Working Paper No. CDS/07/2020

Identification of the Potential Exportables of Arunachal Pradesh

Nirod Chandra Roy
Sushanta Kumar Nayak
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Department of Economics
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PREFACE

The Centre for Development Studies (CDS) was set up as a research adjunct at the Department of Economics, Rajiv Gandhi University (RGU), Itanagar, Arunachal Pradesh, with a generous grant from the Ministry of Finance (Department of Economic Affairs), Government of India. The objectives of the Centre include the creation of high-quality research infrastructure for students and researchers and faculty members, in addition to sponsoring and coordinating research on various developmental issues having policy implications both at the regional and national level. Publishing working/policy papers on the research outcome of the Centre, monographs and edited volumes are the key activities of the Centre. The present working paper jointly authored by Prof. N.C. Roy, Prof. S.K. Nayak and Dr. D.B. Gurung, titled, '*Identification of the Potential Exportables of Arunachal Pradesh*', is the outcome of a researchproject.It is the *seventh* in the series of working paper being published by the Centre for Development Studies.

The working paper is a study on the export potentials of the state of Arunachal Pradesh. It emphasises on the fact that the resource endowments in the State are adequate for the expansion of outputs of a good range of commodities. There is a variety of horticultural products and indigenous orchids which can be produced commercially by overcoming the various challenges which the State faces in terms of infrastructural bottlenecks. However, the authors argue, that for this economic vision to be a reality, it is imperative that the producers get remunerative prices for their outputs.

This working paper, focusing on the export potential of the State, will be of immense interest and use to policy planners, academics, researchers and scholars. I congratulate the authors for the excellent time bound work.

Date: June, 2020

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ACKNOWLEDGEMENTS

At the very onset, we would like to thank the Centre for Development Studies (CDS), Department of Economics, Rajiv Gandhi University (RGU), Rono Hills for accepting our research study and deciding to publish it as a working paper of the CDS. We are thankful to Prof. Saket Kushwaha, Vice Chancellor of Rajiv Gandhi University for his support and encouragement to the CDS and the Department of Economics. Special thanks are due to Prof. Vandana Upadhyay, Coordinator, Centre for Development Studies for taking the initiative to publish this study as a working paper.

The paper is based on the Report "Export Potential in Arunachal Pradesh" submitted to Government of Arunachal Pradesh prepared by Prof. N.C. Roy and Prof. S.K. Nayak and assisted by Dil Bahadur Gurung of the Department of Economics in 2008. We are thankful to the Department of Trade and Commerce, Government of Arunachal Pradesh, for providing financial assistance without which the study would not have been possible. We sincerely thank the Director, Shri Tokong Pertin, Department of Trade and Commerce, Government of Arunachal Pradesh for his active support throughout the study.

We are also thankful to Prof. Tamo Mibang, the ex-Vice-Chancellor of Rajiv Gandhi University for his guidance and support during the study. We also acknowledge the help rendered to the project work by Shri Rajesh Puthoor and Shri Vijay Prasad. Our sincere thanks also go to those who have provided information on the production profile of different commodities in Arunachal Pradesh. We are hopeful that the report in the working paper form would help the researchers engaged in the study of Arunachal economy.

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SUMMARY

Foreign trade has been an inseparable companion of development. Being insular and being less developed are synonymous. That all the 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 – and are still suffering – 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 State's 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.

The resource endowments are adequate enough in the state for expansion of outputs of a good range of commodities but 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.
- Packaging and preservation are inseparable elements of marketing. In order to maintain good quality, preservation 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.

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CHAPTER 1
INTRODUCTION

1.1 An Overview

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 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 society's 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.

1.2 Arunachal Economy

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.

(iv) High inter-tribal transaction cost

The institutions guiding production 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 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 looking at the other side, the high cost of inter-tribal transactions might have resulted in their frequency being small.

1.3 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.

1.4 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 comparative picture of the Arunachal economy for the 1950s and 1960s. However, from 1970-71 to 1990-91 the Arunachal economy performed very well.

In 1970-71 Arunachal per capita income was just 56 per cent 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 the rest of the country. At the end of the 1970s Arunachal's per capita income rose to be around 75 per cent 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. During 2017-18 the per capita income (NSDP) of the State is Rs. 90727 as per the estimate of Central Statistical Organisation, New Delhi. In short the basic thrust of the Arunachal economy can be characterized by its persistent movement towards expansion and growth.

1.5 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.

1.6 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 foreign market appears to be a necessary step to raise the scale of output of many products in the State.

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

2.1 Introduction

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, occupational 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 per cent of the NSDP, the highest among the three major sectors of the economy. The remaining 25 per cent 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 per cent 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 per cent. 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 share in NSDP has shrunken. This is

deindustrialization, an affliction which the State has suffered much before the modern industrialization 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 – 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.

2.2 Export and Industrialization

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 per cent 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 much on the demand from non-tertiary sectors. The tertiary sector has grown rather autonomously and this autonomous 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 processes 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 farmers' not getting the remunerative prices for their products. It is frequently seen in the post-harvest period in 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.

Table 1.1: State level Relationship between Export, Industrialization and per capita income

(Export in US Dollar and per capita income in Rs)

State	Export in US million $ (2013-14)	Share of Indian Export (2013-14)	Growth Rate of Export (2013-14) (%)	Per Capita income (2014-15)	Population (2011 census)	Share of Industry (in %) in NSDP (2014-15)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Maharashtra	71661	22.9	7.9	134081	112,374,333	29.52
Gujarat	73498	23.5	19.7	124678	60,439,692	38.58
Tamil Nadu	26937	8.6	-0.7	130197	72,147,030	28.21
Karnataka	17821	5.7	1.7	132880	61,095,297	21.24
Andhra Pradesh	15353	4.9	7.3	93699	49,577,103	21.92
Delhi	9329	3.0	8.8	249004	16,787,941	11.86
West Bengal	10496	3.4	11.3	78903	91,276,115	NA
Haryana	10657	3.4	9.2	148485	25,351,462	27.48
Uttar Pradesh	13309	4.3	21.6	43861	199,812,341	23.72
Rajasthan	5915	1.9	-15.2	76881	68,548,437	27.61
Kerala	4285	1.4	-55.1	139195	33,406,061	24.19
Punjab	7063	2.3	8.8	114561	27,743,338	20.66
Madhya Pradesh	4374	1.4	4.6	56182	72,626,809	21.45
Odisha	4005	1.3	25.4	64869	41,974,218	31.59
India	312610	100	4.1	86454	1210569573	25.72

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

2) Per capita income (NSDP) is for 2014-15.

Sources: *Economic Survey Various Years Government of India and Handbook of Statistics of Indian Economy by Reserve Bank of India. Only those States are considered whose export constitutes at least 1% of Indian export.*

It will be illuminating at this point to have a glimpse of the effect of industrialization on export. Table 1.1 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 – almost one third of its income comes from the industry – and

Gujarat has the highest export per head among the States and Union Territories. Even Delhi's export appears dwarfed compared with Gujarat's and this is because Delhi is dominated by the service sector, not by the industrial sector: only 10 per cent 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.

CHAPTER 3
DETERMINATION OF EXPORT POTENTIAL

3.1 Introduction

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 'vent' for 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 period's low price there is 'deficit' in the current period which tends to raise the current year's price. Based on this high price if the production for the next period is planned then there appears a 'surplus'.

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.

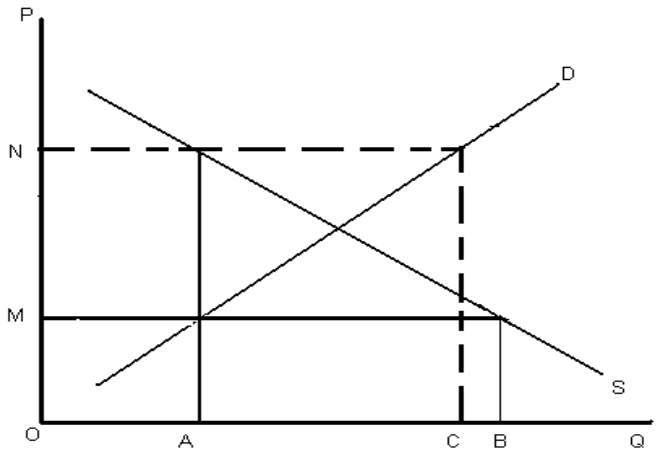

Figure 3.1: Price Behaviour and Surplus

It is assumed that the expectation is static and there is a lag of one period between the investment and realization of output. 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 year's 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 AC. 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 country's 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.

International market is highly competitive. A gainful participation in a competitive market requires timely upgradation of 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 the surplus generated in the state.

3.2 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 2009. 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 per cent 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 present generation if these trees are cut and their one time value is realized it may have serious consequences for the future 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.

3.3 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.

3.4 Major Exportables

(i) Apple

Concentrated mainly in the two districts, Tawang and West Kameng, apple production in the State amounted to thirty two thousand metric tonnes in the year 2015. 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 per cent 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.

Table 3.1: Production of Apple in Arunachal Pradesh

(*Production in MT)*

Year	Production
(1)	(2)
2001	8508
2002	8588
2003	8846
2004	9288
2005	9474
2006	9600
2007	8160
2008	9790
2009	9986

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

Arunachal Pradesh lags behind in apple production because of largely historical and geographical reasons. Apple was introduced 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 3.1 shows the growth of apple production in the state.

(ii) Orange

Agro-climatic conditions in 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 in 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. Table 3.2 shows the trend of orange output in the State during 2002-09. 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
(1)	(2)
2002	24041
2003	25296
2004	19300
2005	26747
2006	27283
2007	24132
2008	37780
2009	39667

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

(iii) Banana

Though the origin of banana 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 20 thousand tonnes during 2015.

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
(1)	**(2)**
2001	11383
2002	12354
2003	12981
2004	13087
2005	13045
2006	13603
2007	10150
2008	13553
2009	15598

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

(iv) 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 the temperature in the winter falls drastically. The State is a good producer of pineapple. Table 3.4 shows the pineapple production during various years.

Table 3.4: Production of Pineapple in Arunachal Pradesh

(*Production in MT*)

Year	Production
(1)	**(2)**
2002	31387
2003	33900
2004	33978
2005	34657
2006	35354
2007	30343
2008	32050
2009	33436

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

Table 3.4 shows a healthy growth of output of pineapple in the State in recent years. 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.

(v) 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 3.5 shows the ginger output in the State during 2002-2009. 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 years 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: Production of Ginger in Arunachal Pradesh

(*Production in MT*)

Year	Production
(1)	**(2)**
2002	32259
2003	33819
2004	19247
2005	19631
2006	20023
2007	-
2008	37908
2009	2282

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

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 paddy. 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.

3.5 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 Netherlands. In the course of just six years Mizoram emerged as the largest producer of these flowers in the country. The quality 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.

3.6 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.

3.7 Tourism

Apart from goods, the state has the vast possibility of offering a unique service – 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.

3.8 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 force 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.

4.1 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.

- **Market Network**

Network of market should be promoted through non-governmental agencies with proper regulatory system or directly by the Government. It is possible only through developing the growers' co-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.

- **Reduction of transaction cost**

In Arunachal Pradesh the transaction 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.

In fine, Arunachal's resource endowments can support the production of a high range of goods and services in quantities 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.

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
2001	2221	2.5	97	2124
2002	2120	2.5	100	2020
2003	2184	2.5	104	2080
2004	2235	2.5	107	2128
2005	2280	2.5	111	2169
2006	2310	2.5	114	2196

West Kameng

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	5210	2.5	187	5024
2002	6338	2.5	192	6146
2003	6528	2.5	197	6331
2004	6868	2.5	203	6665
2005	7005	2.5	209	6796
2006	7099	2.5	214	6885

East Kameng

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	106	2.5	143	-37
2002	-	2.5	145	-145
2003	-	2.5	147	-147
2004	-	2.5	148	-148
2005	-	2.5	150	-150
2006	-	2.5	152	-152

Papumpare

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	13	2.5	305	-292
2002	-	2.5	321	-321
2003	-	2.5	338	-338
2004	-	2.5	356	-356
2005	-	2.5	375	-375
2006	-	2.5	395	-395

Lower Subansiri

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	927	2.5	246	681
2002	130	2.5	250	-120
2003	134	2.5	254	-120
2004	185	2.5	258	-73
2005	189	2.5	263	-74
2006	191	2.5	267	-76

Upper Subansiri

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	-	2.5	138	-138
2002	-	2.5	140	-140
2003	-	2.5	141	-141
2004	-	2.5	143	-143
2005	-	2.5	144	-144
2006	-	2.5	145	-145

West Siang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	-	2.5	260	-260
2002	-	2.5	264	-264
2003	-	2.5	267	-267
2004	-	2.5	271	-271
2005	-	2.5	275	-275
2006	-	2.5	279	-279

East Siang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	2	2.5	218	-216
2002	-	2.5	223	-223
2003	-	2.5	227	-227
2004	-	2.5	232	-232
2005	-	2.5	236	-236
2006	-	2.5	241	-241

Upper Siang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	3	2.5	83	-80
2002	-	2.5	85	-85
2003	-	2.5	87	-87
2004	-	2.5	88	-88
2005	-	2.5	90	-90
2006	-	2.5	91	-91

Dibang Valley

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	-	2.5	144	-144
2002	-	2.5	149	-149
2003	-	2.5	153	-153
2004		2.5	158	-158
2005	-	2.5	162	-162
2006	-	2.5	167	-167

Lohit

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	-	2.5	359	-359
2002	-	2.5	369	-369
2003	-	2.5	379	-379
2004	-	2.5	389	-389
2005	-	2.5	400	-400
2006	-	2.5	410	-410

Changlang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	31	2.5	314	-283
2002	-	2.5	318	-318
2003	-	2.5	322	-322
2004	-	2.5	326	-326
2005	-	2.5	331	-331
2006	-	2.5	335	-335

Tirap

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	-	2.5	251	-251
2002	-	2.5	255	-255
2003	-	2.5	259	-259
2004	-	2.5	263	-263
2005	-	2.5	267	-267
2006	-	2.5	272	-272

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
2002	16	7.2	289	-273
2003	17	7.2	299	-282
2004	18	7.2	308	-290
2005	19	7.2	318	-299
2006	19	7.2	329	-310

West Kameng

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2002	17	7.2	552	-535
2003	18	7.2	568	-550
2004	19	7.2	584	-565
2005	20	7.2	601	-581
2006	22	7.2	618	-596

East Kameng

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2002	70	7.2	417	-347
2003	74	7.2	422	-348
2004	77	7.2	428	-351
2005	79	7.2	433	-354
2006	84	7.2	439	-355

Papumpare

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2002	79	7.2	925	-846
2003	83	7.2	974	-891
2004	87	7.2	1026	-939
2005	89	7.2	1080	-991
2006	91	7.2	1137	-1046

Upper Siang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2002	3625	7.2	245	3380
2003	3806	7.2	249	3557
2004	3996	7.2	254	3742
2005	4076	7.2	258	3818
2006	4157	7.2	263	3894

Dibang Valley

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2002	416	7.2	428	-12
2003	437	7.2	441	-4
2004	114	7.2	454	-340
2005	117	7.2	467	-350
2006	119	7.2	481	-362

Lohit

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2002	495	7.2	1062	-567
2003	520	7.2	1090	-570
2004	548	7.2	1120	-572
2005	559	7.2	1151	-592
2006	570	7.2	1182	-612

Changlang

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2002	270	7.2	915	-645
2003	283	7.2	928	-645
2004	297	7.2	940	-643
2005	303	7.2	953	-650
2006	309	7.2	966	-657

Tirap

Year	Total Production	Consumption (per head)	Total Consumption	Surplus
2002	272	7.2	734	-462
2003	283	7.2	746	-463
2004	300	7.2	758	-458
2005	306	7.2	770	-464
2006	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: District wise Production, Consumption 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
2001	-	3.9	152	-152
2002	-	3.9	157	-157
2003	3	3.9	162	-159
2004	3	3.9	167	-164
2005	3	3.9	172	-169
2006	4	3.9	178	-174

West Kameng

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	63	3.9	291	-228
2002	63	3.9	299	-236
2003	76	3.9	308	-232
2004	80	3.9	316	-236
2005	82	3.9	325	-243
2006	84	3.9	335	-251

East Kameng

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	103	3.9	223	-120
2002	104	3.9	226	-122
2003	105	3.9	229	-124
2004	210	3.9	232	-22
2005	215	3.9	235	-20
2006	219	3.9	238	-19

Papumpare

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	-	-	-	-
2002	193	3.9	501	-308
2003	200	3.9	528	-328
2004	340	3.9	556	-216
2005	347	3.9	585	-238
2006	354	3.9	616	-262

Lower Subansiri

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	730	3.9	383	347
2002	620	3.9	390	230
2003	645	3.9	396	249
2004	677	3.9	403	274
2005	691	3.9	410	281
2006	705	3.9	416	289

Upper Subansiri

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	192	3.9	216	-24
2002	1035	3.9	218	817
2003	1067	3.9	220	847
2004	1130	3.9	222	908
2005	1148	3.9	225	923
2006	1171	3.9	227	944

West Siang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	2054	3.9	405	1649
2002	1298	3.9	411	887
2003	1350	3.9	417	933
2004	1417	3.9	423	994
2005	1146	3.9	429	717
2006	1475	3.9	436	1039

East Siang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	1153	3.9	341	812
2002	3820	3.9	348	3472
2003	3773	3.9	354	3419
2004	3961	3.9	361	3600
2005	4041	3.9	369	3672
2006	4121	3.9	376	3745

Upper Siang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	768	3.9	130	638
2002	2060	3.9	133	1927
2003	2142	3.9	135	2007
2004	2219	3.9	137	2082
2005	2264	3.9	140	2124
2006	2309	3.9	143	2166

Dibang Valley

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	896	3.9	225	671
2002	776	3.9	232	544
2003	807	3.9	239	568
2004	344	3.9	246	98
2005	351	3.9	253	98
2006	358	3.9	261	97

Lohit

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	1285	3.9	560	725
2002	1144	3.9	575	569
2003	1190	3.9	591	599
2004	1249	3.9	607	642
2005	1274	3.9	623	651
2006	1300	3.9	640	660

Changlang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	1140	3.9	489	651
2002	1158	3.9	496	662
2003	1204	3.9	502	702
2004	1264	3.9	509	755
2005	1290	3.9	516	774
2006	1315	3.9	523	792

Tirap

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	-	-	-	-
2002	905	3.9	398	507
2003	941	3.9	404	537
2004	988	3.9	410	578
2005	1008	3.9	417	591
2006	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: District wise Production, Consumption 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
2001	48000	9.8	381000	-333000
2002	53000	9.8	394000	-341000
2003	56000	9.8	407000	-351000
2004	59000	9.8	420000	-361000
2005	61000	9.8	433000	-372000
2006	62000	9.8	447000	-385000

West Kameng

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	121000	9.8	731000	-610000
2002	134000	9.8	752000	-618000
2003	142000	9.8	773000	-631000
2004	149000	9.8	795000	-646000
2005	152000	9.8	817000	-665000
2006	155000	9.8	841000	-686000

East Kameng

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	145000	9.8	560000	-415000
2002	164000	9.8	567000	-403000
2003	175000	9.8	575000	-400000
2004	181000	9.8	582000	-401000
2005	185000	9.8	589000	-404000
2006	189000	9.8	597000	-408000

Papumpare

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	242000	9.8	1196000	-954000
2002	161000	9.8	1259000	-1098000
2003	170000	9.8	1326000	-1156000
2004	178000	9.8	1396000	-1218000
2005	182000	9.8	1470000	-1288000
2006	187000	9.8	1548000	-1361000

Lower Subansiri

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	190000	9.8	963000	-773000
2002	211000	9.8	979000	-768000
2003	224000	9.8	995000	-772000
2004	235000	9.8	1012000	-777000
2005	240000	9.8	1029000	-789000
2006	245000	9.8	1046000	-801000

Upper Subansiri

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	145000	9.8	542000	-397000
2002	269000	9.8	548000	-279000
2003	285000	9.8	553000	-268000
2004	215000	9.8	559000	-344000
2005	220000	9.8	565000	-345000
2006	224000	9.8	570000	-346000

West Siang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	242000	9.8	1018000	-776000
2002	4267000	9.8	1033000	3234000
2003	4541000	9.8	1048000	3493000
2004	4768000	9.8	1064000	3704000
2005	4864000	9.8	1079000	3785000
2006	4961000	9.8	1095000	3866000

East Siang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	5323000	9.8	856000	4467000
2002	3537000	9.8	873000	2664000
2003	3839000	9.8	891000	2948000
2004	4030000	9.8	908000	3122000
2005	4111000	9.8	926000	3185000
2006	4193000	9.8	945000	3248000

Upper Siang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2002	269000	9.8	333000	-64000
2003	284000	9.8	339000	-55000
2004	298000	9.8	345000	-47000
2005	304000	9.8	352000	-48000
2006	310000	9.8	358000	-48000

Dibang Valley

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	483000	9.8	566000	-83000
2002	16664000	9.8	582000	16082000
2003	17581000	9.8	600000	16981000
2004	1855000	9.8	618000	1237000
2005	1893000	9.8	636000	1257000
2006	1931000	9.8	655000	1276000

Lohit

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	3840000	9.8	1407000	2433000
2002	5915000	9.8	1445000	4470000
2003	6252000	9.8	1484000	4768000
2004	6564000	9.8	1525000	5039000
2005	6689000	9.8	1566000	5123000
2006	6822000	9.8	1609000	5213000

Changlang

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	97000	9.8	1229000	-1132000
2002	108000	9.8	1246000	-1138000
2003	114000	9.8	1262000	-1148000
2004	119000	9.8	1280000	-1161000
2005	122000	9.8	1297000	-1175000
2006	124000	9.8	1314000	-1190000

Tirap

year	Total Production	Consumption (per head)	Total Consumption	Surplus
2001	-	-	-	-
2002	537000	9.8	999000	-462000
2003	568000	9.8	1015000	-447000
2004	596000	9.8	1031000	-435000
2005	608000	9.8	1048000	-440000
2006	620000	9.8	1065000	-445000

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

Table B 1: Production of Apple in Arunachal Pradesh

(Production in MT)

Year	Production
(1)	**(2)**
2010	13388
2011	-
2012	30505
2013	30945
2014	31873
2015	32000

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

Table B 2: Production of Orange in Arunachal Pradesh

(Production in MT)

Year	Total Production
(1)	**(2)**
2010	41621*
2011	-
2012	175707
2013	175707
2014	182100
2015	190000

Note: * Figures are taken from NEDfi data bank

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

Table B 3: Production of Banana in Arunachal Pradesh

(Production in MT)

Year	Total Production
(1)	**(2)**
2010	22705
2011	-
2012	17466
2013	18186
2014	19095
2015	20095

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

Table B 4: Pine Apple output in Arunachal Pradesh

(Production in MT)

Year	Production
(1)	**(2)**
2010	55292
2011	-
2012	66780
2013	67580
2014	69607
2015	70543

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

Table B 5: Production of Ginger in Arunachal Pradesh

(Production in MT)

Year	Production
(1)	**(2)**
2009	2282
2010	3000*
2011	3000*
2012	12250
2013	9130
2014	12617
2015	12800

Note: * Figures are taken from NEDfi data bank

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

Note: The data released by the Government of Arunachal Pradesh for the period 2012-15 appear too high to be consistent with the previous level of production. For example in 2010, production of Apple was 13388 metric tonnes but in 2012 the output shows a jump to 30505 metric tonnes. Again in case of the output of Orange also, during 2010 it was 42000 metric tonnes, which further increased to 175707 metric tonnes in 2012. The output of the Pineapple also shows the same trends. A sudden rise in the output over a year does not appear to be plausible.

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