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EXPLORING THE REASON OF INEFFECTIVENESS OF INDIA'S POLICY FOR BIODIVERSITY CONSERVATION AND POLLUTION CONTROL IN THE NORTHEAST REGION

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ABSTRACT

Himalayan mountains have always been a rich source of natural resources and biodiversity, which can be exploited for sustainable development of the splendid hills and mountains but the pollution pose a serious threat to biodiversity. Looking for sustainable alternatives is the need of the hour. Undoubtedly, Bamboo, being the fast growing natural raw material with diverse uses can be a better alternative. In the field of construction, it has been considered as strong as steel. Being an environmental friendly, widely available as a substitute material for diverse uses, it is a perfect substitute for traditional wood timber which is crucial for biodiversity conservation and pollution control. The paper brings out the overview of the government initiatives through Bamboo technology applications with a focus on sustainable development of India's northeast region and also explores the reasons for its ineffectiveness. The paper critically analyses the impact of Technology Development Assistance (TDA) scheme of National Mission on Bamboo Application (NMBA) under the Ministry of Science and Technology and invested more than Rs. 70 crore as Technology Development Assistance (TDA) to 84 Bamboo industry units in North East India. But most of the industries supported collapsed within a year. Interpretive structural modeling of the scheme through Total Interpretive Structural Modeling technique shows that the unavailability of raw material is driver factor which led to the shutdown of bamboo application units. The findings provide policy lessons for strategy execution excellence of future plans and policies.

KEY WORDS : Biodiversity conservation, Pollution control, India

INTRODUCTION

Bamboo has been integral to the lives of billion populations from 'cradle to grave'. About a quarter of the present global population depends on Bamboo in one way or the other. India is the second largest producer of bamboo after China. In India, approximately 148 species of bamboos are found (both wild and cultivated). After the northeast region, the Western Ghats have the second largest stock and diversity of bamboos in India. India has a large Bamboo resource with 11,361 thousand hectares (Maxim Lobovikov *et al*., 2005) while its global market share is only ~4 percent (Sharma, 2008). India's northeast region has always been a rich source of natural resources and biodiversity, which can be exploited for addressing environmental issues and sustainable development of the splendid hills and mountains.India's northeast region has always been a rich source of natural resources and biodiversity, which can be exploited for addressing environmental issues and sustainable development of the splendid hills and mountains.

Realising the fact that Bamboo based industry has vast potential for generating income and employment as well as addressing the environmental sustainability issues in the northeast region, the Government of India launched two missions dedicated to Bamboo. Two bamboo missions were started in 2002, National Bamboo Mission (NBM) was launched under the Ministry of Agriculture (Government of India) with the objective to accelerate the bamboo cultivation and sericulture while National Mission on Bamboo

Application (NMBA) was launched under the Ministry of Science and Technology (Government of India) for technology application and business strategy execution. With the aim to establish and nurture the bamboo industry in the northeast region, National Bamboo Mission (NBM) and National Mission on Bamboo Application (NMBA) introduced several schemes for bamboo plantation, propagation and technology application in the region. The scheme was successful initially as it led to the rise of plantation and production at an initial stage. Many industrial units were established in all the eight states of the region which gave livelihood to many families. But after two three successful years, it gradually started declining and ultimately led to the collapse of the overall sector in the region. Most of the industrial units were forced to shutdowndue to financial crisis.

Now when the Government of India has come up with the restructured bamboo mission, it is high time to revisit the previous experiences to explore the factors which led to the ineffectiveness of the policy and schemes in the northeast. The present study aims to assess the reasons for its ineffectiveness in order to trap the strategy execution failures by using the Total Interpretive Structural Modeling technique. Total Interpretive Structural Model (TISM) technique has been applied to find out the relationship among the different factors. Total interpretive structural modeling (TISM) is a modified method of Interpretive Structural modeling (ISM) technique (Warfield, 1974) which gives a graphical representation of intricate and complex relations of interrelated factors. (Sushil, 2005a, 2005b, 2012a, 2012b) (Nasim, 2011) (Sushil and Gerhard, 2015) The relationships portrayed by a digraph model gives a graphical model (Sage, 1977) representing the hierarchy and interrelations with each other in some way or the other (Farris and Sage, 1975). TISM was later upgraded and modified as TISM-P to introduce polarity in relationships for a better understanding of the positive and negative impact of the factors. (Sushil, 2017, 2018)

The review of secondary data available in the public domain will be examined to check the core competencies of the Indian bamboo sector. By and large, it will also explore the factors of strategy implementation with reference to bamboo industry in India and find out the reason behind the strategic failure of the government policies of flagship missionsin bringing out positive results. The findings provide policy lessons for strategy execution excellence of future plans and policies.

METHODOLOGY

In order to evolve a research and policy framework for policymakers, a holistic analysis of the developmental schemes of the National Mission on Bamboo Application (NMBA), Ministry of Science and Technology (Government of India) in the northeast has been exercised and institutional arrangements have been suggested in this study.

SN.	Factors	Citations
1	Strategy Execution Excellence	Ackermann and Steinmann (1982), Cleaves (1980), Gunn (1978), Hogwood and Gunn (1984), Hucke (1978), Majoneand Wildavsky (1978), Ross (1984)
2	Stakeholders' Coordination	Ackermann and Steinmann (1982), Berman (1980), Browning, Marshall, and Tabb (1981, 1984); Browning and Marshall (1976), Bryner (1981) Bullock (1980), Durant (1984), Hays (1982), Levitt (1980), Mueller (1984), Murphy (1971, 1973, 1974, 1976), Skelcher, Hinings, Leach, and Ransom(1983), Smith (1973), Sorg (1983), Schmelzer (1992), Bryson &Bromiley (1993), Kargar& Blumenthal (1994), Miller (1997), Ghamdi (1998)
3	Research and Assessment	Alexander (1985), Altenstetter and Bjorkman (1976, 1977) Ball (1976), Berman and McLaughin (1976); Berman (1978): McLaughin (1976), Hambleton (1983), Jones (1980), Weiler *et al.* (1982), Stonich (1982)
4	Human Resources & Skill	Berman and McLaughin (1976); Berman (1978): Mc Laughin (1976), Goodwin and Moen (1981), Gross *et al*. (1971), Ingram and Mann (1980), Luft (1976), Mechling (1978), Sapolsky (1972), Ali and Hadi (2012)

SN.	Factors	Citations
5	Operations and Supply Chain Chain	Altenstetter and Bjorkman (1976, 1977) Ball (1976), Chase (1979), Hrebiniak and Joyce (1984), Galbraith and Kazanjian (1986), Hamhavek and Cannella (1989), Okumus (2001, 2003)
6	Availability and Allocation of Resources	Browne and Wildavsky (1984), Davies and Mason (1982)
7	Policy Formulation and Structure	Ackermann and Steinmann (1982), Baum (1976, 1981), Elmore (1976, 1977, 1978, 1979-80, 1985), Jones (1980), Lazin (1980), McLanhan (1980), Pesso (1978), Stonich (1982), Hrebiniak and Joyce (1984), Galbraith and Kazanjian (1986), Hamhavek and Cannella (1989), Thomson and Strickland (1995), Waterman *et al*. (1980), Pettigrew and Whipp (1991), Skivington and Daft (1991), Schmelzer (1992), Bryson and Bromiley (1993), Kargar and Blumenthal (1994), Miller (1997), Ghamdi (1998)
8	Customer Relationship and Communication	Bunker (1972), Edwards (1980), Nixon (1980), Thomson and Strickland (1995), Skivington and Daft (1991)

The conceptualization of the study is limited to the Bamboo plantation and technology application schemes of National Bamboo Mission (NBM) and National Mission on Bamboo Application (NMBA). Based on the literature review, the various factors affecting the policy implementation have been analysed. The factors identified are classified into 8 broad catagories for factor analysis.

Total Interpretive Structural Model (TISM) technique has been applied to find out the relationship among factors and their significance/ impact level. Experts were asked 26 questions to track the relationship and impact of different factors with each other. Based on the views of the experts interviewed the researcher to map the Direct and Transitive Factor Links.

TOTAL INTERPRETIVE STRUCTURAL MODELING

The TISM model is a diagraph having the connective information about the elements written in the boxes and relationship via symbols and interpretations. It indicates the inter-relationships among the elements relationship among factors and provides a clear picture with interpretation for better understanding of the elements. To arrive at a TISM model we prepare Structural Self-Iteration Matrix.

The group of experts was questioned to give their view on the relationships between any two elements and its direction. The views of experts are converted into symbols for SSIM to express the relationship between two elements and its type. The four symbols used for this purpose are:

i. V, if element A is related to B but not in both directions;
ii. A, if element B is related to A but not in both directions;
iii. X, if element A and B related in both the direction;
iv. 0 (zero), if A and B are not related to each other.

The experts were asked 26 questions to track the relationship and impact of different factors with each other. The results were mentioned in the form

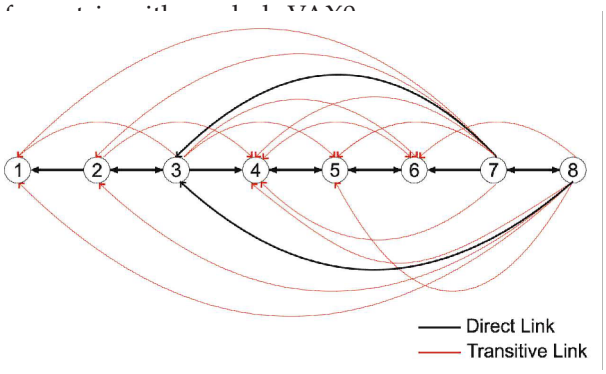

Fig. 1. Digraph Exhibiting Direct Comparisons and Transitive Links

Reachability Matrix

The reachability matrix is prepared in the Table 1.1 by converting the symbols given in each entry of the SSIM into 1's and 0's. The transitive links were mentioned with the '*' symbol.

Level Partitioning

After the preparation of the reachability matrix, it is processed for the level partition to extract the digraph. The Intersection Set is prepared by finding the common elements of the Reachability Set and Antecedent Set. Matching of the Reachability Set and Intersection Set gives the level of the factor. The

first, second, third and fourth level partition is given in Table 1.2, 1.3, 1.4 and 1.5, respectively. The consolidated level partition is given in Table 1.6.

Total Interpretive Structural Model

By identifying the highest to lowest level elements, the structural model has been prepared from the information given in the level partition. The names of elements are indicated in the respective boxes at their level derived from level partitioning and their respective relationship is indicated as worked out in the digraph. Finally, the total interpretive structural model has been prepared for the problem, i.e. ineffectiveness of bamboo technology assistance policy in the northeast.

RESULTS AND DISCUSSION

The total interpretive structural model interprets the links in terms of the contextual relationship and its direction for each pair of elements (Sushil and Gerhard, 2015). In Fig. 1.2, the TISM model identifies policy structure and communication as driver factor which dominates all other elements. The ineffective communication system adversely affected the stakeholder's coordination and it has been observed that the scheme failed to take customers' demands and preferences into consideration. In the absence of proper information and coordination among the stakeholders adversely affected the investigation of project feasibility. Which overall affected the strategy execution excellence of the policies.It has been observed that the implementation authorities neither possess necessary data on bamboo resources of northeast nor they contacted the state authorities for valuable input. According to experts, R&D coordination among the two missions was negligible which led to insufficient R&D support to the industry stakeholders. As such we can say that due to lack of coordination and R&D the authorities were not in a position to judge the feasibility of the funded projects. Most of the entrepreneurs supported under the scheme were first generation entrepreneurs with a lack of technical know-how. The selection of wrong projects and entrepreneurs was the first grievous mistake.

The project selection is the most important activity which defines the basic structure of the future line of action. Having a lack of information and state coordination, the NBM and NMBA were not efficient in assessing the feasibility of projects.

As per the results of the Total Interpretive Structural Modeling, the ineffective communication system and stakeholders' coordination led to improper assessment of the project feasibility. The schemes doesn't gave due importance of Pan India

Table 1. Reachability Matrix

S N	FACTORS	1	2	3	4	5	6	7	8
1	Strategy Execution Excellence	1	0	0	0	0	0	0	0
2	Stakeholders' coordination	1	1	1	1*	1*	1*	0	0
3	Research and Assessment	1*	1	1	1	1*	1*	0	0
4	Human Resources and Skill	1	0	0	1	1	1*	0	0
5	Operations and Supply Chain Chain	1	0	0	1	1	1	0	0
6	Availability and Allocation of Resources	1	0	0	1*	1	1	0	0
7	Policy Formulation and Structure	1*	1*	1	1*	1*	1	1	1
8	Customer Relationship and Communication	1*	1*	1*	1*	1*	1*	1	1

*denotes transitive link

Table 1.6. Level partitions: Consolidated

S N	FACTORS	Reachability Set	Antecedent Set	Intersection Set	Level
1.	Strategy Execution Excellence	1	1,2,3,4,5,6,7,8	1	1st
2.	Stakeholders' coordination	1,2,3,4,5,6	2,3,7,8	2,3	3rd
3.	Research and Assessment	1,2,3,4,5,6	2,3,7,8	2,3	3rd
4.	Human Resources and Skill	1,4,5,6	2,3,4,5,6,7,8	4,5,6	2nd
5.	Operations and Supply Chain Chain	1,4,5,6	2,3,4,5,6,7,8	4,5,6	2nd
6.	Availability and Allocation of Resources	1,4,5,6	2,3,4,5,6,7,8	4,5,6	2nd
7.	Policy Formulation and Structure	1,2,3,4,5,6,7,8	7.8	7,8	4th
8.	Customer Relationship and Communication	1,2,3,4,5,6,7,8	7.8	7,8	4th

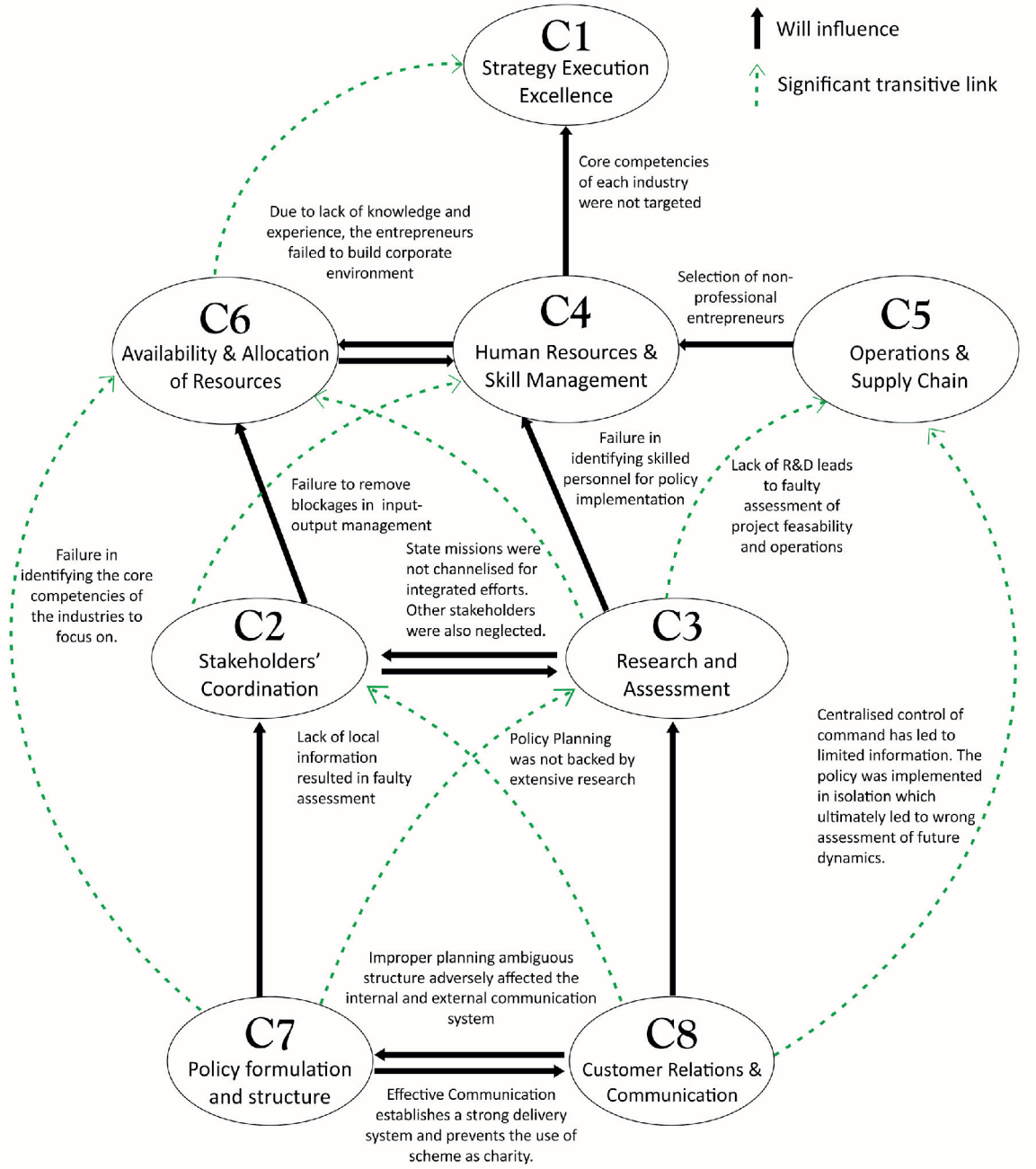

Fig. 1.2. Total Interpretative Structural Model (TISM)

Demand and Supply chain system.

The in-depth analysis of the factors reveal that the establishment of two Bamboo Missions was an enthusiastic step of the central government but with the passage of time became just another scheme with too many objectives untouched. It has been observed that the scope and activities of several parallel bamboo mission overlapped. Many activities were duplicated like expenditure on similar activities and researches due to lack of coordination.

One of the first steps to be identified by any Mission is to identify the core competencies of the sector in which the state or region entertains the competitive advantage. The next step should be to develop a comprehensive strategy for implementation to achieve the desired goals. Since the northeast is a den of opportunities, we need to concentrate on certain areas only and prepare a separate strategy for each sector. The optimum

utilization of resources will be the key to achieve success by strategy executive excellence.

CONCLUSION

Bamboo which is integral to the lives of millions of farmers and entrepreneurs has been a 'blue-eyed boy' for every government – but we are still far away from China in terms of production, innovation and market share. In spite of having several central and state-sponsored schemes, the bamboo sector is the last option which anyone would like to choose for livelihood.

Since Independence, the governments have been planning several policies and schemes for the development and prosperity of the nation, but where they fail every time is in its successful execution. Strategy execution excellence should be the foremost aim of every policy or else the objectives of the policy would remain a distant dream. In a country where the situation of farmers is still vulnerable and they are committing suicide, lack of training and adequate knowledge, lack of coordination among– tells a disappointing story that despite huge funds and 'heterogeneous' government àgencies, India's North East is far behind in bamboo sector.

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