shrawan 69 | 7,792,850 | | | 5,145 | | 400 | 682,160 | 7,105,145 | 28 | 511,44 |
| 167 | Sep | Bhadra | 7,105,145 | | | 45,200 | 9,080 | | 536,160 | 6,514,705 | 25 | 255,72 |
| 168 | Oct | Ashwin | 6,514,705 | | | 12,480 | | | 441,040 | 6,061,185 | 24 | |
| 169 | Nov | Kartik | 6,061,185 | | | 5,040 | | 200 | 612,400 | 5,443,545 | 21 | |
| 170 | Dec | Margh | 5,443,545 | 3,000,000 | | 10,880 | 80 | 520 | 722,880 | 7,709,185 | 30 | |
| 171 | Jan'13 | Paush | 7,709,185 | | | 159,600 | | 200 | 482,000 | 7,067,385 | 28 | |
| 172 | Feb | Magh | 7,067,385 | | | 1,280 | 240 | | 599,040 | 6,466,825 | 25 | |
| 173 | Mar | Falgun | 6,466,825 | | | | 12,000 | | 760,000 | 5,694,825 | 22 | |
| 174 | Apr | Chaitra | 5,694,825 | | | 3,680 | 80 | | 627,120 | 5,063,945 | 20 | |
| 175 | May | Baishak 70 | 5,063,945 | | | 1,280 | 3,000 | | 998,080 | 4,061,585 | 16 | |
| 176 | Jun | Jestha | 4,061,585 | | | | | | 255,720 | 3,805,865 | 15 | |
| 177 | Jul | Ashadh | 3,805,865 | | | | | | 255,720 | 3,550,145 | 14 | |
| 178 | | | | | | | | | 6,972,320 | | | |
| 179 | Aug'13 | Shrawan 70 | 3,550,145 | | | | | | 416,667 | 3,133,478 | 8 | 5,000,00 |
| 180 | Sep | Bhadra | 3,133,478 | 3,000,000 | RO-3869 | | | | 416,667 | 5,716,812 | 14 | 416,66 |
| 181 | Oct | Ashwin | 5,716,812 | | | | | | 416,667 | 5,300,145 | 13 | |
| 182 | Nov | Kartik | 5,300,145 | | | | | | 416,667 | 4,883,478 | 12 | |
| 183 | Dec | Margh | 4,883,478 | | | | | | 416,667 | 4,466,812 | 11 | |

Dhaal | Panther | Nilocon | Depo | S. Gulaf | ECP | IUDS | Jadelle | Nava Jeevan | Piyush | CDK | Commodity

Ready 70%




This data did not have a national total. Hence, consolidation of monthly data to national total values is done in the example.




## But how do I know how to arrange the data for analysis or simply put tabulating it ?

It is indeed a difficult question to ask, but the answer lies in the possibility of experimentation. What we mean is that as the first step is to collect all the relevant data as shared above. There are couples of basic principles that can be followed to put the data into a certain structure, rest best left to imaginative efforts.

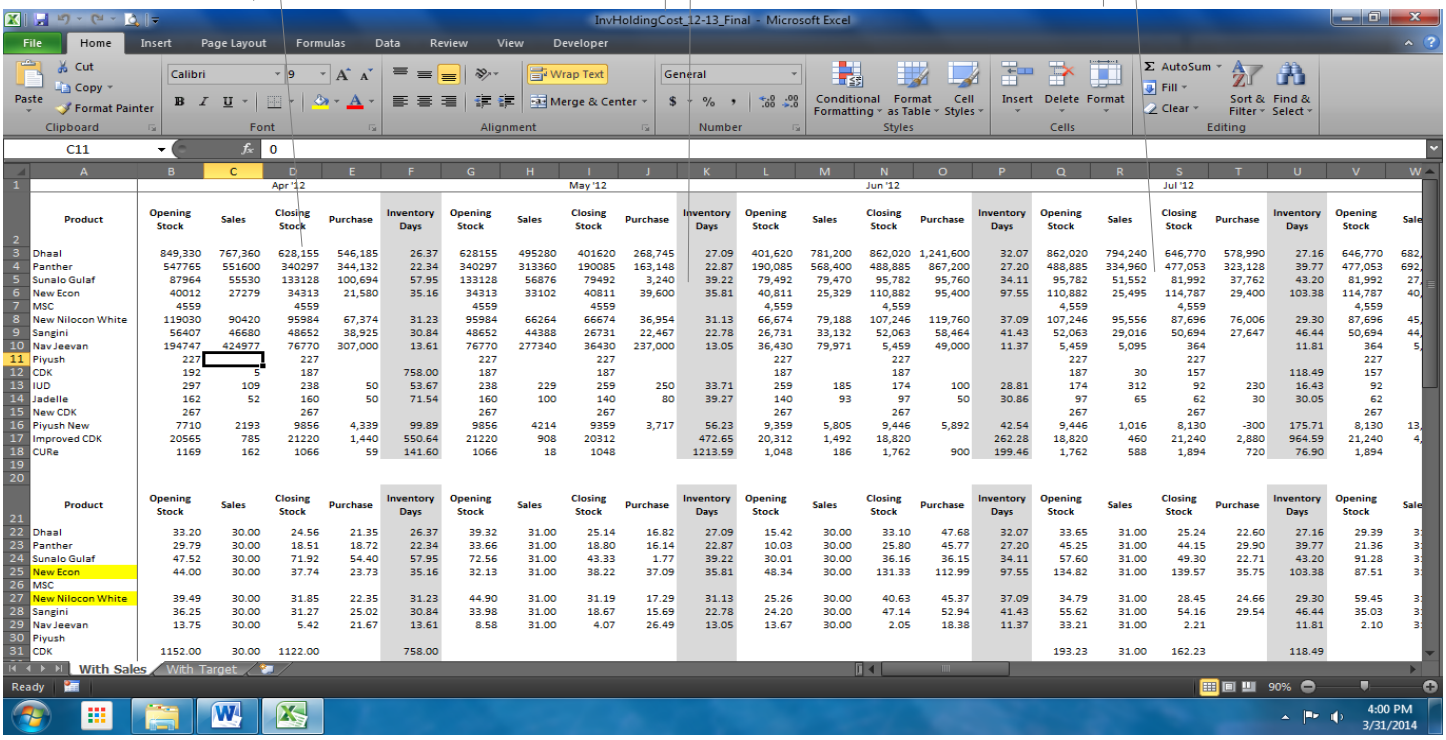
1. If the data contains days months or years it would be best to represent the same as heading in an horizontal manner
2. Any time wise data can also be represented in an horizontal manner under respective months, days or years
3. Product categories, schemes, financial heads all are best laid out a vertically preferably at the beginning of the table.
4. Each individual data set has to be tabulated separately but can be put one below the so as to get a comparative structure.

There is no right and wrong approach to putting the data into a structure, the more you try the better it gets. It is only the practice on the putting the data in excel sheet that would help, keeping some basic level principles to work as given above.

The top horizontal has month's data for the whole one

Heads such as opening, sales and closing stocks have been shown below the month

Inventory days is a formula that calculates holding days based on one month sales




The next step is to further structure the data in tabular format for each product. We suggest a product-wise vertical alignment of all the data. This will make it easier for the managers to comprehend product data and build exclusive product strategies. The same structure can be extended to incorporate the day's inventory at each level as shown below the existing data table. This kind of structure enables a visual comparison on a month on month basis.

# Step 2: Information

- Calculating formulas in excel sheet: Inventory Days, and Inventory Holding Cost

**Inventory days calculation**

=IF(OR(B3=0.C3=0).".".AVERAGE(B3.E3.D3)/C3*30)

F3 =IF(OR(B3=0,C3=0),"",AVERAGE(B3,E3,D3)/C3*30)

| | Apr '12 | | | | | May '12 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product | Opening Stock | Sales | Closing Stock | Purchase | Inventory Days | Opening Stock | Sales | Closing Stock | Purchase | Inventory Days | Opening Stock | Sales | Clo St |
| Dhaal | 4,945,800 | 547,200 | 4,397,600 | | 170.75 | 4397600 | 268800 | 4128720 | | 327.77 | 4128720 | 1,241,600 | 2,8 |
| Panther | 3150800 | 352000 | 2797800 | | 168.99 | 2797800 | 163200 | 5025040 | 2,400,000 | 647.28 | 5025040 | 867,200 | 4,1 |
| Sunalo Gulaf | 768566 | 100800 | 667159 | | 142.43 | 667159 | 3240 | 663882 | | 4245.09 | 663882 | 95,760 | 5 |
| New Econ | 339012 | 21600 | 317412 | | 303.90 | 317412 | 39600 | 277549 | | 155.25 | 277549 | 95,400 | 1 |
| New Nilocon White | 889956 | 67680 | 822276 | | 252.99 | 822276 | 36960 | 785274 | | 449.44 | 785274 | 119,760 | 6 |
| Sangini | 368567 | 40320 | 328247 | | 172.82 | 328247 | 22752 | 305481 | | 287.82 | 305481 | 58,464 | 2 |
| Nav Jeevan | 308220 | 307000 | 65720 | 64,500 | 14.28 | 65720 | 237000 | 22520 | 194,000 | 12.31 | 22520 | 49,000 | |
| IUD | 3280 | 50 | 3230 | | 1302.00 | 3230 | 250 | 2980 | | 256.68 | 2980 | 100 | |
| Jadelle | 1050 | 50 | 1000 | | 410.00 | 1000 | 80 | 920 | | 248.00 | 920 | 50 | |
| Piyush New | 4570 | 4500 | 10070 | 10,000 | 54.76 | 10070 | 3800 | 6269 | | 44.43 | 6269 | 6,100 | |
| Improved CDK | 10368 | 1440 | 8928 | | 134.00 | 8928 | | 8928 | | | 8928 | | |
| CURe | 90 | 60 | 30 | | 20.00 | 30 | | 24 | | | 24 | 900 | |

**Inventory holding cost**

CW 2010-11 | CW 2011-12 | CW 2012-13 | graph 2012-13 | Summary 3 Yrs

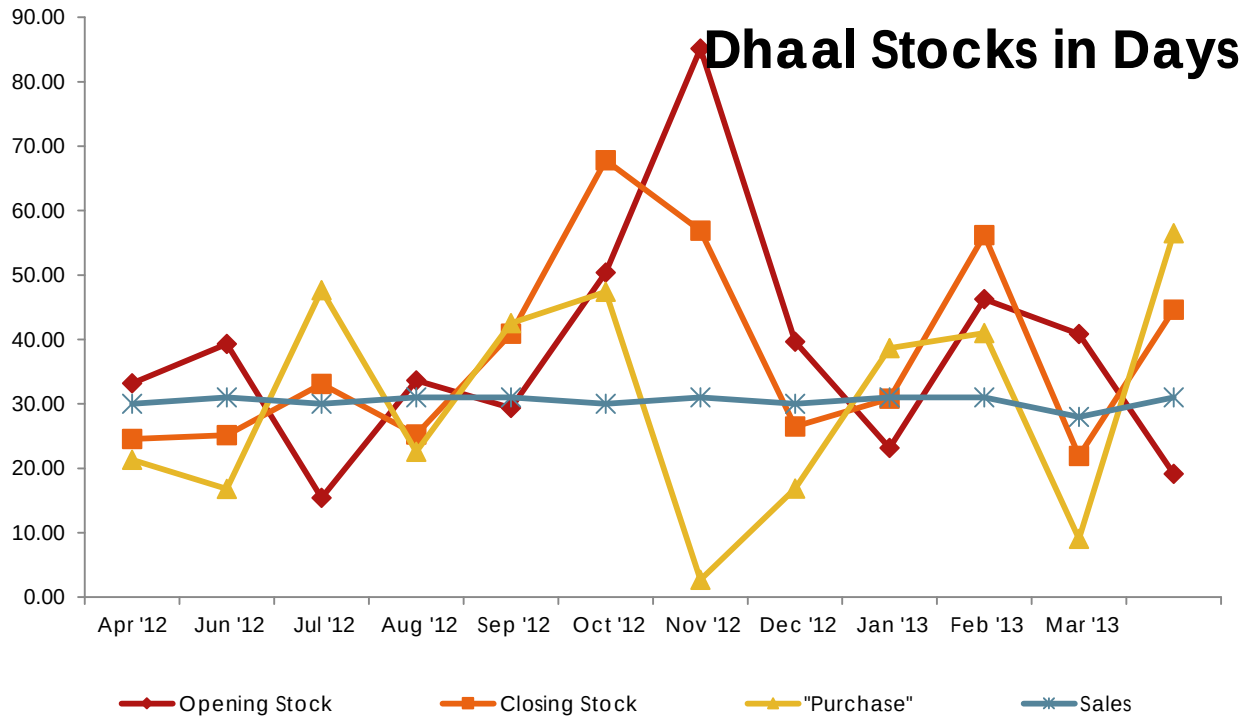
BW24

| | BQ | BR | BS | BT | BU | BV | BW | BX | BY | BZ | CA | CB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Volume Based Inventory Holding cost FY 2012-13 | | | | | | | | | | | |
| Product | Avg Inventory | Unit Cost | Value of Avg Inventory (A) | | Cost of capital of A @10% | Avg Sales | X | | Volume Contribution | Rent Contribution | Y | Inventory Holding Cost (X+Y) |
| Dhaal | 742685.83 | 0.57 | 423330.93 | | 42333.093 | 639480 | 0.07 | | 0.46 | 2760000 | 0.36 | 0.43 |
| Panther | 406102.67 | 3.48 | 1413237.3 | | 141323.73 | 478933.33 | 0.3 | | 0.35 | 2100000 | 0.37 | 0.67 |
| Sunalo Gulaf | 106495.25 | 9 | 958457.25 | | 95845.725 | 48746.667 | 1.97 | | 0.04 | 240000 | 0.41 | 2.38 |
| New Econ | | | | | | 33188.583 | | | 0.02 | 120000 | 0.3 | 0.3 |
| MSC | | | | | | | | | | | | |
| New Nilocon White | | | | | | | | | | | | |
| Sangini | 55469.667 | 26 | 1442211.3 | | 144221.13 | 44316.5 | 3.25 | | 0.03 | 180000 | 0.34 | 3.59 |
| Nav Jeevan | 26147.5 | 6.5 | 169958.75 | | 16995.875 | 66062.25 | 0.26 | | 0.05 | 300000 | 0.38 | 0.64 |
| Piyush | | | | | | | | | | | | |
| CDK | | | | | 0.1 | 13.583333 | 0.01 | | 0.00001 | 60 | 0.37 | 0.38 |
| IUD | 204.16667 | 100 | 20416.667 | | 2041.6667 | 115.16667 | 17.73 | | 0.00008 | 480 | 0.35 | 18.08 |
| Jadelle | 129.75 | 350 | 45412.5 | | 4541.25 | 74.5 | 60.96 | | 0.00005 | 300 | 0.34 | 61.3 |
| New CDK | | | | | | | | | | | | |
| Piyush New | | | | | | 3862 | | | 0.00279 | 16740 | 0.36 | 0.36 |
| Improved CDK | 17014.5 | 36 | 612522 | | 61252.2 | 1610.9167 | 38.02 | | 0.00116 | 6960 | 0.36 | 38.38 |
| CURe | 1517.9167 | 100 | 151791.67 | | 15179.167 | 228 | 66.58 | | 0.00016 | 960 | 0.35 | 66.93 |

| Product | | |
|---|---|---|
| | Total Rent Assumption | 6000000 |

## Step 3: Knowledge

Graphical Representation of single product

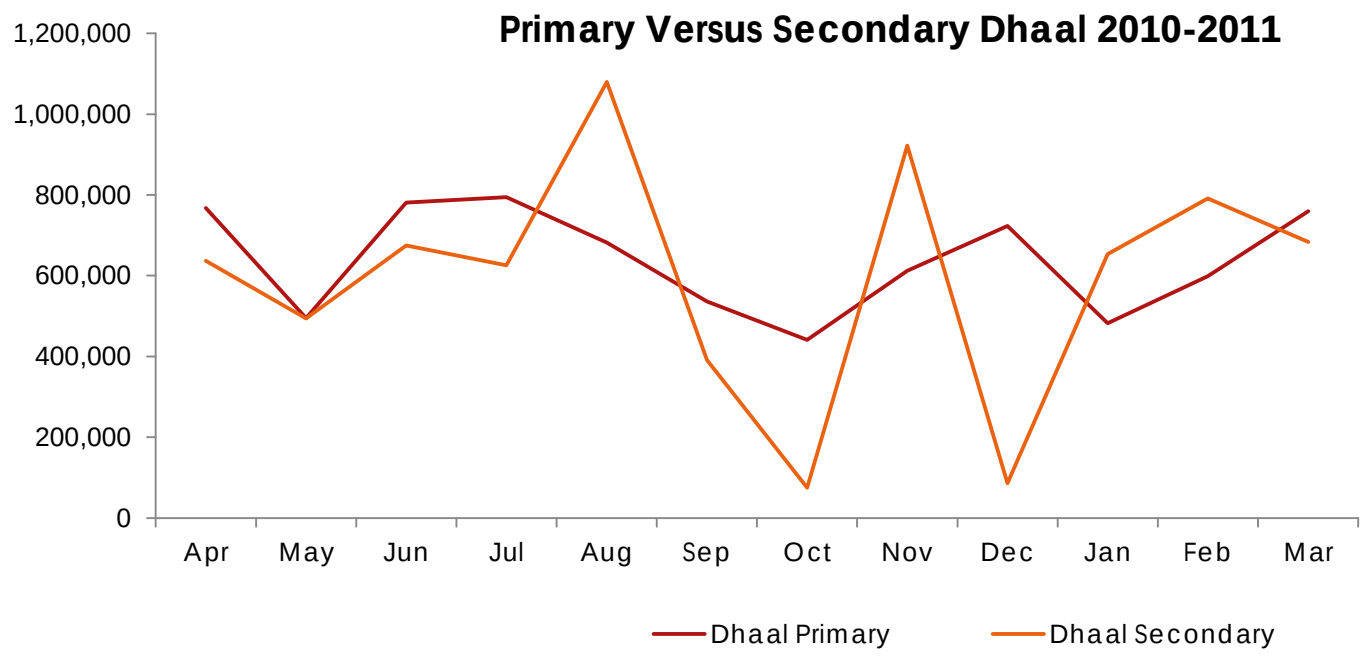



# Creating graphs is very tricky, how do you simply do it?

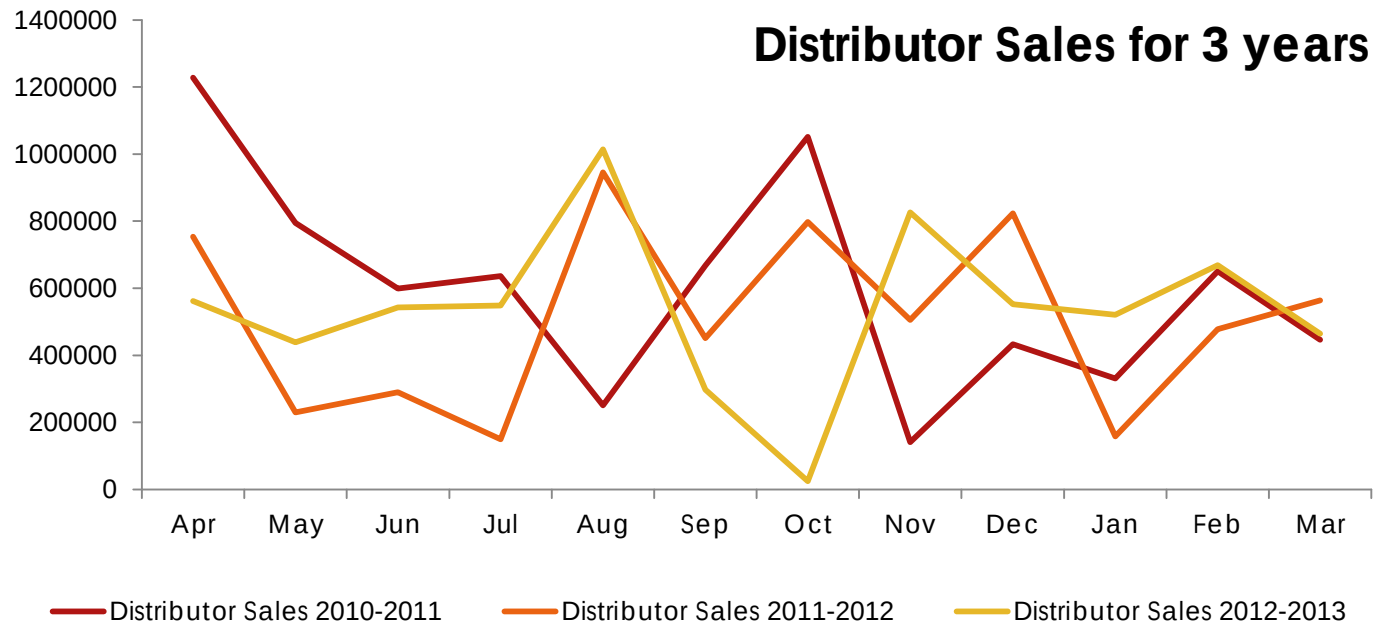
A graph is simply a visual depiction of data to make sense out of it. Partial amount of understanding is created when the data is represented in a robust structure and the next bit of analysis entails when a graphical representation is made of the same data. The combined form gives enough leverage to look and ask pertinent questions on what is happening and why it is happening. To come to an analysis there are 3 steps that need to think of.

1. Experimental on graphical representation formats is the way to learn
2. Re-arranging the data in different ways would enable us to learn and understand data better, leading to asking relevant questions.
3. Finally assessing the qualitative aspect based on the data would give the complete picture of the analysis.

There is no right and wrong approach to putting the data into graphs, the more you try the better it gets. It is only the practice on the putting the data in excel sheet that would help, keeping some basic level principles to work as given above.

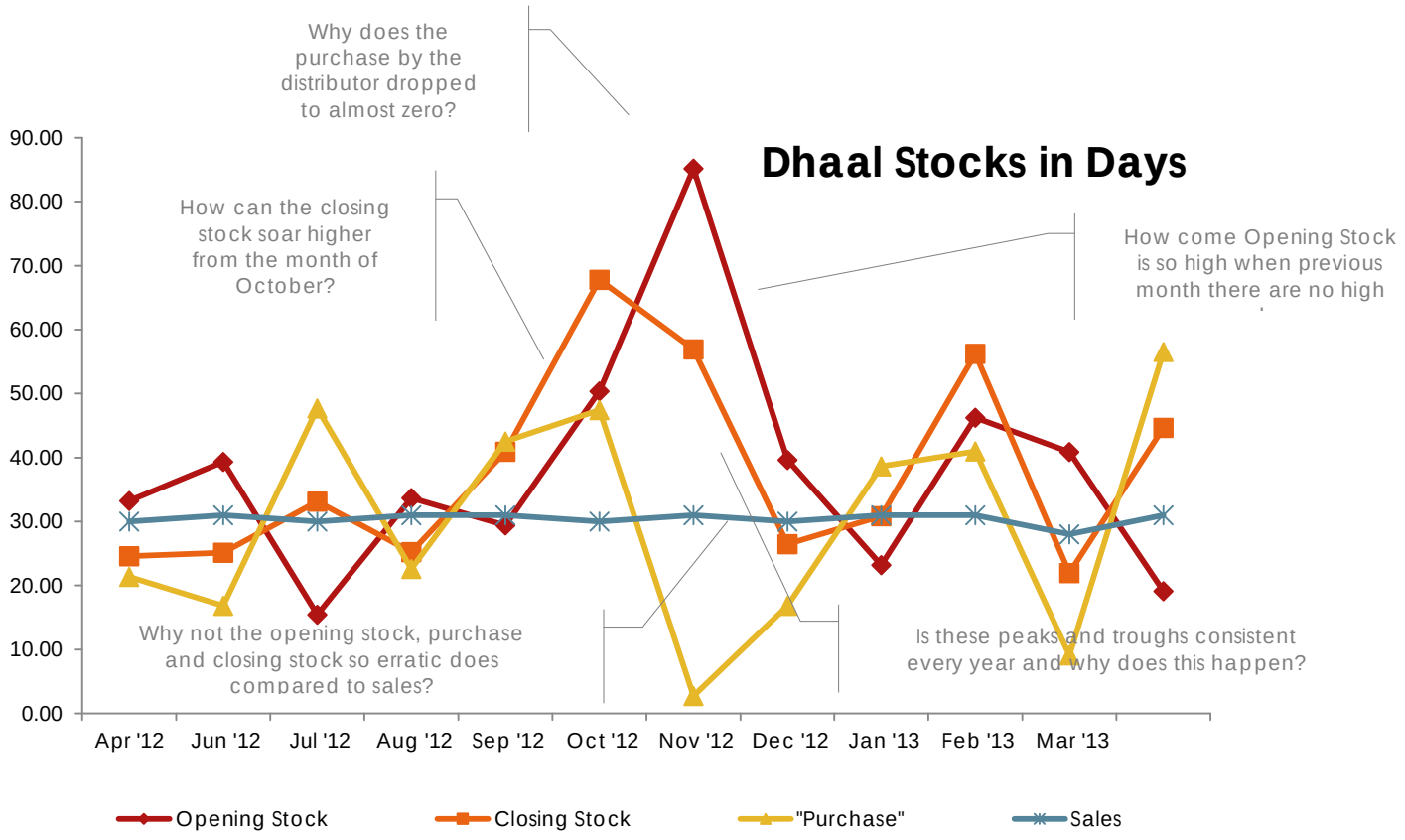



Graphical representation of multiple years for Dhaal



## Step 4: Decisions

Experience of the sales and distribution are key to the levels of decision that can be arrived at or rather better put what key question can be asked while looking at the data. The above analysis both graphical and structure wise should enable the team to really come up some pertinent questions. Some of the questions are:




Some of the variable and discerning questions are asked in the graphical format. A team of marketing and sales when sit together to analyze this data, the answers to the posed questions would be the starting point and its possible answers would become the first steps to the decision making.

Inventory Analysis 2010-2013.xlsx

Inventory Analysis Final.xlsx

# Understanding Margins

## Synopsis of Margin

By margins we tend to quickly relate to the earning of the channel partner in a distribution value chain. This is often in the Asian market context worked out as a percentage on the investment done on the product category the channel at each level. The longer the distribution channel the more margins are shared among the players. In simple terms it is the earnings of the channel handling the product category. The margins can be classified into the following stages in the movement of product from the manufacturer/trading company to the consumer.

### Gross Margin

The amount of margin that is available for whole of the distribution channel including the earnings for the manufacturer is called gross margins. Gross margins are generally built on the principle of:

1. Any cost of manufacture needs to be fully recoverable
2. The cost of manpower, overheads and other fringe cost will be included
3. All promotion, marketing and institutional cost should be recoverable but by apportionment
4. A small portion of profit or surplus need to incorporated to make an income

### Distributor Margin

The amount of earnings available from the gross margins for the first channel is called the distributor margin. This is the revenue earned by the manufacturer including all its costs and the small portion of profit or surplus. Because the price at which the distributor buys is the revenue for the manufacturer, the price at which he/she sells to the next channel is the revenue to the distributor. The next channel usually is the wholesale or retail. The difference in price between the manufacturers selling price and distributors selling price can also be termed as distributor margin.

### Wholesale or Retail Margin

The amount of earning available from the gross margins to the wholesale and retail channel is the called the wholesale or retail margin. These margins may be higher than the distributor margins but it is earned when product is sold to the consumer who ultimately consume it.

## CRS Data

To understand the logic further we need to look at some of the cost and revenue structures of CRS and how it all add up. Please look at the following table for understanding the cost. For understanding sake let us use the business plan projection and cost figures from 2012-13 to 2017-2018. This data was worked on by MART in the per unit cost analysis for distribution project done in 2012. There has been two more business plan later to this and the numbers may vary, however for understanding sake let us use what we have worked on.

The following table represent the value contribution from each product category on a yearly basis. The data used to build this table is both the actual numbers for the year 2013-2014 and subsequent years being the projections. Each products revenue is divided by the total revenue to arrive at the contribution of the product category in value terms to arrive at the contributions. The contribution add to 100% for each year.

This table reflects a very interesting insights on the revenue contribution of CRS product portfolio. We can understand some of the insights, through the following statements given below.

| Value Contribution | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 |
|---|---|---|---|---|---|
| Dhaal | 2.04% | 1.32% | 2.26% | 4.07% | 4.05% |
| Panther | 11.26% | 6.21% | 7.88% | 8.90% | 8.86% |
| Dzire | 18.49% | 17.61% | 21.79% | 21.19% | 21.09% |
| N White | 14.52% | 18.09% | 15.25% | 15.83% | 15.75% |
| Sangini | 7.15% | 6.13% | 8.58% | 7.35% | 7.31% |
| IUD | 0.10% | 0.09% | 0.12% | 0.10% | 0.10% |
| Norplant | 0.10% | 0.10% | 0.13% | 0.11% | 0.11% |
| Sunaulo Gulaf | 2.72% | 3.56% | 3.56% | 4.07% | 4.05% |
| E CON | 14.74% | 19.11% | 15.48% | 15.83% | 15.75% |
| STI | 0.90% | 1.00% | 0.33% | 0.28% | 0.28% |
| Sanitary Napkin | 10.40% | 13.15% | 10.69% | 10.17% | 10.13% |
| Nava Jeevan | 12.52% | 9.10% | 12.87% | 11.20% | 11.61% |
| CURe | 3.95% | 3.55% | 0.59% | 0.51% | 0.51% |
| Piyush | 1.10% | 0.98% | 0.46% | 0.40% | 0.39% |
| **Total %** | **100.00%** | **100.00%** | **100.00%** | **100.00%** | **100.00%** |

1. Dzire contributes or will contribute to the maximum revenue year after year from the data that has been received or projected
2. Nilocon White and E-Con roughly contributes to the same share of revenue however we know that E-Con is a growing category and it will contribute more as time passes.
3. Dhaal is the least contributing category if we look at the massive volumes because of being subsidized and further sold at very low revenue.
4. Incidentally Panther contributes to a very decent revenue in the total portfolio, although considering the fact that volumes are higher than but not as high as Dhaal.
5. Sangini is just about 7% of the revenue contribution of the CRS portfolio

Now that we have got a hang of the revenue, can we also similarly look at the each product category's cost? This mean what it would take in investment, manpower, marketing, and institutional costs that each of the product category is apportioned or allocated.

The following table represent the cost contribution from each product category on a yearly basis. The data used to build this table is both the actual numbers for the year 2013-2014 and subsequent years being the projections. All cost has been apportioned to each product – directly allocable and proportionately allocable to arrive at the cost implication of the product category in value terms. The total cost add to 100% for each year.

| Cost Contribution | 2013-2014 | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 |
|---|---|---|---|---|---|
| Dhaal | 12.39% | 9.29% | 13.19% | 13.16% | 13.11% |
| Panther | 11.81% | 7.51% | 7.94% | 7.93% | 7.90% |
| Dzire | 10.46% | 11.50% | 11.85% | 11.83% | 11.78% |
| N White | 10.35% | 14.88% | 10.45% | 10.43% | 10.39% |
| Sangini | 32.32% | 31.98% | 37.27% | 37.21% | 37.05% |
| IUD | 0.09% | 0.09% | 0.10% | 0.10% | 0.10% |
| Norplant | 0.26% | 0.28% | 0.30% | 0.30% | 0.30% |
| Sunaulo Gulaf | 2.14% | 3.23% | 2.69% | 2.69% | 2.68% |
| E CON | 4.97% | 7.43% | 5.01% | 5.01% | 4.98% |
| CURe | 0.33% | 0.42% | 0.11% | 0.11% | 0.11% |
| Sanitary Napkin | | | | | |
| Nava Jeevan | 10.29% | 8.64% | 10.18% | 10.32% | 10.70% |
| CDK | 3.67% | 3.81% | 0.53% | 0.53% | 0.53% |
| Piyush | 0.93% | 0.95% | 0.38% | 0.37% | 0.37% |
| **Total %** | **100.00%** | **100.00%** | **100.00%** | **100.00%** | **100.00%** |

This table reflects a very interesting insights on the cost structures of CRS product portfolio. We can understand some of the insights, through the following statements given below.

1. Dzire takes around 10% - 11% of the total expenditure year after year from the data that has been received or projected.
2. Similary Nilocon White and E-Con has a diametrically opposite cost – Econ rough accounts for half the cost compared to Nilocon White. With growth in Econ still further reduce costs as volumes goes up.
3. Dhaal is taking more cost to sustain than Nilcon or DZire considering that the category has massive volumes.
4. Incidentally Panther is also not very far behind in cost sustains almost at same level as Dhaal, although considering the fact that volumes are higher than but not as high as Dhaal.
5. Sangini take the maximum cost almost 1/3rd of CRS spending to sustain this category. This is considering a lot of planned expenditure needed to sustain it in the CRS portfolio.

## Comparative Analysis

We have seen both sides of the financials and it would be good now to conduct a very small analysis to make way for some recommendations and thinking. The following table looks at the analysis as a direction, any further interpretation is possible by the team of CRS. The analysis showcases the guide to do it. It is recommended to conduct this process within the sales and marketing team to understand and deliberate. Few comparatives are given below:

| **Revenue** | **Cost** | ***Implication*** |
|---|---|---|
| Dzire contributes to about 18% of revenue year after year | Dzire takes around 10% - 11% of the total expenditure year after. | *This product has all the possible cost covered and is generating a surplus, which mean its gross margin is positive,* |
| Nilocon White and E-Con roughly contributes to the same share of revenue of around 15% | Cost allocation Nilocon is twice the cost of E-Con | *The is small gap of positive margin for Nilocon compared to a more positive gap for Econ* |
| Dhaal is the least contributing category with around 2%-4% of revenue | In the cost part Dhaal takes a massive 12%-13% of the total spending | *Dhaal has a negative margin. The costs weight above revenue by a sizable amount. The more we sell Dhaal the more is needed to sustain it* |
| Panther contributes between 7%-11% of the revenue | The cost Panther bears is also in the range 7%-11%. | *Panther neither has a positive margin nor a negative one. It is break-even point* |
| Sangini is just about 7% of the revenue contribution of the CRS portfolio | From the cost perspective Sangini take close to 30%-37% of the total spending of CRS | *This is completely negative margin product, a heavy dose of subsidy is needed to sustain it.* |

With a small level of analysis we can fairly understand which categories the gross margins are positive and which are kind of subsidized. For instance in the case of Dhaal, since the difference between revenue and cost are negative, two major understanding we get.

1. Partially cost is on account that we are subsidizing the product to bring it access to consumers
2. And the rest of the cost is shared between the CRS own institutional and manpower cost
3. And the channel margins to take the product to the consumer.

In a sense the channel is drawing some benefit of the cost subsidies that CRS is sharing through the cost funding. That leaves us with a few set of understanding to be thought of as we work on price increase in the future.

# Recommendation

The purpose of the recommendation is bring CRS team in cognizance of certain fact and processes of the pricing, especially to have a deep look at the margins. This immediately might not result in actionable points but would definitely sensitize us in smartly tailoring future price point to reflect the realities of the cost and thereby take step to reduce or recover it.

## Process Recommendation

1. We need to understand the principles of margins using the financial principles – that is the contribution of revenues and costs. Each revenue and cost must be weighed in order to correctly gauge its implication and impact.
2. The pricing mechanism should be a component of the following elements – each need to be calibrated independently whether it's going to supported or self-generated
    a. Institutional Costs
    b. Manpower Costs
    c. Product Procurement Cost
    d. Marketing, Sales and Distribution Cost
    e. Gross Margin / Gross Loss – including channel margins
3. Correct and appropriate allocation of costs to each product from the above cost and its proportions for each product.
4. Build a list of each cost linking it to possibility of being supported or being self-generated – that mean we need to have a clear understanding of what is that we are going to support and what we will cover from the price up
5. Thus margins would the built as a part of the product revenue and cost possibilities – a correct financial base to decide upon the structure and size of the margins

## General Recommendation

Approaching from the market and consumer side, here are a few thoughts that we would keep in mind while deciding on the margins.

1. Nature of the channel and its operations generally dictate the relevance of the margin structure for example medical distribution channel would have higher margin for channel as compared to the FMCG distribution channel
2. Higher frequency of consumption or movement of goods tends to have a lower margin and lower frequency of consumption or movement of goods would have a higher margin.
3. This is true also that longer the inventory lies in the channel, the channel will press for a higher margin or push certain costs to be reimbursed.
4. Shorter the inventory stays in the channel more the possibility of a lower margin.
5. The principle of return on investment plays a very crucial role in support and push of the channel. Faster the product category moves more money the channel make by rotation even on low margin and longer the product category take to move lesser the money channel makes even on higher margins

Thus margin is very hard nut to crack, there are no correct margins but only appropriate ones. The better informed ones will tend to arrive at the appropriate margins.

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