(' Production of Paper from Straw',

'Strew is one of the oldest raw materials for paper making. Using soda process straw can be converted to produce writing, printing and wrapping papers for which there is increasing demand in the Amhara Region. ',

'In 1994 E.C. cultivation of wheat and barley covered about 668,470 hectares of land in the Amhara Region. Production of wheat, barley, rice and oats was about 725,100 tons and estimated yield of straw was about 145,000 tons. Main concentration of wheat and barley production is in the “dega” and upper” woina dega” parts of the Region. Straw is used as animal feed in practically all parts of the Region. However, in the parts of the Region mentioned, there is surplus raw which is usually left on the farm. Part of this straw could be collected and processed to produce paper. ',

'Total import of paper in 2004 was about 155,000 tons and domestic production was 8,400 tons. Of this quantity, the share of the Amhara Region was about 49,000 tons. The Amhara Region obtains its paper requirement either from imports or from other parts of the country. Production of paper from straw will partially meet the paper demand of the Region. ',

'The principle raw material is straw and this will be collected from wheat, barley and rice growing localities of the Region. Chemicals which will be used to convert straw to pulp and paper will be imported. ',

'Two major stages in the process- pulping and paper making. In pulping the following operations take place:- Chopping of the straw, dusting, cooking diluting and screening over a vibrating mesh screen; washing and cleaning bleaching is another major step in the production process followed by stock preparation, paper making end finishing operations. Major plant sand machinery include more than 50 pieces of machines and instrument which are too many to list here. ',

'Saves foreign exchange, saves the financial resource of the Region, utilizes an agricultural residue which otherwise would have been wasted, self- sufficiency (at least partially) in paper, new skills and technology to the Region. ', '11','1'),

('Printing Plant',

'main products of a printing plant are books, journals, news-papers, and all other printed materials with large volume of copies. ',

'There are two small printing plants (one in Gondar and one in Bahir Dar) in the Amhara Region. There might be other mini “printing “plants” in the Region. All the existing plants only produce some newspapers, pamphlets, posters, brochures etc. They do not have the capacity (both in terms of scale or technology) to produce books of very large copies. For example, none of the printing plants can print text books required by the Regions student population. As a result, all text books (for elementary, secondary and preparatory schools) are produced in Addis Ababa. In principle, if the market justifies it, the Region should be self-sufficient in all industrial products.

Thus a printing plant with enough capacity and modern technology should be established in the Region for making the Region self-sufficient in all its printing needs especially in printing text books for the Region’s elementary and secondary students. ',

',Due to the absence of a large and modern printing plant, the printing demand for all kinds of books in the Region are met by the printing industry in Addis Ababa. If we take the case of text books printing, the need of a modern printing will be plant in the Region becomes obvious. In the school year of 2003/04, there were 2.02 million elementary and about 112,000 secondary school students in the Region. If we assume that about 8 text books are distributed for two students, the text book need of the Region is about 9,248,000. If we assume that one book will serve four at least for years, this means that every four year, another 9,248,000 text books will be needed in the Region and this is without considering the increase in student population. ',

'The main materials needed for printing are paper and ink; and these products are mostly imported. ',

'The printing industry is one of those industries where technology is changing fast. Machinery and equipment needed are- heave duty chromatronics cutter modes, graphic camera modes, offset duplicator, numbering machine, laminating machine, losser writer, Xerox blue print copies, stripping full size right table, paper drill, wire sticker, IMS mini computer, etc. ',

' Creates employment, makes the Region self-sufficient in the printing industry, keeps the money spent on printing within the Region- i.e. saves the regions monetary resources. ', '11','1'),

( ' Paper Ruling Plant',

'Ruled papers both in horizontal and squared forms are used extensively through out the country. The purpose of this project idea is to manufacture ruled and squared foolscap papers by using a ruling machine with flexography printing process for use in schools, offices, shops and similar establishments. Ruled and squared papers are produced by ruling both sides of a sheet of paper and cut to a standard size. The product is mostly supplied in a packet containing 240 sheets (1.65 kgs.) ',

'All paper producing factories are located in Addis Ababa. Like so many other industrial products, the Amhara Region receives its paper supplies from Addis Ababa- paying unnecessary transport costs which results in higher prices paid by consumers in the Region. Most of the paper produced in the country is made from imported pulp; and ruling paper is a simple mechanical operations which can be done in any city. In the long run the Amhara Region must find its way to produce its paper consumption either from regional resources and/ or from imported inputs in any Region. In the short run, the Region should rule the paper it uses; and for this it needs to establish a paper ruling plant. ',

'More than 80 percent of the paper used in the Amhara Region is ruled paper. The 2.3 million elementary and secondary students in the Region use ruled paper. On the average, one student consumes about one kg of ruled paper in a year. Consumption by 2.3 million students is about 23000 quintals of ruled paper. Consumption by the general population could not be less than consumption by students. So total annual consumption could be 46000 quintals. This market size will make a paper ruling plant viable. ',

'Plain paper is the raw material. At the country level plain paper is partly imported and partly locally produced. The Amhara Region will import its plain paper needs partly from Addis Ababa and partly from abroad. ',

'The most common process is a reel to sheet printing technique using a flexographic process which allows both sides of the paper to be printed (ruled) at the same time when the paper passes through two ruling heads which are covered with engraved rubber cylinders. The printed paper is then cut at the required lengths. Finally the sheets are packed. ',

'saves financial resources for the Region, strengthens, self-sufficiency, enhances the prospect of producing paper in the Region. , '11','1'),

('Envelops and Other Paper Bags Making Plant',

'Paper envelops and other paper bags are important components of stationary products. They are used for packing, letters, documents and other written materials for sending them to other places. Paper bags are common packaging materials used by many types of businesses ',

'Apart from some type of paper bags such as “khaki” envelops, most envelops are produced in the country by importing the papers. All envelop production takes place in Addis Ababa. Other parts of the country including the Amhara Region get their envelop need from Addis Ababa. This causes the transfer of financial resources from areas outside Addis Ababa to Addis Ababa which could be avoided if the products are made in the Regions. As a self sufficiency measure, the Amhara Region should produce its envelops and other paper bags requirement in the Region. ',

'With a population of 19 million and an economy which contributes about 20 percent of the country’s GDP, one can safely assume about the existence of a sufficient market that will make an envelop and other paper bags making plant a viable venture. ',

'Some types of papers that could be used for making envelops and other paper bags can be obtained from local factories. But for the more quality envelops and other paper bags, papers have to be imported. ',

'The main production process includes the following:- Printing, cutting, creasing, folding, gluing and packing. Main machinery include automatic blank fed envelop making machine fitted with flexographic printing units, drying unit, automatic printing units, drying unit, automatic section feeder, sheet separator, glueing and folding attachments with accessories, die cutting machine, etc. ',

' Self-sufficiency, saving of financial resources of the Region, introduction of new skills and technology. ', '11','1'),

(' Toilet Paper (Rolls and Sheets) Making Plant',

' Toilet papers (in rolls or sheets) are becoming essential or basic consumer products because their use can protect people from illness like eases hernia or hemorage. Toilet papers can be manufactured by converting waste paper such as newspapers or by using straws and other similar raw materials. ',

' The use of toilet papers is not unfortunately, very common. It is only used by a small section of the urban population. There is one main reason for this. Most people cannot afford to buy the kind of toilet papers being produced now. Considering the income level of the majority of the population, the prices of toilet papers are expensive. The papers are unnecessarily of high quality with fancy colors. In rural areas people use stones and leaves to clean their bodies instead of toilet papers. This will cause diseases. If toilet papers of lower quality (no fancy color, no too much softness) and of lower price are produced and introduced to the rural population, this will reduce the risk of being infected by some diseases. To improve the hygienic conditions of the people, the production of cheaper toilet papers should be promoted by the concerned agency of the Region. This project idea is the beginning of this promotion. ',

' Of the 19 million people in the Region, probably about 1.5 million use toilet papers. The rest use waste paper, stones and leaves in place of toilet papers. But all of them should have used toilet papers. For the majority of the people to use toilet papers, the prices must be much lower than they are today. One factor that causes the prices to be higher than what can be affordable by many people is the quality of the toilet papers being produced today. For the purpose they are intended to be used, the toilet papers have unnecessarily high quality. What is needed in the rural areas is a type of toilet paper which is plain in color, probably grey and just a paper that can serve its purpose. The toilet paper can be made from old newspapers, thrown away used papers, outdated book copies, etc. From these “raw materials” and using simple technology, it is possible to produce toilet papers which can be bought and used by the “masses”-to used an old term. The maximum potential consumers for toilet papers of lower prices in the Region could be 17 million. Even if we assume that only 500,000 people will start using toilet papers; this will certainly justify the establishment of a toilet papers making factory. ',

' If the investor wants to produce toilet papers from waste paper, the input will be available in the country. If otherwise, the input will be imported. ',

' Waste paper will be sorted and fed into a global digester. At the same time sodium sulphite, soda ash, etc. are sprinkled over the waste paper. The digester is then completely closed and rotated. Next is the charging of the materials into the blow pocher. Circulation is performed by a proper agitator in the washing drum. Then the material is transferred into the dump chest from which it is moved up into the head box by pump. Water is added for dilution. This is followed by removal of dust, washing and drying, bleaching, washing of the bleaching agent, washing, application of color if necessary, slittering and winding in rolls or cutting into sheets. ',

' improves the health conditions of the people who will use the product, improves community hygiene, introduces new skills and technology. ', '11','1'),

7.6 Exercise Book Making Plants (2)

1. Product Description: - An exercise book is a “book” made from paper sheet layers which are ruled, folded to certain dimensions, stapled and trimmed. It is used for writing. Exercise books are usually produced in different sizes (length, width and number of leaves). The most common exercise books have 24, 32 or 50 leaves. In our country and probably in other countries too, exercise books are used by students. Hence the demand for exercise books depends largely on the number of students a region or a country has at a given period of time.

2. Rationale: - Over 2.3 million students were enrolled from grades 1-10 in the Amhara Region in 2004. There are also students in Grade 11 and 12 as will as in vocational training centers, colleges and universities. If we add these and evening students, the current student population of the Amhara Region could reach around 2.6 million. All these students need exercise books. If we assume that one student uses, on the average, 20 exercise books per school year annual demand for exercise books will be 52 million. If we add other miscellaneous demand for the product, say 5 percent of the student demand, annual regional demand for exercise books will be in the range of 54.6 million. All these exercise books are imported from Addis Ababa or from abroad through Addis Ababa. The technology of producing exercise books is simple. It only requires, assembling ruled paper sheets, cutting them to required dimensions, folding them stapling and trimming. These can be done any where. If this is the case, the Amhara Region should have its exercise books producing plant to be sel-sufficient in the product of this vital product.

3. Market Potential: - The potential market for exercise books is around 55 million in the Amhara Region. This demand volume is more than the production capacity of five or more exercise books producing plants.

4. Raw material: - Wood free writing paper, printing ink, cover sheets, stitching wire are the raw materials needed for making exercise books. Apart from the stitching wire, the other raw materials will be obtained from domestic sources.

5. Process and Technology: - The production process begins by conveying an end-less ribbon of paper via unwinding unit into a printing and ruling machine. The paper is lined (made to have lines) there according to the intended use (mathematics or other subjects). Then the ribbon is cut into sheet layers by means of a rotary cross cutter according to the width of the exercise book. These sheets layers are counted and stacked. In parallel to the sheet layers production the covers are automatically conveyed to the production flow. Then the sheet layers and covers are stapled, folded and pressed. The exercise books so made still have longitudinal size equal to the width of the paper ribbon, minimum 350mm and maximum 720mm. Therefore, they are cut down to their regular size by a cutting unit. The stacking and packing of the finished exercise books. Machinery and equipment required include unwinding unit, printing and ruling machine, rotary cross cutter, counting and collecting unit, stack sheet feeder, wire stitching, folding and spine squaring unit, separation unit, collecting and discharge unit

6. Estimated Investment:- For a plant which can produce 12 million exercise books per year, the estimated investment will be:-

 Buildings 400m2 at Birr 2000/m2 = Birr 800,000

 Machinery ……………………………… = Birr 1,900,000

 Working capital ……………………… = Birr 500,000

Total = Birr 3,200,000

7. Benefits: - Saves foreign exchange and regional financial resources, promotes self-sufficiency in an important industrial product, introduces new sills and technology.

7.7 Carbon Paper Making Plant

1. Product Description: Carbon paper is used to copy two or more copies either by using hard pencil, ball pen or typewriter. It is mainly used in offices where there are financial transactions in one way or another or in places where there are no computers and photocopiers.

2. Rationale: The advent of computers, printers and photocopiers had decreased the demand of carbon papers. However, there are still many types of paper works which require the use of carbon papers. All types of activities which involve the transfer of money and other kinds of property require the use of carbon paper for preparing receipts and other associated documents. In our country, still there are many office works which need carbon paper. And this is especially true at the lower levels of the government structures and in areas outside the national and regional capitals. In the private sector, practically all types of money and property transfers require carbon paper for preparing documents which are instrumental for the transfer. This implies that there is a big demand for carbon papers in the country. This demand will continue to exist until such a time that the whole paperwork business is completely done by computers, printers and photo copiers, and that time is relatively far-off in the context of the Ethiopian economy. Until that “time” arrives, we will use carbon papers. And there is a need to produce carbon papers at home.

3. Market Potential:- Four types of carbon papers constitute the largest share of carbon paper consumption. These are one time carbon, typewriter carbon, pencil carbon and special carbon. All the carbon requirement of the country is met by imports and the annual import volume of this product is much greater than the minimum scale production capacity of a carbon paper making plant-which is about 10 million pieces or 108,000 boxes per year. For one-time carbon paper, a small plant had been established near Addis Ababa in the late 1980’s. This plant had a small portion of the domestic market, but it had some quality problems compared to the imported carbon paper. Currently the product of this local plant is not available widely probably indicating some basic problems due to poor quality. Any attempt to produce carbon paper should pay attention to the quality of the product which depends mainly on the level of production technology, quality of raw material and technical know-how of labor.

4. Source of Raw Material: To be imported.

5. Process & Technology: In general preparation of carbon paper involves the following. These are preparation of paper base ink preparation and application of ink on paper. As a base paper or carrier for satisfactory carbon paper, various types of special carbonizing tissues have been developed such as craft and sulfites tissue. Carbonizing tissues are generally available in weights ranging from 4 to 16 pounds per ream. The ink is applied on the tissue paper by a special machine called carbon paper coater. The machine can apply the ink either on one side or both sides as per design. The carbon papers are rolled on chilled rollers and packed.

List of plant and machinery include mixing machine, ball mill, triple roll mill, storage tanks, automatic coating machine, rewinding machine, paper printing machine for back printing, paper cutting machine packing machine, boiler and chilled water plant

6. Estimated Investment:- For a plant which will produce 400 boxes (400 carbon papers in each box) per day, the estimated investment will be the following:

 Building/Shade 600m2 at Birr 1500/m2 = Birr 900,000

 Plant and Machinery = Birr 600,000

 Working Capital = Birr 500,000

2,000,000

7. Benefits:- Saves foreign exchange and regional financial resources, contributes to self-sufficiency, introduces new skills and technology, possibility of export to other part of the country.

8. Location:- Bahir Dar or any Zonal capital preferred by the investor.

7.8 Corrugated Board and Boxes Making Plant

1. Product Description: Corrugated board consists of board built up by gluing a flat sheet on one or both sides of a corrugated paper or medium. These are made of kraft paper with regular curved folds and greaves. Corrugated boxes are made from corrugated boards. The boxes are used as packaging materials for industrial goods.

2. Rationale: Though the level of industrial development in the Amhara Region is at a very low stage, there are some factories which require corrugated boxes for packaging their products. Some of the industrial products which require corrugated boxes for packaging include printed materials, food products such as biscuits, nails, shoes, yarn, edible oil, etc. The corrugated boxes used to package and other products are brought from other parts of the country. The packaging industry develops with the expansion of other industrial sectors. For the products currently produced and for products to be produced in the future, there is a need to establish a small corrugated board and box plant in the Amhara Region.

3. Source of Raw Material: During the initial period of operation, say five years, the craft paper used for making corrugated board and box will be imported. With the development of the paper industry in the Region, the craft paper will be produced in the Region to supply the corrugated board plant with the necessary “raw material”.

4. Market Potential: Between 2000 and 2004, average annual production of corrugated box was 2,530 tons. The share of the Amhara Region was roughly 632 tons. The technology of producing corrugated board and box is not subject to a high degree of economies of scale. A plant which can produce 400 tons of corrugated board can be a financially viable plant if production costs are kept to the minimum. Hence, even the existing demand for corrugated boxes can justify the establishment of a small corrugated box making factory in the Region.

5. Process and Technology: Corrugated board is made of craft paper or straw with regular curved folds and greaves. It is composed of two structural elements which are (a) the facing or linear board and (b) the fluting structure or corrugated medium. The linear is used for outer side of the board and the medium for the inner. The process of producing corrugated board can be summarized as follows. A kraft liner paper and corrugated medium paper are fed into a corrugated machine. Before the medium paper comes in contact with corrugating rolls, the rolls are heated to produce a surface temperature of 3200-3400F. These rolls will heat the corrugated medium when it comes in contact with the rolls. This heat treatment makes the paper soft and pliable so that uniform flutings are produced. On leaving the corrugating rolls, the corrugating medium comes in contact with glue applicator roll which applies adhesive to tips of flutes formed by the rolls. After the application of the glue, the first liner is brought into contact with the glue tips and then wound in roll. The resulting board is a single face. For making a double face board, adhesive is applied to the flutes on the other side of the corrugating medium and a second liner is applied.

For manufacturing corrugated box from corrugated boards, the process involves cutting the board, creasing, shearing, corner cutting and stitching. Main machinery include corrugating machine, board cutter, pasting machine, sheet press, rotary cutting and creasing machine.

6. Estimated Investment: For a plant which can produce 1 ton of corrugated boxes, estimated investment cost will be as follows:

 Building/Shading 240m2 at Birr 1500/m2 = Birr 360,000

 Plant and machinery = Birr 500,000

 Working Capital = Birr 450,000

1,310,000

7. Benefits: Promotes self-sufficiency in the Region, saves regional financial resources, introduces new skills and technology to the Region, and crates the possibility of using straw to produce material for corrugated board.

8. Location: Bahir Dar, Combolcha, or any city which the investors prefer.

7.9 Screen Printing Making Plants (4)

1. Product Description: Screen printing also called silk-screen printing is used for advertising and commercial printing on a wide range of printing stocks such as textiles, glass, plastics, metals and other non-paper surfaces. It is used for printing posters, window and counter-displays and for a number of industrial items such as radio and instrument dials, electrical circuits, glass bottles, pottery, packages and containers.

2. Rationale: In general the printing industry in the Amhara Region is at a very low stage of development compared to the same industry existing in the other major regions of the country. Within the printing industry, screen printing is almost non-existent in the Region. Major screen printing works required in the Region are prepared in Addis Ababa and then transported to the Region. This crates inconvenience in addition to transport cost. Like other industrial products, the Amhara region should strive to be self-sufficient in the screen printing industry. This project idea is the beginning to promote the establishment of a screen printing industry in the Region.

3. Market Potential: The products of screen printing are not like normal industrial products which are produced and sold in the market. Screen printing is basically a service giving operation. Customers bring their orders or messages to be printed. The printers then prepare the design and the medium material and do the printing work. This is why printing is a service operation. Screen printing is mostly for commercial printing. During the last ten years, commercial activities have greatly increased in the Amhara Region. In big and small urban centers of the Region, many types of business enterprises are opened. All the new enterprises need different types of screen printing to promote/advertise their businesses products and services; and this need will increase with the expansion of business activities. The current and the future need for screen printing in the Region will sustain the viability of a number of small scale screens printing in the Region.

4. Source of Raw Material: Screen printing requires ink and the material to print on. Such materials include textile, glass, plastic, metals, etc. Textile will be obtained from domestic sources, the rest will be imported.

5. Process & Technology: In screen printing process, a stencil representing the non-printing areas is applied to a silk, nylon or stainless-steel fine mesh screen to which ink with consistency of paint is applied and transformed to the surface to be printed by scrapping with rubber squeeze. The stencils are generally made in one of the three ways by cutting out the design on paper film; by photographing the image on sensitized gelatine; and by painting the matter on the screen with an ink and water resistant lacquer. The screen is mounted on a frame which is hinged to base that holds the stock to be printed. The article to be printed is placed beneath the screen and ink is forced by a “squeeze” through the screen either by hand or by machine.

6. Estimated Investment: For a plant which will produce 40,000 impressions of one print/day on plastic the estimated investment is as follows.

 Building/Shade 200m2 at Birr 1500/m2= Birr 300,000

 Machinery = Birr 350,000

 Working Capital = Birr 250,000

900,000

7. Benefits: Promotes self-sufficiency, introduces new skills and technology.

8. Location: Bahir Dar, Debre Birhan, Combolcha, Gondar, Debre Markos.

7.10 Gummed Paper (Other than Stamps) Producing Plant

1. Product Description: A gummed paper tape consists of gum applied on one side of the tape and the other side is some time printed to give a better look. By applying water to the gummed side of paper it can be used for sealing, sticking and pasting purposes. It is mainly used in packing and sealing corrugated and solid fibre board containers, paper boxes, paper cartons and small packages. Printed gummed papers are often used for decoration, stenciling of names ands designs on metal, glass and plastics. It is ideal for it can be positioned in the printing operation and provides clean sharp edges to the printed designs.

2. Rationale: The use of gummed paper is directly related with the size of an economy and its rate of growth. Though the Ethiopian economy is not large by the standards of developed countries, it is an economy that consumes a consider able quantity of gummed paper. All the gummed paper requirement of the country is met by imports. But the product can easily be produced at home with modest investment, and simple and conventional technology. Like many other imported industrial products, it is a mystery why investors have not looked into the opportunity of producing, gummed paper in the country. This project idea is to trigger the interest of potential investors so that they could establish a plant to produce gummed paper.

3. Market potential: About 600 rolls of gummed paper per day is believed to be the minimum plant capacity. This amounts to and annual production capacity of 180,000 rolls. The country’s economy can absorb/utilize this quantity and possibly more.

4. Source of Raw material: The main raw materials are craft paper and adhesives. The Kraft paper can be obtained from domestic sources, while the adhesives will be imported until such a time that they are produced at home.

5. Process & Technology: The process can be divided in to five steps. Breaking of the glue flakes, glue preparation, glue costing, drying of the coated paper and slitting and rewinding.

6. Estimated Investment: For a plant which will produce 600 rolls of gummed paper per day, the estimated investment will be the following

 Building/shade 300 m2 at Br 2000/m2……….. .. 600,000

 Plant and Machinery …………………………… 150,000

 Working capital ………………………………….. 200,000

Total …… 50,0000

7. Benefits: Saves foreign exchange and regional financial resources, promotes self-Sufficiency, and introduces new skills and technology.

8. Location: Combolcha, Debre Birhan

7.11 Printing Ink Making Plant

1. Product Description: The ink used in the printing industry is known as printing ink. It is applied to paper through printing machine in the form of a thin film. The film consists of individual letters, isolated designs and solid areas separated by blank unprinted spaces. Printing ink is essentially an intimate mixture of pigments, oils, varnishes, driers and some other additives. Printing ink must posses suitable physical characteristics such as viscosity, length and flow and it should be possible to adopt it for the particular type of printing press and stock which it is to be used. Printing inks are divided into three main classes which are: Planographic printing ink, typographic printing ink and intaglio printing ink. Plano graphic inks are used to print from plane surfaces as in lithographic and offset processes. These are generally heavier and shorter in characteristic. The pigments and vehicles used in these inks must not be affected by water. Typographic inks are used to print from a raised surface such as ordinary type with line and half one cuts. These inks are very long i.e. they may be drawn out in fairly long threads. Typographic prints are of four types automatic press ink, job press ink, flat bed press ink and sheet fed rotary press ink. Intaglio printing ink are originally called steel or copper plate inks and are used to print from engraved or depressed surfaces. The character of the ink depends upon to kinds of plate, the type of press being used and the speed of operation.

2. Rationale: There are more than two hundred small and large printing plants in the country. Most of these were established during the last 10 years. With the expansion of elementary and secondary education in the country, the printing demand especially the book printing demand has greatly increased. In 2004, there were more than 11 million students in elementary and secondary schools; all these students require books of different subject for their education. This is one important indicator of the expansion of the printing industry. This also shows the increase in demand for printing inks. However despite all this huge market for printing ink, the product is still being imported consuming a substantial amount of foreign exchange every year. The expansion of the printing business has resulted in the establishment of many printing plants.

Another result of this situation should be the establishment of a plant that will produce printing ink for the expanding printing industry.

3. Market potential: As indicated above, for the expanding printing industry the demand for printing ink per year could be measured in the hundreds of tons. The minimum economy of scale for producing printing ink is in the region of 100 kgs. Per day or about 27.5 tons per year. There is a market whose absorption capacity is greater than 27.5 tons per year. Hence, establishing a printing ink making plant will be a viable venture.

4. Raw Material Source:- Raw materials used to manufacture printing ink include different types of inputs which can be generally classified as organic and inorganic pigments, oils resins, driers, solvents and diluents, waxes, and surface active agents. Each group of inputs performs different functions in the making of a given type of printing ink. Almost all the inputs for making printing ink will be imported. However, there is also a high potential for producing some of the ingredient locally.

5. Process and Technology: The process of printing ink manufacturing is simple. First the various ingredients are mixed together as per given formulation and the mass is ground (made into powder). While mixing, initially a semi-viscous paste is prepared by mixing pigment in same amount of vehicle and then in this paste other ingredients are added. This mixing operation is carried out either in paddle mixer or dough mixer. The next step is grinding of paste which is generally done in water cooled three or five roller mills or pebble mill. Since heat is generated during the operation, water cooling is required to remove the heat. When the printing ink material has been ground in paste or semi-paste form, the vehicle or solvent is incorporated for mixing the finished product. For this change can mixer is often used. Finally the product is packed in suitable containers with the help of a felling machine.

Major machinery units required include storage tank for solvent, grinder, mixer, storage tank for ink, miscellaneous such as pipes, pipe fittings, etc and filling and packaging machine

6. Estimated Investment: For a plant which will produce about 100 kg. of printing ink per day, the investment requirement will be the following.

 Building/shade 200 m2 at Br 2000/m 2 = Birr 400,000

 Machinery ………………………… = Birr 500,000

 Working Capital ……………………… = Birr 400,000

Total ….. =Birr 1,300,000

7. Benefits: Promotes self sufficiency in a critically important industrial input, saves foreign exchange, will bring in financial resources to the region through export, introduces new skill and technology,

8. Location: Bahir Dar, Combolcha, Debre Birhan

7.12 Re-Pulped Waste Paper Making Plants (2)

1. Product Description: Repulped paper is suitable for drawing paper, permanent document paper, filter papers and pads, file covers, duplicating papers, tissue papers, etc. The paper has high tensile bursting, tearing and double fold strength as compared to mill made paper and it does not turn to brittle due to aging. Repulped paper has good texture for drawing and writing.

2. Market Potential: Average annual import of paper products between 1985 and 1994 was 10,832 tons or 10.832 million kgs. Average annual foreign exchange expenditure for the paper products was Birr 27.42 million. Domestic Production of paper products between 2000 and 2004 was about 9700 tons per year on the average. Projected demand for paper products was estimated to be 55100 tons for 2006 and 101000 tons for 2015. This shows that there is plenty of space to substitute imports by domestic production.

3. source of Raw material: The main raw materials for repulped waste paper are cotton/hosiery rags, waste paper, agro-fibres (straw, bagasse…) other additives ( caustic soda, bleaching powder). All these raw materials can be obtained from local sources. The fact that these raw materials can be found in the country is an encouraging factor to produce repulped waste paper locally.

4. Process and Technology: The main production processes are preliminary treatment, beating, and sheet formation, pressing, peeling, drying, calendaring and packing. In the pretreatment unit, cotton rags are cut into small bits with power operated rag choppers. In the case of agro-fibers, the material, after chopping, is cooked in a small open digester with low percentage of alkali. Cut and dusted rags are beaten to pulp stock in small power operated Hollander beater with or without bleaching. The material is washed by means of a washer drum followed by further beating. Addition of normal fillers/loadings and dyeing and sitting chemical as required for the end product is also accomplished during beating. Sheet formation is carried out by draining water from a dilute fibre mix through a fine screen and both dry the mat thus formed by dewatering with rollers, drying on heated rolls, and smoothing with calendars. The calendared paper is hand sorted, edges trimmed with the help of power operated cutting machine and packed. Main machinery and equipment needed include open digester, rag chopper, beater, Hollander beater with drum washer and accessories, auto Kats with pair of moulds and stock pump.

5. Estimated Investment: For a plant that will produce 90 tons of repulped waste paper per year, the estimated investment will be:-

 Building/shade 700m2 at Birr 1500/m2 = Birr 1,100,000

 Machinery ………………………………..…= Birr 11,100,000

 Working capital ………….……………….. = Birr 500,000

Total = Birr 12,700,000

6. Benefits: Saves foreign exchange and regional financial resources, brings in financial resources to the Region, and utilizes materials that could have been thrown away, introduces new skills and technology.

7. Location: Bahir Dar, Debre Birahan.

7.13 Sanitary Napkin Making Plants (2)

1. Product Description: Sanitary napkin is a product used by women during their menstrual periods. This sanitary product can be made either from cotton only or from a combination of absorbent paper, water proof paper, crushed pulp and non- woven cloth or rayon paper. Absorbent cotton is found to limit bodily movement considerably and it is not also very comfortable to use. Besides, it is expensive. Sanitary napkin which is made from absorbent paper, water proof paper, crushed pulp, etc. has largely replaced absorbent cotton for handling menstruation. Sanitary napkin is clean; it is easy to carry around; and it is thrown away once used. The need of establishing an absorbent cotton making plant is identified in another project idea. This project idea is to give another project idea for producing a product for the same purpose but to be made from different raw materials.

2. Market Potential: In 2006, there are about 4.6 million women in the Amhara Region who are in the reproductive age group. These women are the potential consumers of sanitary napkins. But up to now only women in the urban areas use sanitary napkins during their menstruation periods. Probably due to lack of awareness, women in the rural areas do not use sanitary napkins. And this creates so much inconvenience and many a time embarrassment for many women. With proper introduction of the product to rural markets and with effective awareness creation about the benefits of sanitary napkins, practically all rural women of reproductive age will want to use the napkins. Of the 4.6 million women of reproductive age group in the region, about 4.1 million live in rural areas. If 30 percent of these women use sanitary napkins, total number of consumers in rural areas will be 1.2 million women, If one woman uses about 4 pieces of sanitary napkins per menstruation cycle, total annual demand for this product will be 57.6 million pieces (1.2 mill. X 4 x 12 months). This estimated demand is for 30 percent of rural women of reproductive age. If we include urban women and if we raise the percentage share of rural women who will use sanitary napkins, the estimated demand for this product will be much higher than indicated above.

3. Source of Raw material: As stated above, the raw materials are absorption paper, water proof paper, crushed pulp and non-woven cloth or rayon paper, adhesive tape. The non-woven cloth can be purchased locally while the rest will be imported. Probably absorption paper and water proof paper could be secured from domestic sources.

4. Process and Technology: The manufacturing process of sanitary napkin will differ depending on the raw materials used, the shape of the finished product, etc. Therefore, there is no fixed method of processing. Main machinery and equipment needed include manufacturing machine, small conveyor, hoist, sealing machine, and other accessories.

5. Estimated Investment: For a plant that will produce 3.6 million pieces of sanitary napkin, the estimated investment will be:-

 Buildings 800m2 at Birr 2000/m2 = Birr 1,600,000

 Machinery ……………………………= Birr 1,700,000

 Working capital ……………………. = Birr 600,000

Total = Birr 3,900,000

6. Benefits: reduces the inconvenience women face during menstruation period, enables women to do physical work without much hindrance, improves the personal hygiene of women, introduces new culture to the rural areas of the region, and introduces new skills and technology.

7. Location: Combolcha

7.14 Straw Pulp and Yellow Board Making Plant

1. Product Description: Yellow board is a kind of paper board which is used for a wide range of purposes including folding boxes, backboard for writing pads. Yellow board is made from rice straw or wheat and barley straw and treated with small amounts of lime milk, soda ash, etc. This product can be turned into white board if bleached pulp is added as a surface layer in the process of manufacturing.

2. Market Potential: All the paper board requirements of the Amhara Region including yellow board are imported from Addis Ababa or abroad. The demand for yellow board depends upon the development of the packaging and printing industries. Though not very many, there are some industries in printing, meat packing, food processing and textile sectors which require the use of yellow boards. The yellow board production; envisaged in this project idea is intended for distribution in the Region as well as in the country. As the raw material for yellow board is available in the Region, it is possible to produce the product for regional and national market.

3. Source of Raw material: The main raw material for yellow board is rice, wheat or barley straw. This material is found in cereals producing localities of the Region.

4. Process and Technology: The manufacture of yellow board has two major stages. The first stage is pulp making and the second is paper or board making. Pulp making involves the pretreatment of straw (cutting and dusting), cooking (putting in a digester, adding lime), stock preparation (feeding the material into a dilution box with a pump, adding fresh water and beating) and chemical preparation (dissolving lime for digestion). The second stage is for the manufacture of paper. This stage involves the feeding of the pulp into a paper machine which consists of wire, press, dryer parts, calendar and paper cutter. Each component has its own distinct operation to manufacture the paper.

5. Estimated Investment:

 Buildings/shade 1500m2 at Birr 1500/m2 = Birr 2,250,000

 Machinery ……………………………………….. = Birr 7,500,000

 Working capital ………….………………….…. = Birr 800,000

Total = Birr 10,550,000

6. Benefits: Saves foreign exchange and regional finance, utilizes local raw material-straw, and introduces new skills and technology.

7. Location: Any urban center around which there is a large cereals growing area.

7.15 Kraft Bag Making Plant

1. Product Description: Multi-wall Kraft bag is a large size multi-ply paper bag made up of more than two sheets of strong Kraft paper (normally 3-4 ply) for the purpose of holding heavy matter over 10kg. The bag is a suitable container for cement, fertilizer, rice, barley, wheat flour, sugar, common salt, palletized resin and other industrial chemicals in powder and grain forms. Kraft bags come in four types to suit the shape of the material to be contained: one end machine-sewn, both ends machine-sewn, one end pasted and both ends pasted. When air tightness is required, a highly anti-moisture paper bag can be made by inserting pitched Kraft or such moisture prevention paper as poly ethylene paper in between the Kraft papers.

2. Market Potential: The main users of Kraft bags are the cement factories operating in the country. Currently flour mills, sugar factories, fertilizer and salt importers use bags made from synthetic material. In 2004, production of cement in the country was 1,415000 tons. Each 50 Kg of cements needs one Kraft bag; and 1,415,000 tons of cement requires 28.3 million Kraft bags. Additional cement factories are to be established in the near future. Hence within five years, the demand for Kraft bag will reach more than 45 million per year. Importing all these bags will consume a substantial amount of foreign exchange every year. Since the volume of demand justifies the establishment of a Kraft bag making plant, establishing this plant in the Amhara Region will contribute to the industrial development of the Region.

3. Source of Raw material: Main raw materials required include kraft paper, crepe paper, sewing thread, filter code, paste and ink. Some of the raw materials will be obtained locally.

4. Process and Technology: Kraft paper is put on the tubing machine, placing the number of sheets corresponding to the required number of ply, for simultaneous tubing and printing with a press inter locked with a tubing machine. Paper tube manufactured on the tubing machine is machine sewn on an automatic both-ends sewing machine, after the shaping of valve done manually. The finished bags are inspected and bundled into 20 or 25 bags per bundle. Main machinery and equipment needed include complete tubing machine, both-ends sewing machines, one- end sewing machine, packing machine, compressor, paste making machine and inspecting machine.

5. Estimated Investment: For a plant which can produce 10 million kraft bags per year, the required investment will be:-

 Building/shade 1750m2 at Birr 1500/m2 = Birr 2,,625,000

 Machinery and Equipment….………………. = Birr 2,500,000

 Working capital ……………………………….= Birr 900,000

Total = Birr 6,025,000

6. Benefits: Similar to other projects.

7. Location: Bahir Dar, Debre Birhan

7.16 Sensitizing Paper Making Plant

1. Product Description: Sensitizing paper is an indispensable item for use in civil engineering, architectural and plant designs. It is prepared by coating sensitizing liquid mixed with some chemicals on the base paper after making the surface of the paper smooth by using proper pigments. Sensitizing paper comes in blue and black colors and diazo-coated as it is common in most developed countries. The paper is used for preparing civil engineering and mechanical designs.

2. Market Potential: Construction of all types is expanding at the rate of 7-12 percent per year. In almost all parts of the country, one can witness construction works in commercial buildings, factories, public buildings (schools, clinics, officer) roads, etc. The preparations of designs and plans are prerequisite for all these construction works. And sensitizing papers are needed for the preparation of designs and plans. So far the sensitizing paper requirements of the country are being by imports. However, it is possible to produce the paper here at home. As out country has the least modern civil works, buildings and the like, there will be more activities in the preparation of designs and plans and in the construction of buildings and other civil works. This implies that the need for sensitizing papers will increase every year. For many years to come. Given this, we can not continue importing sensitizing paper while the demand for the product justifies the establishment of a plant which will produce sensitizing paper.

3. Source of Raw material: About eight types of chemicals are needed to produce the sensitizing paper. These chemicals include dihydroxynaphthalene – 6 sulfuric acid sodium salt, diazoethylethyl aniline chloride ½ zinc chloride salts, diazodimethyl aniline chloride-½ zinc chloride salt, K-606 (dye), paper etc. All the ingredients have to be imported.

4. Process and Technology: Pre-coating of the paper, drying, main coating, drying, back-coating, drying, cooling, rewinding, cutting and packing. In pre-coating the base paper is specially treated both on its surface and internally for making it suitable for further processing, Main coating is a process in which the sensitizing liquid blended with serval chemicals in addition to diazo and coupler is coated on the smoothened surface following the pre-coating. Back-coating is a process in which the final back-coating is applied in order to prevent a possible curling phenomenon on the sensitized base paper after preliminary and main coatings. Required machinery and equipment include coating machine, electric control box, rotary cutter, paper cutting machine, homo-mixer, electric chain hoist, radiation moisture balance, rewinding machine, chemical agitate vessel, auto P.P. strapping machine, copy machines for dry and wet, balances, viscotester, reflectometer and forklift.

5. Estimated Investment: For a plant which will produce 500 tons of sensitizing paper per year, the estimated investment will be

 Building/shade – 650m2 at Birr 1500/m2 = Birr 975,000

 Machinery ……………………………………….. = Birr 4,000,000

 Working capital ……………………………….. = Birr 900,000

Total = Birr 4,875,000

6. Benefits: Similar to other industries.

7. Location: Bahir Dar, Debre Birhan.

7.17 Blue Print Papers Making Plant

1. Product Description: Blue print papers are types of coated papers used to make photocopies of engineering designs and plans. These papers are widely used in civil engineering, architectural and drafting works. Once original designs and plans are prepared, several copies of these designs and plans are made using blue print papers. At a time when there are many civil engineering works, there is a large demand for blue prints papers.

2. Market Potential: As stated in many other project ideas, the construction industry (buildings, roads, bridges, dams and other civil works) is expanding at an unprecented level. As a result, consumption of blue print papers has been increasing every year during the last ten years. Unfortunately all the blue print paper requirements of the country have been met through imports. But there is a possibility of producing this product in the country. A plant that could produce one ton of blue print paper per day has the scale of economies which makes it financially viable.

3. Source of Raw materials: The main inputs are a type of paper or plastics made for this purpose and different kinds of chemicals. The inputs will be imported.

4. Process and Technology: The main purpose in the coating operation is to produce a sheet with an even semi absorbent surface for printing. This is affected by covering the fibers on the surface of the paper and filling hollows between them with finally divided matter, mixed with an adhesive or size when the paper is calendared. The result is a smooth even surface which reproduce the half ton lots of the printing plate much more accurately than any plain paper. The coating is applied in a continuous web of paper on one or both sides at the same time and at a speed to 1200 r.p.m.

5. Estimated Investment: For a plant which can produce 250 tons of blue paper per year, the estimated investment will be:-

 Building/shade 300m2 at Birr 1500/m2 = Birr 450,000

 Machinery …………………………………….. = Birr 200,000

 Working capital …………………………….. = Birr 300,000

Total = Birr 950,000

6. Benefits: similar to other project ideas.

7. Location: Bahir Dar, Debre Birhan.

7.18 Transparent Sheet Making Plant

1 Product Description: Acrylic cast sheet consists of mainly polymethyl methacrylate which may also contain small amount of co monomers to modify the bulk physical properties. These sheets are made in thickness ranging from 1mm to 25mm and almost in all types of colors. They have better impact strength over sheet glass and have replaced the latter in many applications. Acrylic sheet can be produced in transparent, translucent and opaque as well as in variety of colors and shades. The most outstanding characteristics are optical clarity, good outdoor weathering capacity, high strength to weight ratio and good dimensional stability. The main applications and uses of a cyclic sheet are building construction, automobiles, buttons, transparent casting, etc.

2 Market Potential: Transparent sheets (acrylic sheet) are mostly made with sizes of 3x5x3 and 4x4x3. Up to now the demand for transparent sheets is met though imports. A market study on this product has made a demand projection of 120 tons in 2008. After five years projected demand will reach about 160 tons. Considering the weight per unit area of a transparent sheet (which is very small) a demand of 120 tons or 160 tons is a large demand for transparent sheets.

3 Source of Raw materials: The main raw materials needed for producing transparent sheets are virgin monomer, benzoyl peroxide, pearl essence, steanic acid, colors and gelatine. Almost all the raw materials will be imported.

4 Process and Technology: The production process has four stages-mixing, heating, cooling, cutting and pressing, MMA monomer and benzyl peroxide are mixed together in a required proportion and poured into a mould which is made of two sheets of high quality toughened glass. The mould is heated, half sunk in water, and then the plastic cylinders from the mould are removed. Finally the plastic is cut to the required size and softened in hot water. The sheets are then taken out and pressed to make it flat. Main machinery and equipment used to produce transparent sheets are boiler, tanks, plastic containers, moulding machine, extra hard chromium mirror finished cylinders, cutting machine, press machines and other miscellaneous tools.

5 Estimated Investment: For a plant which will produce about 60 tons of transparent sheets, the estimated investment will be:-

 Building/shade 700m2 at Birr 1500/m2 = Birr 1,050,000

 Machinery …………………………………….. = Birr 500,000

 Working capital …………………………….. = Birr 300,000

Total = Birr 1,850,000

6 Benefits: Similar to other projects.

7 Location: Combolcha

7.19 Pencil Sharpener Making Plant

1. Product Description: Pencil sharpeners are commonly used by students, draft persons, engineers, bookkeepers and other people whose job require them to use pencils. It is made from a combination of hard plastic and metal or from metal only. Basically there are two types of sharpeners plastic pencil sharpener and aluminum molded sharper.

2. Rationale: In 2003/04, there were 10.3 million students from grades 1 to 10 in our country. All these students and those above grade 10 and other people who regularly use pencils need pencil sharpeners. And all the pencil sharpeners used in the country are imported. When one considers the student population of the country, it is clear that every year hundreds of thousands of pencil sharpeners are imported to the country. Given the technical simplicity of producing pencil sharpeners, it would have been possible to produce this product at home. But so far no attempt has been made to manufacture pencil sharpeners in the country. We believe that the time has come to start producing this product at least to supply the domestic market.

3. Market Potential: As indicated above, the potential buyers of pencil sharpeners in the country is more than 10.3 million. If we conservatively assume that at least 10 percent of the potential consumers buy pencil sharpeners, the one time demand for these products will be about 1.03 million. Suppose that one pencil sharpener serves about 6 months, total annual demand for the sharpeners by 10 percent of the potential consumers will be 2.06 million. Even with this conservative assumption, there is a huge market for plants which will produce pencil sharpeners.

4. Raw Material Source: Poly propylene (a plastic material) and stainless steel or aluminium are the main raw materials and these will be imported.

5. Process & Technology: Both plastic pencil sharpener and aluminum moulded sharpener are manufactured by moulding presses. To manufacture each type of sharpener separate moulds are required. The mould is adjusted in machine and the body of the sharpener is produced. The blades are fitted with screw in the body. Hand operated or motorized machines can be used for producing pencil sharpeners.

6. Estimated Investment: For a plant whose machines will be operated manually and whose production capacity will be 1000 pieces per day, the estimated investment will be the following

 Building/Shade 1000m2 at Birr 1500/m2 = Birr 150,000

 Machinery = Birr 40,000

 Working Capital = Birr 25,000

215,000

7. Benefits: Saves foreign exchange and regional financial resources, promotes self-sufficiency in industrial products, facilitates the learning process, and introduces new skills and technology.

8. Location: Bahir Dar.

7.20 Clips and Paper Pins

1. Product Description: A gem clip is a device made of bent steel or copper wire generally used for clasping or gripping together a collection of papers. Most gem clips have elevated noses on one side for easy slipping on to the paper collection. A paper pin is also a small device made of a thin and straight steel wire with a flat head at on end and a sharp pointed end at the other. The pin is also used for holding a small collection of papers by piercing them together. Gem clips and paper pins are used extensively in all areas where there is paper work.

2. Rationale: All the gem clips and paper pins requirement of the Amhara region are imported from abroad through Addis Ababa. With the establishment of new offices and other institutions in the region due to the decentralization of the administrative structure of the country, the consumption of office stationary materials like gem clips and paper pins has increased. The consumption of gem clips and paper pins in the Region will be sufficient to absorb the production of a small gem clips and paper pins producing plant. To promote self-sufficiency in these products and to save regional financial resources, the establishment of a gem clips and paper pins making plant must be promoted.

3. Market Potential: Since all gem clips and paper pins which the country requires are all imported, production of these stationary items in the country will be an import substitution exercise. It is a change in the supply source to meet an existing demand. The consumption volume of gem clips and paper pins in the Amhara Region constitutes about 25 percent of the total consumption of the country. This volume if produced in one plant will make the plant financially viable

4. Source of Raw Material: Both the steel and the copper wires will be imported.

5. Process and Technology: The manufacturing process of gem clips consists of the following stages:- winding of the wire on the shuttle; subjecting of the wound shuttle to the clip forming moving tools; nickel plating on the clips and packing of the gem clips. To make paper pins, wire is fed to an automatic machine wehere the wire straightened to upsetting of head pointed and cut into the required length. Main machinery required include: wire straightening and winding machine, clip forming machine, automatic paper pin making machine, electroplating unit, automatic nickel polishing machine, and packing machine.

6. Estimated Investment: For a plant which can produce about 10 tons of gem clips and another 10 tons of paper clips, the estimated investment will be as follows.

 Building/ shade 150m2 at Birr 1500/m2 = Birr 225,000

 Machinery = Birr 200,000

 Working Capital = Birr 100,000

525,000

7. Benefits: Promotes self-sufficiency, saves regional financial resources, and introduces new skills and technology.

8. Location: Combolcha, Bahir Dar, or any town to be preferred by the investors.

7.21 Hand Made Paper

1 Product Description: Generally paper is defined as all kinds of malted or filled sheets of fiber. Hand made paper is a paper made from fiber containing waste. The proposed product will be produced from waste paper, textile cuttings, agricultural waste and grass. Since the manufacturing process is labor intensive, the paper is known as hand made paper.

2 Market Potential: Paper products are used for a variety of purposes for writing, printing, duplicating, packaging and for other industrial and commercial uses. Currently the demand for paper in the country is met both from domestic production and imports. Consumption of a paper in a country depends on the level of economic development, the level of literacy rate of the population, on the development of the publishing and printing industry, the size of student population at primary, secondary and tertiary level. Generally least developed countries have the lowest level of per capita paper consumption. In Ethiopia, per capita consumption of paper is estimated to be between 0.5 kg to 1.0 kg per year, while in advanced countries the consumption level is move than 100 kgs per year. Even the low level of paper consumption in Ethiopia is not fully met by domestic production. According to a study made on the market for paper products, the demand for paper is projected to reach 148,000 tons in 2011. However, the current domestic production is about 17,000 tons per year. This clearly indicates that there is large captive market for paper in the country. This project idea is to exploit part of this captive market by establishing a plant which can produce hand made paper.

3 Source of Raw Materials: The main raw materials are waste paper, textile cuttings, agricultural waste, grass, caustic soda, bleaching powder and other chemicals. Almost all materials can be obtained from domestic sources.

4 Process and Technology: The main production or processing stages include collecting and mixing the various waste material inputs, grinding/milling the waste materials, blending the digested raw material inputs with caustic soda, adding the various chemicals and coloring materials, refining/beating of the pulp, moulding and forming a wet sheet, pressing the waste sheet and drying, and (finally) polishing the dried paper and forming sheets of paper as final product. About 17 pieces of machinery and equipment are needed for the plant. Some of the important ones are drag chopper, jute and grass cutter, digester for rags or jute, Hollander baiter roller, cylinder and auto vats for lifting purposes, hydraulic press with single ram cylinder and pumping unit drying chamber equipment, calendaring machine, paper cutting machine, knife grinder platen printing equipment, cutting machine, screen printing equipment, eyeleting machine, greasing machine and perforating machine.

5 Estimated Investment: For a plant that will produce 5000 tons of hand made paper, working 300 days per year with one shift/day operation, the estimated investment will be:-

 Building/Shade 3000m2 at Birr 1500/m2 = Birr 4,500,000

 Plant and Machinery ............................ = Birr 1,400,000

 Working capital................................... = Birr 550,000

Total = Birr 6,400,000

6 Benefits: Similar to other projects

7 Location: Combolcha, Bahir Dar, Debre Birhan, Debre Markos...

7.22 Paper Bobbins and Tubes

1. Product Description: Paper bobbins and tubes are industrial products made from paper and used for winding purposes. These products are widely used in the spinning departments of textile factories. As these departments are divided into different processing sections, different types of paper bobbins and tubes are required. There are paper tubes with only two paper layers, but some with 25mm of wall thickness as well. The length of the tubes can be 10mm as for a roll of cellophane type, or eight meters as for winding cores needed in paper mills.

2. Market Potential: Paper bobbins and tubes are used for winding materials on them for making these materials ready for storing, transporting or for gradual use. In the textile factories, different sizes of bobbins are used for winding textile threads of different thickness so that the threads become convenient for transferring to other processing sections such as weaving. In paper factories these bobbins and tubes are use for winding rolls of paper of different uses. Also in textile factories, they are used for winding rolls of finished fabrics. The textile, paper and the fiber factories are the main users of paper bobbins and tubes in our country. Although the technology of producing these products is relatively simple, they are still being imported to meet the demand of the above industries. As the numbers of textile and fiber factories are increasing, the demand for paper bobbins and tubes increases. Currently the demand is estimated to be around 5000 tons and the share of the textile factories in the Amhara Region is about 2000 tons. As paper bobbins and tubes are very light in weight, 2000 tons is a huge quantity. This demand size could justify the establishment of a plant which will produce paper bobbins and tubes. Excess supply could be exported to other regions.

3. Source of raw material: As the name indicates, paper bobbins and tubes are made from craft or kahki paper of relatively low quality. This input could be secured from the two paper factories of the country.

4. Process and Technology: Narrow paper webs which are necessary for tube winding are cut on a slitter/rewinder. The webs for the winder are drawn from unwind-stand. The paper rolls are mounted one after the other. The webs run over guides through the gluing equipment to the winding machine. The inside paper webs are glued in a glue bath while the bottom web and cover web are either glued in a single gluing units. The essential element of tube manufacturing is the spiral winding machine. Here the glued strips are led onto a fixed mandrel. A winding belt wraps itself one turning around the mandrel. Once the tube is formed, it is cut to the desired length by a forward moving saw or score-cut knife. The tubes are then taken to a combined labeling and cutting machine. There it will first be wrapped with a multi-pattern picture label and then cut into the required number of tubes by means of several cutting knives. Machinery required for the plant includes slitter rewinder, unwinding stand with gluing equipment, cutt-off device, tube re-cutting machine.

5. Estimated Investment: For a plant which can produce2000 meter of core per day and 500,000 meters of bobbins and tubes, the required investment is about.

 Buildings/shades 800 m2 at Birr 2000/m2= Birr 1,600,000

 Machinery and equipment..................... = Birr 3,800,000

 Working capital..................................... = Birr 1,000,000

Total = Birr 6,400,000

6. Benefits: Promotes self-sufficiency, saves foreign exchange, and brings financial resources to the Region.

7. Location: Bahir Dar, Combolcha, Debre Birahn.

7.23 Ball Point Pen Refills

1. Product Description: Ball point pen refills are the transparent plastic or metal tubes which contain the ink of a ball point pen. The refills are made to replace other refills when the inks inside the “old” refills are exhausted. The main advantage of using refills is that the consumer can use the ball point pen (the holder of the refill) for a longer time than the disposable type of a ball point pen. In this way, the consumer saves money by buying the refill only instead of the whole ball point pen.

2. Market: It has been a long time since ball point pens have replaced fountain pens. Almost all people who can write use ball point pens; and there is huge demand for ball point pens in all countries. Of course, the advent of the computer has decreased, to some extend, the demand for ball point pens. But still there is large demand for this stationery product every-where. The main consumers of ball point pens and their refills are students. In the Amhara Region alone, it is reported that there are about 3.7 million students (2006/2007). Ball point pens and their refills used by students of the Region and by their compatriots in other regions of the country are imported. If we assume that one student consumes about 10 ball point pens (using refills) per academic year that annual consumption of ball point pens or refills in the Amhara Region is about 37 million. If we suppose that other sectors of the Amhara society i.e. office workers, shop keepers, etc consume about 20 percent of the consumption of students, regional demand for ball point pens will be around 44.4 million (37 mill. +0.2 x 37 mills). With this demand, a number of plants which produce ball point pen refills can be financially viable.

3. Source of Raw Material: The main inputs for the refills will be ink, metal or transparent plastic tube and metal nozzle. These inputs will be imported.

4. Process and Technology: The ball pen refill making unit consists of small machines which can be installed even in a small hall adjust to a house. The machines are steel fabricated, sturdy, small and light. They can be easily operated by family labor with little training. The main machines used to produce ball point refills are ink filling machine, nozzle inserting machine, centrifugal machine, punching machine and hot stamping machine. All the machines can be fixed on a wooden table measuring 6” length, 18” wide and 30” height.

5. Estimated Investment: For a plant that will produce 2000 refills per day, the estimated investment will be

 Building/ shade 50 m2 at Br 2000/m2= 100,000

 Machinery (Tools) 90,000

 Working Capital 50,000 240,000

6. Benefits: Promotes self-sufficiency, saves regional financial resources, and contributes to the education system.

7. Location: Any Zonal capital

7.24 Production for Paper Cups and Plates

1. Product Description: These are disposable cups and plates made from thin paper material. Due to their disposable nature and attractive designs, paper crockery like cups and plates are used in some occasion substituting glass clean or plastic, stainless steel crockery. Paper cups and plates are used for serving foods and drinks during some informal social gatherings and parties. Paper cups and plates are relatively cheap to buy and there is no danger of breakages during use. They are very convenient to use and affordable almost by all income groups.

2. Market Potential: There are many occasions in the Amhara region where there are social gatherings during which foods and drinks are served. These include religions and national holidays, wedding ceremonies, cultural events, etc. During these occasions, people gather doors and out doors and are served with foods and drinks. It is at these times that people have the need of using paper cups and plates. As mentioned earlier, these products are affordable to buy and convenient to use and disposes of. The Amhara region has it share of demand for these products. Up to now and or from Addis Ababa. Admittedly due to limited knowledge of the use of these products, existing demand for paper cups and plates id limited to urban centers like Bahir Dar, Gondar and Dessie. However, awareness of the use of these products grows the demand for them which grow to justify the need of establishing a paper cups and plates production unit in the region.

3. Sources of Raw Material: The main raw materials re paper of certain thickness, wax and coloring material. Paper could be obtained from domestic sources; the other two will be imported.

4. Process and Technology: For making paper plates, the paper of required thickness is printed in desired designs and circle cut on a cutting machine. These are then pressed in suitable dies to the final shape and then packed. Cups are made in to pars. The printed part is cut and given desired shape by die cutting. The bottom and the upper part are then assembled in a screw press. The finished cups and plates are waxed by chipping in molten wax at suitable temperature.

The main plant and machinery needed include printing press, paper cutting machine, cutting and greasing platen other accessories like dies, moulds and testing instruments.

5. Estimated Investment: For a plant that will produce about 25 million paper cups and plates per year operating one shift per day, the estimated investment will be:

 Building /shade 200m2 at Birr 2000/m2 = 400,000

 Machinery = 100,000

 Working capital = 75,000

575,000

6. Benefits: Saves foreign exchange, has the potential of generating financial inflow to the region, substitutes expensive products.

7. Location: Bahir Dar, Combolcha, Debre Birhan

7.25 Egg Trays from Waste Paper

1. Product Description: Paper egg trays are industrial products used for holding eggs in poultry farms and in places where eggs are sold or stored. Egg trays made from waste paper are usually cheap and light which make them economical to be used by poultry farmers.

2. Market Potential: Poultry rising is one main income generating activity in the mixed farming system of the Amhara rural economy. It is very common in the Ahmara region to see women carrying eggs to be sold in the small urban centers located in every part of the region. But since there are no convenient household goods for holding eggs safely, eggs are broken which being taken to market places. This causes loss of income for many rural families. Poultry rising is also practiced in the urban centers of the regions and lack of a convenient egg holder is also a problem in the urban areas. Poultry farming for generating income will expand in the region in the coming years. Increasing quantities of eggs will be produced and supplied to the market. The need for a convenient product that will be used to hold eggs will increase. For facilitating the development of the poultry industry in the region, there is a need to establish a small scale egg trays producing plant in the region.

3. Sources of Raw Materials: Waste paper, other fibrous materials are the main raw materials and caustic soda these can be obtained from domestic sources.

4. Process and Technology: The waste paper is beaten with a stick and any dust and other undesired materials are removed. Then the waste paper is cut in to pieces using a cutting machine which can be operated either manually or electrically. The cut pieces are transferred to a beater and water is added and then the beater is set in motion. After storing the pulp for some time, Caustic soda is added (if needed). Now the pulp is taken to a dilution tank with the help of a pump. Dilution takes places with the addition of more water; next the mounding operation takes place. The moulds are made of wood. A wire gauge mould is fixed at the bottom of the wooden vats. When the pulp solution is stirred well, the bottom of the mould is removed. The water in the solution passes the mesh and comes out and the fibrous material deposit on the mesh evenly and takes-up the shape of an egg tray. The tray is then dried along with the wire mesh. The wire mesh is removed from the tray and after drying the trays are cut in to desired sizes and marketed.

5. Estimated Investment: For a plant that will produce 2,500,000 pieces of paper egg trays, the investment cost will be :

 Buildings/ shade 300m2 at Birr 2000/m2 = 600,000

 Machinery = 400,000

 Working capital = 150,000

1,150,000

6. Benefits: Facilitates the development of poultry farms, increases the income of poultry farmers, and improves the food supply of the region.

7. Location: Bahir Dare, Dessie, Gonder, etc

('Writing Pads Making Plant',

'Writing pads, notes books and ring books are made from paper sheets. The pads are commonly ruled, stiched, or made with rings. The pads are used by students, merchants, office workers and by the general public. The main purpose of writing pads is to write notes, draft reports, take minutes, document court cases, etc',

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' most of the domestic demand for writing pads is meet by imports. There is one factory (Yekatit Paper Processing Factory) which produces writing pads and the factory has a capacity of producing 500,000 writing pads and note books. According a study conducted in 1996, the domestic demand of writing demand was estimated to be 7.7 million in 1997. Growing at annual rate of 7.6 percent per year, the demand for writing pads was projected to reach 17.7 million by 200g. If we assume that the share of the Amhara Region will be about 26 percent (similar to the population share), demand for writing pads in the Region 2009 will be 4.6 million. This will justify the establishment of at least one medium size writing pads making plant in the Region. There is no reason why the Region should import products from abroad or from other parts of the country if these products can produced in the Region economically i.e with financial viability. ',

'The main “raw material” are wood free writing paper, printing ink, cover sheets, stitching or wring wire (metal or plastic) and corrugated boxes. Most of these inputs can be obtained from domestic sources. ',

' The production process begins by conveying long ribbon of paper size unwinding unit into a printing and ruling machine. The paper is lined. Then the ribbon crosses cutter cuts according to the width of the writing pad intended to be produced. The eat sheets of paper are contend and stacked. They are also perforated at one end if ring books are to be produced. The covers of the writing pads are automatically conveyed to the production flow. Then the paper sheets and the covers are stiched with coiled or staple wire. Machinery needed include unwinding unit, printing and ruling machine, rotary cross cutter, perforator, counting and collecting unit, stack sheet feeder, glve applicator, wire stiching unit, separation unit, collecting and discharge unit. ',

' Promotes regional self-sufficiency, saves regional financial resources, and saves national foreign exchange. ', ' 11', ' 1')