T POTENTIAL IN ARUNACHAL PRADESH

THE PROJECT SPONSORED

BY

THE GOVERNMENT OF ARUNACHAL PRADESH

THE REPORT PREPARED

BY

RAJIV GANDHI UNIVERSITY

RONO HILLS

Preface

This Report is the outcome of the research carried out in the Department of Economics over the last three years. In its preparation we have taken help and advice from all our Department Colleagues including Ph. D. Scholars and research assistants. Specifically, mention may be made of Prof. A. Mitra, Dr. Vandana Upadhya, Mr. Lijum Nochi and Mr. Maila Lama. Mr. Dil Bahadur Gurung did the initial field survey. At the last stage the field work on marketing was done by Mr. Gobin Ch. Boruah. Both Mr. Gurung and Mr. Boruah compiled and processed all data incorporated in the project. In computer work we received help from Mr. Vijay Kumar Prasad. We express our sincere gratitude to all of them. We are indebted to Prof. T. Mibang, Vice Chancellor, Rajiv Gandhi University, who provided many highly valuable suggestions. The Draft Report was submitted in December 2008. A workshop was held on 10th December 2009 in order to discuss the Report. All the participants put forward their suggestions which are incorporated in the final Report. We express our gratitude to all the participants in that workshop.

The officers of the Directorate of Trade and Commerce, especially its Director, helped us in completing this project. However, the project could not be completed in time because of our other responsibilities in the Department and acute scarcity of data which took a lot of time to collect and compile. The views expressed in the Report are based on observations and data relating to the state and the rest of the world. If the findings and recommendations incorporated in the Report prove useful in refashioning the Government policy, then we would consider our efforts meaningful.

(Prof. S. K. Nayak)
Secretary of the Research Team

(Prof. N. C. Roy)
Chairman of the Research Team

Summary

Foreign trade has been an inseparable companion of development. Being insular and being less developed are synonymous. That all developed economies are relatively open does not mean that trade is the cause of their development; for, there are many countries long exposed to trade but not yet developed. The distribution of gains between the trading partners depends on their relative productivity growth which again depends on their relative capacity for absorption as well as creation of new technology. An economy which is faster than others in the creation and absorption of new technology and very prompt in restructuring institutions in order to satisfy the needs of new technology can get a larger share of the gains from trade. In general, an economy which is technologically stagnant and depends on exports of raw materials and natural resources for foreign industries cannot gain much in the long run. On the other hand the economies exporting industrial goods whose production is subject to increasing returns and hence decreasing costs enjoy a large gain from trade. In more advantageous situation are the countries which export services such as IT, tourism, etc. and new technology in the form of patents or new products.

Given the empirical relationship between trade and development we can categorically state on economic grounds that Arunachal Pradesh should, without any loss of time, start all-out preparations for entering the international market. The people of the state have suffered much ï and are still suffering ï from many deprivations such as poor health, low literacy, inaccessibility, etc. because of its having been a late starter in launching the development programme. The Stateôs delay in launching the trade programme has constricted its growth of productivity and is prolonging the deprivations of the people. Many producers have suffered because of their inability to get remunerative prices for their outputs. This has restricted the expansion of the production possibilities in the state which is richly endowed with a variety of resources. It has natural advantages in the production of (a) a number of horticultural crops: orange, apple, pineapple, banana, etc. (b) floriculture; flowers and orchids, (c) plantation crops: ginger, turmeric, spices, tea, etc. (d) derivatives from medicinal plants, bio-diesel yielding plants, etc. Apart from this the state can become a prime centre of tourism in the entire country and earn good amount of foreign exchange. While suggesting this we assume all political constraints including inner line regulation to be given so that our argument rests mainly on economic feasibility and partly on environmental feasibility.

e adequate enough in the state for expansion of outputs for this to happen the producers must get remunerative prices for their outputs. The possibility of their getting higher prices increases if their sphere of marketing includes also the international market. Actual output depends largely on the price; with the increase in price there is normally expansion of output. If the low price of a commodity persists over a number of years, its output declines. In Arunachal Pradesh the outputs of different horticultural crops can be expanded to a great extent if only the farmers are ensured a better price and this is possible through exports. There are a good number of indigenous orchids in the state but their commercial cultivation is yet to begin in full swing, and this delay is due to delay in exploring the possibilities of foreign market.

That Arunachal Pradesh has a good number of commodities - apart from tourism which is a kind of service - with a significant potentiality for export can be accepted without doubt. But this is just one side of the picture. In a market economy supply is not enough, there must be demand. Normally in a market economy for many commodities and services the constraint is not supply, rather it is demand which puts a brake on the expansion of output. The simplest example is labour supply. The existence of supply of labour does not mean that it will all be employed; for absorption of all supply, there must be matching demand. In international trade the market is highly competitive. It is not easy to get a niche in such a market. So a high level preparation is called for. The following are the measures to be adopted for occupying a niche in the foreign market:

- Infrastructural facilities, both physical and social, must be adequately developed. To date physical infrastructures such as roads, water, electricity, etc have been emphasized. No doubt, without these physical infrastructural facilities development is unthinkable. These are necessary requirements but not sufficient. What are both necessary and sufficient are social infrastructure such as contract enforcement mechanism, standardized legal system and adequate provision of judicial services. Trade stands on credibility and smooth functioning of all contracts. So along with the physical infrastructure, the social infrastructure should be adequately provided. This will reduce transaction cost which is an important element of total cost of production.
- Technological upgradation should be a continuous process. Since technological knowledge has positive externality, the Government should take efforts for its wide spread diffusion.
- Quality control is very important in all spheres of trading, domestic or foreign.

are inseparable elements of marketing. In order to
vation is essential in all circumstances.

- The government should establish a foreign trade cell in the Directorate of Trade and Commerce and this cell should collect all information regarding the price, the demand conditions in foreign market, foreign production, cost condition, technology, etc.
- Foreign trade is inherently risky and risk can be reduced to a great extent through being equipped with adequate information about the foreign economies.

Chapter 1

Introduction

That development of a society is related to its trade and commerce with other societies can be taken to be an axiom. To date no society has been able to develop without being exposed to the competitive environment created by the international trade and commerce. However, the relationship between development and international trade is not a simple one; as such there is no unilateral causation from trade to development. True that all developed countries have since long have been exposed to international trade, but all countries exposed to trade have not been able to develop. International trade has favoured only a handful of countries, especially those whose resource endowments and technological capacity have enabled them to reap the benefits of increasing returns and decreasing costs. International trade is indeed very powerful but it is a risky instrument. A societyôs ability to get benefits from trade depends on how far it can raise the productivity of its resources. Societies with high abilities in inventions and innovations in both technology and institution have enjoyed a high productivity growth. It is precisely this category of societies which have harvested the largest benefits from international trade. On the other end of the spectrum, the societies which have not been progressive in innovations have suffered backwash effects from trade; that is, trade, instead of promoting, has rather stunted their prospects of growth. This is true not only for international trade, but also for interregional trade within the same country with high disparity in development: the technologically dynamic region is benefited by trade at the cost of the technologically stagnant region (This theme appears in classic form in Myrdal (1957)).

Given the historical experiences of development one can state unequivocally that trade is not a neutral instrument to be used by one and all and have the same intended effects. A host of factors interweave in a complex manner the relationship between trade and production system. A society with a production system which is characterized by innovation and competitiveness can gain from trade but a society whose production system is traditional and tends to depend on the export of primary goods can hardly get substantial gains from trade. So the gist of historical experiences is that development without trade is unthinkable but trade unless used productively can attenuate the basic forces of development.

Till independence there was no integrated economy in the state; rather there were many economies largely insular with little interaction with one another. There are 25 major tribes and a good number of sub-tribes in the state. Prior to independence each of the major tribes had its own economic system ruled by the community specific institutions. The technological configuration of a typical economy was traditional with little absorptive capacity for innovations. Most of these traditional economies were run on the principle of autarky. Of course there were varying degrees of autarky. The communities living near the plains of Assam and those living near the international borders did not depend much on autarky in view of their exposure to trade. It will be pertinent here to have a glimpse of traditional economies some of whose characteristics are still retained by the Arunachal economy:

(i) Predominance of agriculture

Jhum-based agriculture was the main source of livelihood of the overwhelming majority of the people. In the river valley permanent cultivation was practised. However the technology used in agriculture was too old to generate any significant surplus in a sustained manner. The small surplus could not develop the market. There was neither product market nor was there any factor market.

(ii) Mutual insurance

The productivity of the traditional economy being small, the societal net savings was insignificant. But agricultural production is subject to year-to-year fluctuations. The risk arising from the wide variations in production was mitigated by mutual insurance, an institutional support mechanism shaped by communitarian principle (Roy and Kuri 2001). Communitarianism strengthened, through different redistributive mechanisms, the security of livelihood but attenuated a family's ability as well as the incentive for savings and investment.

(iii) Lack of technological Dynamism

The technology of production remained traditional; there was neither any endogenous innovation significant enough to shift the production possibility frontier upward nor was there any induction of path-breaking new technology. Not that all production technologies were completely static, there were some changes but the magnitude of change was too small to exert any significant growth of productivity.

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uction and distribution were community specific; there was hardly any institution covering the inter-tribal transaction space. Disputes settlement mechanism within a community was highly efficient, a factor which tended to keep intra-tribal transaction cost very low. (Transaction cost is the cost of information, pre-contract negotiation and post-contract monitoring. In short, transaction cost is the cost of successful working of the contractual relationship). But no such standard mechanism evolved to arbitrate easily the disputes arising from inter-tribal transactions. This tended to keep the inter-tribal transaction cost high. It is indeed very difficult to isolate the cause from the effect in the relationship between cost of transaction and frequency of transaction. The usual relationship between the cost per transaction and frequency of transaction is negative: as the frequency increases the unit cost decreases. In the village community where there is face-to-face relationship, the transaction cost is insignificant but the transaction cost between two communities remotely situated may be extremely high. The marketable surplus in traditional economy being small, there was no compulsive need to go for transaction beyond the boundary of the community. So the low frequency of inter-tribal transaction might have been the basic factor behind their high cost. But looked at the other side, the high cost of inter-tribal transactions might have resulted in their frequency being small.

Economic Integration

The introduction of direct administration after independence of the country provided an institutional framework creating the inter-tribal transaction space. This extended the transaction boundaries of different communities which resulted in the emergence of the Arunachal economy. The boundary extension of different communal economies was not only lateral but was also vertical – they all got gradually integrated with the national economy. The integration opened the floodgate of changes: new technology was inducted, new institutions appeared and distribution mechanisms underwent deep transformations. The outcome of all these was translated into the upward shift of the growth trajectory of the Arunachal economy.

Performance of the economy

Arunachal economy started the journey of development in the years following the independence of the country. Guided by the Government's planning and the spontaneous participation of the people in the Government-sponsored development activities, the Arunachal economy achieved a growth rate which exceeded that of many other states of the country. Income data prior to 1970-71 being not available, it is not possible to give a

al economy for the 1950s and 1970s. However from conomy performed very well.

In 1970-71 Arunachal per capita income (proxied by Net State Domestic Product) was just 56 percent of the per capita national income. In subsequent years Arunachal economy grew faster than the national economy; this reduced the per capita income gap between this State and rest of the country. At the end of 1970s Arunachal's per capita income rose to be around 75 percent of the per capita national income. In the 1980s the growth of income in the State was higher than in the previous decade; it was also higher than the national average. This narrowed the gap between the per capita income in the State and that in the country. In the first half of the 1990s Arunachal's per capita income surpassed the national average. However, after 1996 the State's economic performance fell sharply compared with the national average. This pulled down Arunachal's per capita income below the national average. In short the basic thrust of the Arunachal economy can be characterized by its persistent movement towards expansion and growth.

Subsistence to Growth and Surplus

Different communal economies which got integrated into the Arunachal economy were technologically static and subsistence-oriented. The shift of motivation of production from subsistence to profit and from social redistribution of surplus to individual saving and investment was accompanied with the application of new technology to production and emergence of new institutions such as individual property rights, market and monetization of the economy. New technologies and availability of skilled migrant workers raised the productivity and generated surpluses. The reconfiguration of institutions especially property rights became instrumental in individualization of surplus and its transformation into investment. The economy became dynamic and its growth trajectory shifted upward. A good number of crops and products showed significant surpluses.

Local to Global Market

Rich endowments of resources, especially land and forest, represent the vast possibilities of expansion of output of certain products. Even without much investment it is possible to transform vast swathes of land into horticultural and floricultural gardens. Once the scale of orchardization is increased and floricultural activities are expanded their output cannot be absorbed by the local market; these must reach the market beyond the international borders. Not only the horticulture and floriculture but also a few others such as medicinal plants, ginger, tea, etc. enjoy natural advantages of a scale hardly found elsewhere. Their outputs can be increased to levels not absorbable locally, so opening the

ssary step to raise the scale of output of many products

However, cautious steps are required to be taken in view of the path to market beyond the borders being strewn with risk and hazard. Risk moves with profit. Profit, the basic raw material of investment and hence of growth, cannot be enhanced without expanding the boundary of trade beyond the borders and getting exposed to riskier environment. However, risk can be mitigated to some extent, by learning by doing, that is, by being engaged in action. It is necessary to start the action i.e. preparing for trade with foreign countries without delay.

The rest of this study deals with the identification of the potential exportable goods and services from the State.

Chapter 2

Nature of Production Activities

Prior to 1947 a typical communal economy was virtually a mono economy dependent largely on primary activities in which cultivation occupied the topmost position. There was no modern secondary or tertiary sector. After independence came the modern secondary and tertiary sector paving the way for technological progress, skill formation, occupation diversification and a sustained growth in the productivity of labour. The structural shape of the Arunachal economy changed markedly. The relative importance of primary activities as source of livelihood declined as high productive secondary and tertiary activities absorbed more and more people. As in 2004-05 primary activities consisting of agriculture, forestry and logging, fishing and mining and quarrying formed only 31 percentage of the State's income proxied by Net State Domestic Product (NSDP). The contribution by the tertiary sector in the same year amounted to 44 percent of the NSDP, the highest among the three major sectors of the economy. The remaining 25 percent of the NSDP came from the secondary activities, mainly construction.

Arunachal economy has experienced a rapid structural transformation. The primary sector which contributed as high as 59 percent of the NSDP in 1970-71 lost 28 percentage points in the course of next 35 years so that by 2004-05 its relative share in NSDP, as mentioned above, turned out to be only 31 percent. The fall in the relative share of the primary activities in NSDP was not accompanied with a commensurate rise in the relative share of the secondary activities. Rather it is the tertiary sector which expanded rapidly, its relative contribution to NSDP having risen by 23 percentage points during 1970-2005.True that the relative share of the secondary sector in NSDP expanded but the amount of expansion was as low as 5 percentage points.

The structural transformation in the State presents some peculiarities. The relative share of agriculture in NSDP has declined monotonically since 1970-71, a phenomenon which is generally observed. The most uncommon phenomenon that is found in the state is the decline in the relative share of the manufacturing. From a very low base, the industrial activities expanded in the 1970s, picked up in the 1980s and since the 1990s the industrial

is deindustrialization, an affliction which the State has ndustrialization having been deeply rooted in the State. The decline in the relative share of industry has not been associated with the emergence of any productive sector which could play a leading role in the growth of the economy. The activities which are persistently growing in the State belong to the tertiary sector, the category which is largely supportive of directly productive activities. The pattern of structural transformation in the State bears an apparent – more appropriately, specious ï similarity with what the economies with the higher level of development have experienced: a progressive movement from agriculture to industry and from industry to services. But in Arunachal Pradesh the movement is from agriculture to service, skipping the industry, which is not the usual pattern.

Industrialization is mechanization of the process of production involving its organization in factories and mills, an arrangement enabling division of labour and specialization which is the source of higher efficiency and innovation. An industrial economy is propelled by the productive use of science and technology, and the height of its growth trajectory is determined by the rate at which the technological change takes place. When the Schumpeterian trilogy - invention, innovation and diffusion - become routinised, the industrial economy matures into post industrial economy which is dominated by the service sector. An industrial economy can be characterized as one whose main production is commodity but in the postindustrial economy the Schumpeterian trilogy becomes the most dominating factor. To press this point home, the shape of the growth path of industrial economy is determined by its technology-absorbing capacity and growth of a postindustrial economy is shaped largely by its technology creating capacity.

The structural transformation in the Arunachal Economy has not taken on this well-trodden route. The State could not achieve any industrial depth; its industrial output could never rise up to even 7 percent of its NSDP. Efforts were made to industrialize the State. A good number of industries were established by the Government. But these units suffered losses and they could not survive long. Though the industrialization could not make a breakthrough, it did not affect the expansion of the tertiary sector. In the usual case, the expansion of different services is conditioned in the initial stage by the growth of mainly industry and partly agriculture, but in the State the expansion of services did not depend

ertiary sectors. The tertiary sector has grown rather growth has been largely fed on the inflow of funds from the central Government.

Though the lack of industrialization did not stand in the way of expansion of services, yet this lacking has badly affected the expansion of horticulture, floriculture and plantation in the State. The chain of activities on a crop between its harvesting and marketing are value-additive in nature and form the basis for realizing its higher value. These activities involving different process including preservation fall mainly in the industrial category and partly in the service category. The absence of these value-adding facilities in the state is responsible for the farmersônot getting the remunerative prices for their products. It is frequently seen in the post-harvest period in some commercial crops-growing areas of the state that some crops like orange, ginger, etc. have been left in the field and they are suffering deterioration. Their price is so low that it will not even cover the cost of their harvesting and transporting to the market which may be far away. So the rationality of the farmers guides them to let their low-priced crops get decomposed in the field. It is also seen in the state, though not very frequently, that the farmers upon being advised by extension officers switch over to the cultivation of commercial crops such as ginger. They start the cultivation with all enthusiasm but when they find a price which is very depressing, they abandon their cultivation. This badly affects the process of commercialization of agriculture, its modernization and its overall growth and development.

A basic factor which is, to a great extent, responsible for non-advancement of commercialization of agriculture in the State is lack of industrialization, and industrialization is not there because marketing facilities, among the other factors, are not developed in the State. This is a kind of chain relation or in a more strong language a vicious circle. Price makes a nose dive in the post harvest period because preservation facilities are not developed; these facilities cannot be developed because electricity is not there, and electricity is not there because demand for electricity from commercial concerns does not exist. Most of these problems can be eliminated through industrialization and developing proper marketing facilities. Marketing facilities are not complete unless the foreign market is encompassed in the overall planning of marketing. That is, the problem should be approached on the basis of the premise that the market should extend to the whole world and the producer should get the benefit of the highest price available to his product in any part of the world.

int to have a glimpse of the effect of industrialization on export. Table 1 shows the export performance of the major exporting states of India. A few other variables also appear in the table. The table provides a very positive outcome of industrialization so far as export is concerned. In general highly industrialized states are the largest exporters. In the country Gujarat is most industrialized ï almost one third of its income comes from the industry ï and Gujarat has the highest export per head among the States and Union Territories. Even Delhiõs export appears dwarfed compared with Gujaratõs and this is because Delhi is dominated by the service sector, not by the industrial sector: only 10 percent of the income in Delhi comes from industry. The overall relationship between the export and industrialization is captured statistically in correlation: the coefficient of correlation between per capita export and share of industry in Net State Domestic Product is 0.62 which is statistically significant. This gives a very relevant point to ponder and suggest a strategy for export-led development. Marketing is related to industrialization and industrialization is related to export-performance. The producers in Arunachal Pradesh can be helped if they are enabled to get the remunerative price. The possibility of their getting the highest price available in the world is opened up if only they are able to sell their product economically, through the efficient marketing mechanism opened up to them by the Government. And this would be facilitated if the processing industries are developed in the State.

Table 1.1

State level Relationship between Export, Industrialization and Per capita income.

(Export in US Dollar and

State	Export in US million $	Share of Indian Export	Growth Rate of Export	Per Capita Export (Rs)	Per Capita income	Growth of Per Capita NSDP	Population (06-07)	Share of Industry (in %) in NSDP (2004-05)
Maharastra	36143	28.6	13	13310	37081	2.41	108616	20.98
Gujarat	24209	19.2	66.1	17051	34157	2.91	56792	31.84
Tamil Nadu	13097	10.4	29.4	7891	29958	4.47	66390	18.15
Karnataka	12676	10	13.8	8767	27291	5.64	57832	18.30
Andhra	5479	4.3	35.9	2665	26211	4.43	82230	16.94

				11364	61676	4.98	17177	10.29
West Bengal	4011	3.2	12.6	1826	25223	5.39	87843	13.10
Haryana	3792	3	16.1	6238	38832	3.01	24315	24.48
Uttar Pradesh	3632	2.9	7.2	769	13262	1.28	188962	13.31
Rajasthan	3356	2.7	20.3	2066	17863	3.56	64973	17.28
Kerala	2293	1.8	16.1	2739	30668	5.64	33483	10.59
Punjab	2148	1.7	-8.9	3184	34929	2.51	26982	15.32
Madhya Pradesh	1993	1.6	25	1170	15647	2.28	68129	17.25
Orissa	1971	1.6	35.5	1969	17299	2.16	40033	19.21
Others	6680	5.1	.	.	.	.	.	
India	126360	100	22.6	4406	25716	11.8	1147067	

Per capita income in Rs)

Note:-

1) Share of export is the percentage of total Indian export.

2) Per capita income (NSDP) is for 2003-04 and per capita Export is for 2006-07.

3) Growth of NSDP and Export are in percentage. Growth of income is for the period of 1993-94 to 2003-04 and growth of export is for 2006 to 2007. Per capita income is at current prices while growth of per captia income is calculated on NSDP with base 1993-94 , the growth of export is calculated at current dollar price.

Data sources:

4) Economic Survey 2007-08 Government of India and Handbook of Statistics of Indian Economy by RBI. Only those States are considered whose export constitutes at least 1% of Indian export.

Chapter 3

Determination of Export Potential

The amount of export of a commodity is dependent on its international price relative to its domestic price. So at a given price ratio of the commodity, its export represents the surplus over its domestic demand and international trade can be treated as the óventôfor this surplus. In the absence of international trade the determination of surplus is difficult especially when there is perfect price flexibility in the market. However, perfect flexibility of price or its opposite, perfect inflexibility, is most unlikely to be found in practice. This provides a scope to identify the surplus as a function of the behaviour of the price. If due to excess demand the price in the current year rises above the normal market-clearing level, then output in the next period would be raised. So if the current price is anticipated to prevail in the next period, then there is likely to be a positive excess supply. The behaviour of deficit and surplus is like this: because of previous periodôs low price there is ódeficitôin the current period which tends to raise the current yearôs price. Based on this high price if the production for the next period is planned then there appears a ósurplusô

This can be understood better with the help of a diagram. In diagram 3.1 D represents the demand curve and S the supply curve.

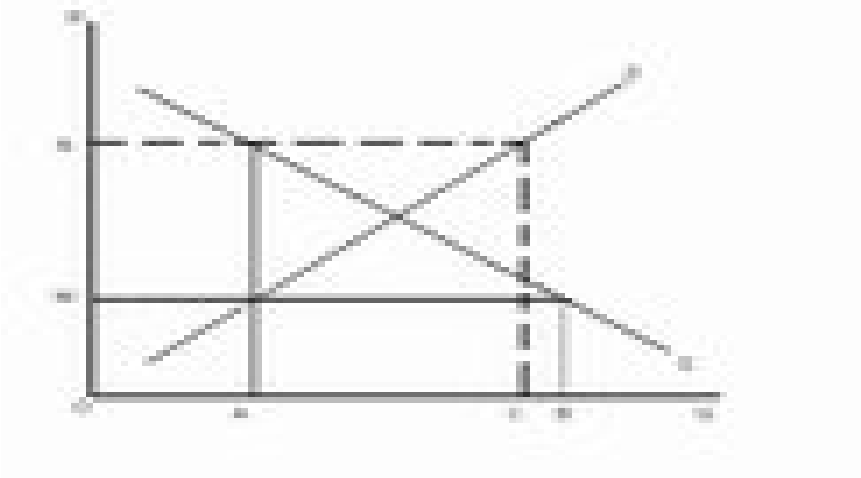

Diagram 3.1: Price behaviour and Surplus

ation is static and there is a lag of one period between utput. A price of OM in the previous period entails an output of OA in the current period. This causes a gap between demand and supply. There is an excess demand to the tune of AB. This is current yearôs deficit which escalates the price to ON. The producers expect this price to prevail in the next period and accordingly raise the output to OC. The outcome is excess supply amounting to A. This case, though very simple, illustrates a fundamental relation between price and the output. It can be extended to international trade. If the foreign price is higher than the domestic price, then there will be an exportable surplus. But if the foreign price is less than domestic price, then the commodity can be imported from abroad. Only when the foreign price is the same as the domestic price there will be no possibility of export or import. This shows the singular importance of price, more properly relative price or cost condition, as the determinant of foreign trade.

The domestic price of a commodity may be pulled down by an excessive production causing huge losses to the producers but even in such a situation foreign trade may not turn out to be a saviour because foreign price might be lower than the domestic price. The price of a commodity basically reflects its cost of production and availability of inputs and their cost. In a long-run perspective the cost of a commodity depends on the rate of technological improvement in its production and behaviour of input prices. Input prices again depend on their availability and more crucially on the skill of labour and the institutional configuration of the economy which determines specifically the transaction costs. The transaction cost is usually a substantial element of cost. If property rights are well-defined and the working of the factor markets is highly efficient then transaction cost is low. Ill-defined property rights and weak contract enforcement mechanism lead to a high transactions cost and hence a high overall cost of production. Even induction of new technology being at least partly dependent on the institution, it is the set of rules and regulation and their operational efficiency which ultimately sets the overall cost condition in production and marketing.

An economy capable of improving its technological condition easily and enacting appropriate changes in institutional environment can enjoy a decreasing cost, a situation which constitutes the prerequisite for reaping gains from international trade. Thus the relative price (the ratio of foreign price to the domestic price) translates into relative cost (the ratio of foreign countryôs cost of production to domestic cost) and the relative cost translates into relative techno-institutional improvement and skill of labour or human capital, which ultimately determines the divisions of gains between the trading partners.

y competitive. A gainful participation in a competitive f technique and growth in overall efficiency, the factors which tend to enhance the productivity and reduce cost. However an important element of cost is transaction cost which depends on the institutional structure of production. The capacity of the society to enact the appropriate changes in institution as demanded by the efficient organization of production holds the key to reducing transaction cost.

In what follows we try to highlight the range of goods and services in which the State has the comparative advantage. An in-depth study of this nature demands a huge body of time-series data on inputs, outputs, prices and consumption in the State so that production and cost functions of different commodities can be estimated and the time path of their future consumption can be projected. But secondary information on inputs and their prices is not available. In the absence of such information it is not possible to estimate either production function or cost function. So as a preliminary investigation we turn to the basic endowment of different inputs and try to find out the production possibilities of different commodities and services in the state. The data on consumption of different commodities are taken into account in order to estimate their surplus generated in the state.

Resources in the State and their uses

The endowments of various resources in the State have been reported so eloquently - sometimes even in poetic language - that it would be pointless to repeat it. A highly realistic assessment of the State's resources appears in the State Development Report of Arunachal Pradesh to be published shortly. In spite of the richness of the resources having been well known, it is not yet known how this richness can be transformed into a value which would maximize the welfare of not only present generation but of all future generations. This is a fundamental issue associated with the mode of use of any resources especially in a state like Arunachal Pradesh where about 95 percent of land is slopy and environmentally fragile. In such an ecologically vulnerable environment a particular resource may have a high in-situ value but realization of its instrumental value may yield transitory positive effects but permanently recurring negative effects.

This can be clarified with an example which is of course very common place. Well-grown trees on the hill slope normally have a high in-situ value but in order to benefit the

e cut and their one time value is realized it may have generation. The cutting of trees may cause soil erosion and even landslide resulting in the degradation of not only the side of the hill but also its foot. So the one time value – even very high value – may be much lower than the cost inflicted on the present and future generations. Instead of realizing one time value - especially when it cannot be invested - if some alternative uses of these trees are found through, for example converting the area into a park and promoting nature-based tourism, then the trees may be a source of income for many years. The implication of this example is very simple. The existence of resources does not necessarily mean that these can be utilized easily and socially desirable output can be produced in a sustained manner. It all depends on the mode of their utilization; that mode is to be chosen which shifts the trajectory of the social welfare upward permanently.

The technique which is usually employed to find out the appropriate use of resources is social cost-benefit analysis. With our present status of information it is not possible to rigorously apply it. However while estimating production possibilities of different goods and services in the State we keep in our purview the social cost benefits aspects.

Commodity Composition

Traditionally a rice-growing area, Arunachal Pradesh has now a diversified economy. New crops have been introduced in agriculture. Industrial units have been established and service sector has expanded. The orchards of the state are producing apple, orange, pineapple and a variety of other fruits. Plantation activity has witnessed the burgeoning of tea gardens and growth of rubber and other crops. Though in the nourishing soil of the state, a good number of crops have flourished generating even exportable surplus, the soil of the State has not yet been able to nurture modern industries. The main source of industrial output is traditional crafts produced mainly in small scale, sometimes at home. In the service sector research and development wing is yet to be established and IT sector is still in the fledging state. Given this condition the exportables in the State consist of largely the resource-based products. Though various handicrafts are there, their products are also based on the locally available resources such as bamboo, cane, etc.

Major Exportables

Concentrated mainly on the two districts, Tawang and West Kameng, apple production in the State amounts more than nine thousand tonnes per year. During the triennium ending in 2006 average production of apple was 9454 tonnes which is 0.45 percent of the country's production of about twenty lakh tonnes. India is not a large producer, its apple output being only 3.11 percent of the world's. Production of apple per head is about 1.8 kg in the country and 8 kg in the Arunachal Pradesh. Per capita production of apple in the world is about 10 kg (FAO 2008). China is the largest producer with an output which is more than one third of the world's total. Chinese production of apple per head is about 21 kg.

Given the world's per capita consumption - and production - of 10 kg, if a per capita consumption of this order is applied to Arunachal Pradesh, then apparently there is no surplus. Rather there is potential deficit to the tune of 2 kg per head. This is simple arithmetic, of course too simple to carry any weight. In the first place consumption behaviour is shaped by a large number of factors such as taste and preference, income, price, etc. so that there is no reason to believe that the people of the state have the same preference as the rest of the world. Secondly, comparative advantage is not something which is permanently fixed; rather it is ever changing.

The technological change and the human capital formation have not grown at the same pace everywhere; the countries which have been successful in adopting appropriate technology and keeping the cost of production low have enjoyed comparative advantage. For example in the 1950s the USA was the largest manufacturer of cars producing about 80 percent of the world's total. Then in the 1960s Japan appeared at the scene and gradually it occupied a significant part not only of the world market but also of the USA market. It was the low cost of the Japanese cars which squeezed the market of high-priced American cars. Such examples can be multiplied. So comparative advantage is dynamic; it shifts from industry to industry and country to country. Thirdly, and most importantly, Arunachal Pradesh has some natural advantages in the production of apple. The agro-climatic conditions of a large part of the state are suitable for the production of apple and other fruits.

nd in apple production because of largely historical and ıtroduced in the state only a few decades ago. In the course of just few decades apple cultivation has spread in the state, but the rate of diffusion has been low because of inaccessibility of many areas. Table 3.2 shows the growth of apple production in the state.

Table 3.1

Production of Apple in Arunachal Pradesh.

(*Production in MT)*

Year	Production	Change in production	Growth rate	Production Index
2001-02	8508	-	-	100
2002-03	8588	80	0.94	100.94
2003-04	8846	258	3.00	103.97
2004-05	9288	442	5.00	109.17
2005-06	9474	186	2.00	111.35
2006-07	9600	126	1.33	112.83
2007-08	13464	3864	40.25	158.25
2008-09	14541	1077	8.00	170.91
2009-10	15704	1163	8.00	184.58

Source: i. Statistical Abstract of Arunachal Pradesh. Directorate of Economics and Statistics, Itanagar; different years.

ii. New Agricultural Policy, Department of Agriculture, Government of Arunachal Pradesh, Itanagar (2010)

During 2001-06 apple production increased at the average yearly rate of 2.7 percent. Given the prospect in terms of the land and climate, we can assert that apple has a strong potential of being an exportable from the State.

most of the areas of the state are suitable for the cultivation of orange and other citrus fruits. All the districts in the state have taken advantage of these favorable agro-climatic conditions and have started producing orange. However, the quality and quantity vary from district to district. In terms of quantity Siang region is the highest producer and inter terms of quality Wakro area appears at the top. However, by appropriate crop selection the quality of orange in other areas can be raised easily. Arunachal Pradesh is an important producer of orange; its production in 2006 was 27 thousand tonnes which is 0.88 percent of the country's production of about 31 lakh tonnes. India produces about 5 percent of the world's total output of 6.17 crore tonnes. Production per head in the State is 21 kg against the national average of only 3 kg. Production of orange per head in the world is about 10 kg, the same as apple (FAO 2008). Table 3.3 shows the trend of orange output in the State during 2002-06 and table *A2* in the appendix shows the district wise output. In 2002 the State produced 24 thousand tonnes of orange which increased to 27 thousand tonnes in 2006, a growth of more than 12 percent. However, the average yearly growth during 2002-06 is about 3 per cent, much above the growth of population in the State. Given the favourable agro-climatic conditions growth of orange outputs can be increased to a higher rate. It is a common knowledge in the State that the orange producers do not get the remunerative price. The appropriate response to this problem consists of raising the marketing capability and extending the market beyond the international borders.

Table 3.2

Production of Orange in Arunachal Pradesh

(*Production in MT)*

Year	Total Production	Change in production	Growth rate	Changing Index
2001-02	24041	-	-	100
2002-03	25296	1255	4.96	105.22
2003-04	19300	-5996	-31.07	80.28
2004-05	26747	7447	27.84	111.26
2005-06	27283	536	1.96	113.49

Source: Statistical Abstract of Arunachal Pradesh. Directorate of Economics and Statistics, Itanagar; different years.

is traced to south-east Asia, yet given the wild varieties of banana growing naturally in different parts of the State, one feels compelled to gather that Arunachal Pradesh might be one of the birth places of the fruit. Banana is produced in all districts of the State, the largest producers being East Siang and the lowest, Tawang. Most of the production takes place in the lower region of the state. Arunachal Pradesh produced an output of 14 thousand tonnes during 2006. This, in per capita terms, translates into 12 kg, the same as world production per head. India is the largest producer in the world, its output in 2005 was 16.8 million tonnes being 23.2 percent of the world output of 72.5 million tonnes (FAO 2008).

The soil and climatic conditions in most of the areas of the state are highly suitable for the cultivation of banana. Moreover, banana plants being highly efficient protectors of the soil can be grown on the hillsides even with a substantial slope. Slopy lands suffering soil erosion can get a protective cover if banana plants are cultivated there. So, ecological fragility renders banana a suitable crop for the State. Apart from its eco-friendliness it has a high potentiality as an exportable. The entire cold belt covering all the developed countries is the importers of the fruit. However, it is difficult to export some varieties of banana because of their short shelf life. For export purposes, crop selection is a necessity; those varieties to be selected which are of good quality and at the same time have a long shelf life.

Table 3.3

Production of Banana in Arunachal Pradesh

(*Production in MT)*

Year	Total Production	Change in production	Growth rate	Changing Index
2001-02	11383	-	-	100
2002-03	12354	971	8.53	108.53
2003-04	12981	627	5.08	114.04
2004-05	13087	106	0.82	114.97
2005-06	13045	-42	-0.32	114.60
2006-07	13603	558	4.28	119.50

		5863	43.10	171.01
		1557	8.00	184.69
2009-10	22705	1632	8.00	199.46

Source: i. Statistical Abstract of Arunachal Pradesh. Directorate of Economics and Statistics, Itanagar; different years.

ii. New Agricultural Policy, Department of Agriculture, Government of Arunachal Pradesh, Itanagar (2010)

Pineapple

A highly demanded fruit in the international market, pineapple orchards are commonly seen in many areas of the low attitude districts of the State. Pineapple is not grown in the high altitude districts such as Tawang and West Kameng, where temperature in the winter falls drastically. The State is a good producer of pine apple. Table 3.5 shows the pineapple production during 2002-06.

Table 3.4

Pine apple output in Arunachal Pradesh

(*Production in MT)*

Year	Production	Change in production	Growth rate	Changing Index
2001-02	31387	-	-	100
2002-03	33900	2513	7.41	108.01
2003-04	33978	71	0.23	108.26
2004-05	34657	679	1.96	110.42
2005-06	35354	697	1.97	112.64
2006-07	47405	12051	25.42	151.03
2007-08	51197	3792	7.41	163.12

Source: i. Statistical Abstract of Arunachal Pradesh. Directorate of Economics and Statistics, Itanagar; different years.

ii. New Agricultural Policy, Department of Agriculture, Government of Arunachal Pradesh, Itanagar (2010).

growth of output of pineapple production in the State in e output grew at the average rate of 2.6 percent per annum. Arunachal Pradesh is an important producer of pine apple in the country. Given its agro climatic conditions the State would be able to expand its production further and export a substantial amount.

Ginger

An important crop in the State, ginger is produced in all its districts. The soil conditions and high rainfall in the state are suitable for its cultivation. Its production in 2006 was about 20 thousand tonnes, an amount which translates into 15 kg per head. This left a substantial amount to be disposed of in the rest of the country. Table 3.6 shows the ginger output in the State during 2002-06. The table reveals a pathetic picture of ginger production in the State. The output was high in 2003. But it fell drastically in the next year. In subsequent year it hardly picked up. The simple reason: the farmers suffered losses because of very low price hence some of them even abandoned its cultivation.

Table 3.5

Ginger output in Arunachal Pradesh

Year	Production	Change in production	Growth rate	Changing Index
2001-02	32259	-	-	100
2002-03	33819	1560	4.84	104.84
2003-04	19247	-14572	43.09	59.66
2004-05	19631	384	2.00	60.85
2005-06	20023	392	2.00	62.07
2006-07	42821	22798	113.86	132.74
2007-08	47407	4586	10.71	146.96
2008-09	47190	-217	-0.46	146.28

stract of Arunachal Pradesh. Directorate of Economics and gar; different years.

ii. New Agricultural Policy, Department of Agriculture, Government of Arunachal Pradesh, Itanagar (2010)

Ginger is one of the commercial crops in the State which were supposed to spearhead the process of modernization of agriculture through weaning away the farmers from low productive jhum cultivation but to date these crops have not succeeded much in showing their commercial prowess. In view of their being an undependable source of income, they have almost failed to become the viable substitute of the main subsistence crop of jhum cultivation, namely rice. The reason is not far to seek. The limited marketability of the products has played havoc with a smooth flow of income; the producers have suffered and they have not given up their traditional practice, jhuming, which hardly generates a surplus. The solution to the problem is simply to extend the boundary of market beyond the borders.

Apart from the crops discussed above there are a good number of other products in which the State has a comfortable advantage and they have all potential to be exportable. Turmeric, for example, is akin to ginger in that the same agro-climatic conditions are suitable for both of them. The State has sufficient scope to expand the cultivation of turmeric.

Floriculture

The state is home to many flowers and orchids which have a high demand in the foreign market. However, full-scale commercial cultivation of flowers and orchids is yet to begin in the State. In order to promote the cultivation of flowers and orchids, it is not necessary that concentration should be only on the local varieties. It is rather the pattern of foreign demand which should be taken into account. Mizoram, for example, had advanced much in the export business of flori products, but in crop selection it has taken into account the foreign demand conditions.

As reported by Konwar (2008) Mizoram introduced anthurium flowers in 2002. Seeds and required materials for the cultivation of these flowers were imported from the

ix years Mizoram emerged as the largest producer of lity of these flowers produced in Mizoram is so high that they have found a very good international market. Nowadays these flowers from Mizoram are exported to UK, Japan and other countries. Arunachal Pradesh is better situated agro-climatically and is much larger in size than Mizoram. What is necessary for Arunachal is a substantial investment in cultivation of flowers and orchids and the State should try to take advantage of ever expanding foreign market.

Medicinal and other Plants

In the state there are many medicinal plants some of which are very famous, for example, Coptis Teeta. In the international market there is increasing demand for herbal medicines. In view of this the export of medicinal plants has a bright future, provided these plants are cultivated at the commercial scale. Not only in medicinal plants, but also in a variety of unique biological products the state has a comparative advantage. What is, however, necessary is their commercial cultivation. The state will be benefited further if it can establish processing industries and add value to the raw products.

Handicrafts

The demand for handicrafts, especially those produced with a high degree of craftsmanship, is highly income-elastic; with a rise in income many people go for more and more of such products. Unlike machine-made goods, handicrafts can simultaneously meet two types of needs: one is instrumental need and the other is artistic need. Arunachalôs handicrafts, given their quality, can get a market not only in the rest of the country but beyond its international borders. However, in a dynamic world tastes change rapidly. So monitoring of the market is necessary in order to keep abreast of the customersô preferences.

Fish

The state is well-endowed with water resources. Except a few months there is rainfall throughout the year. This keeps the rivers perennial and makes the pond maintenance cheap. Apart from this, there are a good number of indigenous ornamental fish species with high demand in the foreign market. So in pisciculture, the state can enjoy a comparative advantage.

ers and pesticides in the state is still limited in the production of agricultural and plantation crops. Horticulture also remains relatively free from chemical fertilizers and pesticides. This makes Arunachal products highly attractive in the growing national and international market for organic products.

Off-season vegetables

Most of the area of Arunachal Pradesh is hilly and its river valleys are not subject to flooding as the plains of Assam and other states are. This gives the state an advantageous position in terms of production of off-season vegetables. Parts of Meghalaya and few other hilly regions of the country have taken care of these positional advantages harvesting off-season vegetables and earning handsome income. Arunachal Pradesh has high potential in the production of off-season vegetables.

Tourism

Apart from goods, the state has the vast possibility of offering a unique service ï tourism - which can earn a huge amount of foreign exchange for the country. Different types of tourism can be developed for the high spending foreign visitors.

Constraints

Export potentialities are vast but constraints are also forbidding in the State. The whole ranges of Infrastructural facilities are to be constructed; especially important is the social infrastructure, like property rights, standardized legal system, contract enforcement mechanism, etc. The technological level of the production is low. The induction of new technology is not easy and organizational mechanism is weak. Till today the State has not been able to construct required number of cold storages. Packaging facilities are still inadequate.

The constraints appear to be insurmountable. However, the indomitable spirit of the people who have strengths in different areas such as proficiency in English, open mindedness, etc. would be sufficient to overcome all obstacles and the State would occupy an important position in the export map of the country.

Chapter 4

Conclusion and Policy Measures

As population of the country and elsewhere is on the increase, there will be need for enhanced food production on the plains, so it will be difficult to expand the area under horticulture, floriculture, bio-diesel yielding plants, etc., there. A move from the plains to the hills shows that agricultural activities consisting of food grain production cannot be easily intensified on the slopy land. The hilly regions enjoy a comparative advantage in horticulture, floriculture, production of medicinal and other valuable plants, apart from production of some services such as tourism. This natural advantage should be taken care of fully, especially because the types of crops – fruits, flowers, etc. – that Arunachal Pradesh can excel in production are more income elastic than the foodgrains.

The opening of the foreign market would expand demand for the types of crops in which Arunachal Pradesh has comparative advantage; the producers will be able to make a switchover from low-valued foodgrains to high-valued horticultural, floricultural and other products. Farmers would also have the option to specialize in the production of organic foodgrains which have a growing international demand. Once the foreign trade is opened up, the product mix in the economy will be at least partly determined by the foreign demand. If a particular variety of orange, for example, has a good international market, the producers would gradually switch over to the production of that higher-demanded variety. Given the complexity and inherent risk in market in general and foreign market in particular, the Government should take all possible measures to protect the domestic producers.

POLICY MEASURES

The following policy measures appear relevant:

- **Market information**

  Information on foreign price, demand condition, cost condition, etc. is very essential in the promotion of trade. The Government should establish a specialized cell in order to collect all this information.

moted through non-governmental agencies with proper regulatory system or directly by the Government. It is possible only through developing the growersôco operative and linking them with the bulk of purchasers such that the economy of scale is realized.

- **Technological upgradation**

  The extraction of resource contained in an object depends on the availability of appropriate technology. In the absence of required technology and know-how the potential resource may lie unutilized or may even go waste. The simplest example is orange peel. Most of the people in our country throw it away not knowing that it has multiple uses. However, even if they know that value can be added to it, they cannot utilize it because appropriate technology is not available to them. Foreign market is highly competitive. In order to survive in the foreign competition, efficiency must be raised and cost reduced. Upgradation of technology is a necessary step to keep the cost of production low. However technology adoption is indeed a difficult task. Prior learning is necessary but in learning, there is the well known phenomenon: the positive externality .The private benefit from learning is less than its social benefit and this acts as the disincentive for private learning. This is one reason, among others, why technological diffusion is so low in the rural economy. This problem can be solved if the Government takes up the responsibility of technological diffusion through training and extension services.

- **Infrastructure**

  There is lack of many physical infrastructural facilities in the state. This is too well known to be repeated here. What is however, equally important or in some contexts more important is the social infrastructure. A standardized legal system, strong contract enforcement mechanism, well-defined property rights, corruption free administration etc. are a sine qua non for efficient running of the foreign trade.

nsaction cost is high because contract enforcement mechanism is still weak and property rights are not well defined in many cases. Apart from this there is no standardized legal system nor is there adequate judicial service. All these keep transaction cost high and in some cases it is so high that it renders investment infeasible. The transaction cost is not always visible but it is so important an element of total cost that its high value preempts the possibility of investment even in the line of production having high expected value. So, all efforts should be made to reduce the transaction cost in the State.

- **Quality Control**

  An effective mechanism should be evolved to control the quality of products marketed within or outside the State. Since most of the producers in the State run small-scale units, they may not be able to develop their quality control cells. In such a situation the traders and others who sell the goods to the consumers may be instructed and even trained to maintain quality.

- **Packaging and Preservation**

  Preservation is maintenance of quality. The types of products which are expected to reach the international market would require preservation. Proper packaging plays an important role in protecting and handling the products

- **Insurance**

  International market is volatile. To protect the producers and traders from the volatility-induced risk, insurance coverage may be extended to them.

- **Composite Package**

  A composite package including high-yielding varieties of seeds, seedlings, credit and insurance to cover risk should be provided to the producers. Buy- back arrangement and setting up of processing units in the long run may give boost to export potential of the State.

endowments can support the production of a high range which can, apart from meeting the local needs, satisfy a part of foreign demand. In order to transform the high potentiality into the reality, immediate steps should be taken to raise the efficiency in production through induction of new technology, better organization and institutional reform.

c Recommendations

A whole range of possibilities may be explored in order to enlarge the sets of commodities and services to be sold outside the state. Dependence on one or two sets of commodities may enhance the risk in future. Given the dynamic nature of market, the comparative advantages enjoyed by a commodity today may evaporate tomorrow with the appearance of a more successful competitor. This calls for adopting a dynamic approach to the selection of the commodities and services that can be exported from this state over the long run.

In this Report the main commodities and services in which Arunachal Pradesh has comparative advantages has been identified. These are: Horticultural and floricultural products, crops of different types of plantation, medicinal plants, off-seasons vegetables, ornamental fish, handicrafts, various offseason vegetables, and above all tourism. In case of some exportables such as off-season vegetables, tourism, etc. Arunachal Pradesh has natural advantages, ones not shared by many other states of the country.

In spite of many natural advantages, Arunachal Pradesh faces huge challenges. One of these challenges is marketing its products. To date no marketing network in the state extends beyond its borders. In the promotion of marketing four P's are of fundamental importance. These four P's are Product, Price, Packaging and Place.

i) Product

The quality of the product carries utmost importance. A qualitatively better product has the highest chance of success in the market. For maintaining quality, standardization is a necessity. A product not satisfying the standard quality must not be allowed to sell outside the state. A stringent regime for quality control is necessary. Selling a substandard product proves suicidal. Examples are Parsuram Cement, Aruntron, Nigmay Food Processing unit, etc.

ii) Price

In order to occupy a segment of market, the new entrant should charge a price at least slightly lower than the ruling market price, given that the quality of the product being launched is the same as that of the existing ones. Sometimes a new entrant has to resort to dumping, charging a price lower than the market price. The purpose is to outsell the

n the market. Once the consumersô loyalty is obtained, d, the new entrant can raise the price and earn a profit.

iii) Packaging

Packaging is a highly specialized branch of marketing. It must take into consideration the quality maintenance of the product.

iv) Place of Marketing:

While marketing the product, a step-by-step approach can be adopted. The beginning can be in Assam. Then the marketing network can be extended throughout the country depending upon the quantity and quality of the goods and services.

Development of Marketing Infrastructure

An elaborate marketing infrastructure, both physical and non-physical, is to be established. By non physical infrastructure we mean the trained manpower. First we shed light on physical infrastructure.

a) Godown facilities:

Sufficient godown facilities are necessary. However, since most of the exportables at present are perishable, so the following are necessary.

i) Cold Storage:

At present cold storage capacity is only 5000 MT which is not enough. So more cold storage facilities are to be established.

ii) Cold Chain:

The number of air-conditioned trucks must be raised in order to carry the products from the cold storage to the market.

b) Training

i) Phyto-sanitary measures

Phyto-sanitary training must be given to the farmers and those who are involved in the marketing of products. This is essential to ensure the quality and purity of the product.

er for packaging is essential. A good number of interested people may be trained in the Indian Institute of Packaging (IIP), Mumbai. IIP has branches in Delhi, Chennai, Hyderabad and Kolkata.

iii) Advertisement

A sophisticated campaign of advertisement is necessary in order to create a space in the market. For this also training of manpower is necessary.

iv) Data bank on marketing information

Tastes and preferences vary from place to place. Data may be collected about the preference of the potential customers. For example, organic products are highly demanded by the richest people in the big cities of our country. These groups of consumers do not mind paying a very high price for a quality product but the product must satisfy their tastes. For example, the average price of rice may be Rs. 20 per Kg in the market but organic rice in a super market of the big cities may fetch more than Rs. 100 per Kg. Here contact may be established with Agricultural and Processed Food Products Export Development Authority (An organization of Ministry of Commerce and Industries, Government of India).

v) Initial Linkage

Initial marketing may be done with the help of well-established companies like (Reliance Fresh, Le Marche, and Big Bazar) and in the process a brand name for the products of the state should be created. Once the brand name becomes established it would be easy to market the products of the state. For medicinal plants, liaison may be made with the well-established companies.

Appendices

Table A1

District wise Production, Consumption and Surplus of Apple in Arunachal Pradesh.

(Production, consumption and Surplus are in MT and Consumption per head is in Kg)

Tawang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	2221	2.5	97	2124
2001-02	2120	2.5	100	2020
2002-03	2184	2.5	104	2080
2003-04	2235	2.5	107	2128
2004-05	2280	2.5	111	2169
2005-06	2310	2.5	114	2196
2006-07	1860	2.5	113	1747
2007-08	2277	2.5	116	2161

West Kameng

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	5210	2.5	187	5024
2001-02	6338	2.5	192	6146
2002-03	6528	2.5	197	6331
2003-04	6868	2.5	203	6665
2004-05	7005	2.5	209	6796
2005-06	7099	2.5	214	6885
2006-07	6159	2.5	217	5942
2007-08	6752	2.5	222	6530

East Kameng

		Consumption (per head)	Total Consumption	Surplus
2000-01	106	2.5	143	-37
2001-02	-	2.5	145	-145
2002-03	-	2.5	147	-147
2003-04	-	2.5	148	-148
2004-05	-	2.5	150	-150
2005-06	-	2.5	152	-152
2006-07	-	2.5	166	-166
2007-08	25	2.5	170	-145

Papumpare

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	13	2.5	305	-292
2001-02	-	2.5	321	-321
2002-03	-	2.5	338	-338
2003-04	-	2.5	356	-356
2004-05	-	2.5	375	-375
2005-06	-	2.5	395	-395
2006-07	-	2.5	355	-355
2007-08	-	2.5	363	-363

Lower Subansiri

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	927	2.5	246	681
2001-02	130	2.5	250	-120
2002-03	134	2.5	254	-120

		2.5	258	-73
		2.5	263	-74
2005-06	191	2.5	267	-76
2006-07	141	2.5	272	-131
2007-08	593	2.5	276	317

Upper Subansiri

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	-	2.5	138	-138
2001-02	-	2.5	140	-140
2002-03	-	2.5	141	-141
2003-04	-	2.5	143	-143
2004-05	-	2.5	144	-144
2005-06	-	2.5	145	-145
2006-07		2.5	161	-161
2007-08		2.5	164	-164

West Siang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	-	2.5	260	-260
2001-02	-	2.5	264	-264
2002-03	-	2.5	267	-267
2003-04	-	2.5	271	-271
2004-05	-	2.5	275	-275
2005-06	-	2.5	279	-279
2006-07		2.5	302	-302
2007-08		2.5	309	-309

East Siang

		Consumption (per head)	Total Consumption	Surplus
2000-01	2	2.5	218	-216
2001-02	-	2.5	223	-223
2002-03	-	2.5	227	-227
2003-04	-	2.5	232	-232
2004-05	-	2.5	236	-236
2005-06	-	2.5	241	-241
2006-07	-	2.5	254	-254
2007-08	-	2.5	260	-260

Upper Siang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	3	2.5	83	-80
2001-02	-	2.5	85	-85
2002-03	-	2.5	87	-87
2003-04	-	2.5	88	-88
2004-05	-	2.5	90	-90
2005-06	-	2.5	91	-91
2006-07	-	2.5	97	-97
2007-08	-	2.5	99	-99

Dibang Valley

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	-	2.5	144	-144
2001-02	-	2.5	149	-149
2002-03	-	2.5	153	-153
2003-04		2.5	158	-158

		2.5	162	-162
		2.5	167	-167
2006-07		2.5	211	-211
2007-08		2.5	216	-216

Lohit

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	-	2.5	359	-359
2001-02	-	2.5	369	-369
2002-03	-	2.5	379	-379
2003-04	-	2.5	389	-389
2004-05	-	2.5	400	-400
2005-06	-	2.5	410	-410
2006-07	-	2.5	363	-363
2007-08	17	2.5	372	-355

Changlang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	31	2.5	314	-283
2001-02	-	2.5	318	-318
2002-03	-	2.5	322	-322
2003-04	-	2.5	326	-326
2004-05	-	2.5	331	-331
2005-06	-	2.5	335	-335
2006-07	-	2.5	364	-364
2007-08	23	2.5	373	-350

Tirap

		Consumption (per head)	Total Consumption	Surplus
2000-01	-	2.5	251	-251
2001-02	-	2.5	255	-255
2002-03	-	2.5	259	-259
2003-04	-	2.5	263	-263
2004-05	-	2.5	267	-267
2005-06	-	2.5	272	-272
2006-07	-	2.5	292	-292
2007-08	-	2.5	299	-299

Source: Statistical Abstract of Arunachal Pradesh, Directorate of Economics and Statistics, Government of Arunachal Pradesh, Itanagar, different years.

Table - A 2

District-wise Production, Consumption and Surplus of Citrus in Arunachal Pradesh

(Production, Consumption, Surplus are in MT

& Consumption per head is in kg)

Tawang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001-02	16	7.2	289	-273
2002-03	17	7.2	299	-282
2003-04	18	7.2	308	-290
2004-05	19	7.2	318	-299
2005-06	19	7.2	329	-310

West Kameng

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001-02	17	7.2	552	-535
2002-03	18	7.2	568	-550
2003-04	19	7.2	584	-565
2004-05	20	7.2	601	-581
2005-06	22	7.2	618	-596

East Kameng

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001-02	70	7.2	417	-347
2002-03	74	7.2	422	-348
2003-04	77	7.2	428	-351
2004-05	79	7.2	433	-354

		7.2	439	-355

Papumpare

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001-02	79	7.2	925	-846
2002-03	83	7.2	974	-891
2003-04	87	7.2	1026	-939
2004-05	89	7.2	1080	-991
2005-06	91	7.2	1137	-1046

Upper Siang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001-02	3625	7.2	245	3380
2002-03	3806	7.2	249	3557
2003-04	3996	7.2	254	3742
2004-05	4076	7.2	258	3818
2005-06	4157	7.2	263	3894

Dibang Valley

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001-02	416	7.2	428	-12
2002-03	437	7.2	441	-4
2003-04	114	7.2	454	-340
2004-05	117	7.2	467	-350
2005-06	119	7.2	481	-362

Lohit

		Consumption (per head)	Total Consumption	Surplus
2001-02	495	7.2	1062	-567
2002-03	520	7.2	1090	-570
2003-04	548	7.2	1120	-572
2004-05	559	7.2	1151	-592
2005-06	570	7.2	1182	-612

Changlang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001-02	270	7.2	915	-645
2002-03	283	7.2	928	-645
2003-04	297	7.2	940	-643
2004-05	303	7.2	953	-650
2005-06	309	7.2	966	-657

Tirap

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001-02	272	7.2	734	-462
2002-03	283	7.2	746	-463
2003-04	300	7.2	758	-458
2004-05	306	7.2	770	-464
2005-06	312	7.2	782	-470

Source: Statistical Abstract of Arunachal Pradesh, Directorate of Economics and Statistics, Government of Arunachal Pradesh, Itanagar; different years.

Table A 3

and Surplus of Banana in Arunachal Pradesh

(Production, Consumption and Surplus are in MT, Consumption per head is in Kg)

Tawang

year	Total Production	Consumption (per head) in Kg	Total Consumption	Surplus
2000-01	-	3.9	152	-152
2001-02	-	3.9	157	-157
2002-03	3	3.9	162	-159
2003-04	3	3.9	167	-164
2004-05	3	3.9	172	-169
2005-06	4	3.9	178	-174

West Kameng

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	63	3.9	291	-228
2001-02	63	3.9	299	-236
2002-03	76	3.9	308	-232
2003-04	80	3.9	316	-236
2004-05	82	3.9	325	-243
2005-06	84	3.9	335	-251

East Kameng

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	103	3.9	223	-120
2001-02	104	3.9	226	-122
2002-03	105	3.9	229	-124
2003-04	210	3.9	232	-22

		3.9	235	-20
		3.9	238	-19

Papumpare

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	-	-	-	-
2001-02	193	3.9	501	-308
2002-03	200	3.9	528	-328
2003-04	340	3.9	556	-216
2004-05	347	3.9	585	-238
2005-06	354	3.9	616	-262

Lower Subansiri

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	730	3.9	383	347
2001-02	620	3.9	390	230
2002-03	645	3.9	396	249
2003-04	677	3.9	403	274
2004-05	691	3.9	410	281
2005-06	705	3.9	416	289

Upper Subansiri

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	192	3.9	216	-24
2001-02	1035	3.9	218	817
2002-03	1067	3.9	220	847
2003-04	1130	3.9	222	908
2004-05	1148	3.9	225	923
2005-06	1171	3.9	227	944

West Siang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	2054	3.9	405	1649
2001-02	1298	3.9	411	887
2002-03	1350	3.9	417	933
2003-04	1417	3.9	423	994
2004-05	1146	3.9	429	717
2005-06	1475	3.9	436	1039

East Siang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	1153	3.9	341	812
2001-02	3820	3.9	348	3472
2002-03	3773	3.9	354	3419
2003-04	3961	3.9	361	3600
2004-05	4041	3.9	369	3672
2005-06	4121	3.9	376	3745

Upper Siang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	768	3.9	130	638
2001-02	2060	3.9	133	1927
2002-03	2142	3.9	135	2007
2003-04	2219	3.9	137	2082
2004-05	2264	3.9	140	2124
2005-06	2309	3.9	143	2166

Dibang Valley

		Consumption (per head)	Total Consumption	Surplus
2000-01	896	3.9	225	671
2001-02	776	3.9	232	544
2002-03	807	3.9	239	568
2003-04	344	3.9	246	98
2004-05	351	3.9	253	98
2005-06	358	3.9	261	97

Lohit

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	1285	3.9	560	725
2001-02	1144	3.9	575	569
2002-03	1190	3.9	591	599
2003-04	1249	3.9	607	642
2004-05	1274	3.9	623	651
2005-06	1300	3.9	640	660

Changlang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	1140	3.9	489	651
2001-02	1158	3.9	496	662
2002-03	1204	3.9	502	702
2003-04	1264	3.9	509	755
2004-05	1290	3.9	516	774
2005-06	1315	3.9	523	792

Tirap

		Consumption (per head)	Total Consumption	Surplus
2000-01	3791	3.9	391	3400
2001-02	905	3.9	398	507
2002-03	941	3.9	404	537
2003-04	988	3.9	410	578
2004-05	1008	3.9	417	591
2005-06	1028	3.9	4240	604

Source: Statistical Abstract of Arunachal Pradesh, Directorate of Economics and Statistics Government of Arunachal Pradesh, Itanagar; different years.

Table A 4

and Surplus of Ginger in Arunachal Pradesh

(Production, Consumption and Surplus are in Kg)

Tawang

year	Total Production	Consumption (per head) in Kg	Total Consumption	Surplus
2000-01	48000	9.8	381000	-333000
2001-02	53000	9.8	394000	-341000
2002-03	56000	9.8	407000	-351000
2003-04	59000	9.8	420000	-361000
2004-05	61000	9.8	433000	-372000
2005-06	62000	9.8	447000	-385000

West Kameng

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	121000	9.8	731000	-610000
2001-02	134000	9.8	752000	-618000
2002-03	142000	9.8	773000	-631000
2003-04	149000	9.8	795000	-646000
2004-05	152000	9.8	817000	-665000
2005-06	155000	9.8	841000	-686000

East Kameng

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	145000	9.8	560000	-415000
2001-02	164000	9.8	567000	-403000
2002-03	175000	9.8	575000	-400000
2003-04	181000	9.8	582000	-401000
2004-05	185000	9.8	589000	-404000
2005-06	189000	9.8	597000	-408000

Papumpare

		Consumption (per head)	Total Consumption	Surplus
2000-01	242000	9.8	1196000	-954000
2001-02	161000	9.8	1259000	-1098000
2002-03	170000	9.8	1326000	-1156000
2003-04	178000	9.8	1396000	-1218000
2004-05	182000	9.8	1470000	-1288000
2005-06	187000	9.8	1548000	-1361000

Lower Subansiri

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	190000	9.8	963000	-773000
2001-02	211000	9.8	979000	-768000
2002-03	224000	9.8	995000	-772000
2003-04	235000	9.8	1012000	-777000
2004-05	240000	9.8	1029000	-789000
2005-06	245000	9.8	1046000	-801000

Upper Subansiri

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	145000	9.8	542000	-397000
2001-02	269000	9.8	548000	-279000
2002-03	285000	9.8	553000	-268000
2003-04	215000	9.8	559000	-344000
2004-05	220000	9.8	565000	-345000
2005-06	224000	9.8	570000	-346000

West Siang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	242000	9.8	1018000	-776000
2001-02	4267000	9.8	1033000	3234000
2002-03	4541000	9.8	1048000	3493000
2003-04	4768000	9.8	1064000	3704000
2004-05	4864000	9.8	1079000	3785000
2005-06	4961000	9.8	1095000	3866000

East Siang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	5323000	9.8	856000	4467000
2001-02	3537000	9.8	873000	2664000
2002-03	3839000	9.8	891000	2948000
2003-04	4030000	9.8	908000	3122000
2004-05	4111000	9.8	926000	3185000
2005-06	4193000	9.8	945000	3248000

Upper Siang

		onsumption (per head)	Total Consumption	Surplus
2000-01	269000	9.8	333000	-64000
2001-02	284000	9.8	339000	-55000
2002-03	298000	9.8	345000	-47000
2003-04	304000	9.8	352000	-48000
2004-05	310000	9.8	358000	-48000

Dibang Valley

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	483000	9.8	566000	-83000
2001-02	16664000	9.8	582000	16082000
2002-03	17581000	9.8	600000	16981000
2003-04	1855000	9.8	618000	1237000
2004-05	1893000	9.8	636000	1257000
2005-06	1931000	9.8	655000	1276000

Lohit

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	3840000	9.8	1407000	2433000
2001-02	5915000	9.8	1445000	4470000
2002-03	6252000	9.8	1484000	4768000
2003-04	6564000	9.8	1525000	5039000
2004-05	6689000	9.8	1566000	5123000
2005-06	6822000	9.8	1609000	5213000

Changlang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	97000	9.8	1229000	-1132000
2001-02	108000	9.8	1246000	-1138000

		9.8	1262000	-1148000
		9.8	1280000	-1161000
2004-05	122000	9.8	1297000	-1175000
2005-06	124000	9.8	1314000	-1190000

Tirap

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2000-01	-	-	-	-
2001-02	537000	9.8	999000	-462000
2002-03	568000	9.8	1015000	-447000
2003-04	596000	9.8	1031000	-435000
2004-05	608000	9.8	1048000	-440000
2005-06	620000	9.8	1065000	-445000

Source: i. Statistical Abstract of Arunachal Pradesh, Directorate of Economics and Statistics, Government of Arunachal Pradesh, Itanagar; different years.

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