
**The Tea Corridor Theoretical Construct A Programme for Smallholder
Farmer Cultivation for Export**

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doi.org/10.51505/IJEBMR.2025.9709

URL: <https://doi.org/10.51505/IJEBMR.2025.9709>

Received: Jun 27, 2025

Accepted: July 04, 2025

Online Published: July 14, 2025

Abstract

This manuscript posits a theoretical construct for the cultivation and export of tea, as a strategy for the optimal resource use of idle slopes in the Cordillera. This meta-analysis is a compilation of cross-sectional data synthesized using mathematical rigor by stochastic abstraction to complete a comprehensive study with the original methodology for determining tea yield. To substantiate the rudiments for cross-border competence, a Tea Corridor “equation” is defined in a mathematical construct with specific relevance for conjectures of tea cultivation for the empowerment of Accession.

The equation obtained the tangible limit of three rudiments: yield constant ratio— Y_0 ; land utilization— ζ ; and the purchase value constant ratio— χ .

The yield constant ratio Y_0 is derived as the sum of yield-hectares, yield-substrate, yield-weed-slump and yield-weed-envelope. Land utilization ζ is a dependent variable defined by the labor in agriculture divided by the mean persons per hectare. ζ in all instances is less than the total area to comprise the elevations ideal for tea growth determined by the National Mapping and Resource Information Agency/NAMRIA. Finally, X is the purchase-value constant ratio determined through stochastic abstraction of 25-year prices in tea auctions published by the London Tea Brokers of tea farmers in Africa and India.

The Tea Corridor evolved into a National Programme of the Department of Agriculture implemented across four distinct agencies: the Bureau of Plant Industry for Plant Material, the Bureau of Soils & Water Management for Water impounding Facilities, the Agricultural Training Institute for Farmers Training and Skills Transfer, the International Affairs Division for Exporting Activity and Target 15 Tea Demonstration Gardens, and the National Urban & Peri-Urban Agriculture Program.

Keywords: Tea Corridor; Yield constant ratio; Land utilization; Purchase value; Accession; Smallholder farmer

1. Introduction

1.1 Idle slopes put to use

This research is a call to action for economic structural transformation of the Cordillera, crucially and specifically for a handful of deprived barrios derived from farming. The study highlighted the need for a greater effort to introduce alternative high-value crops suitable for cultivation in the idle rough elevated terrain, good enough for export, and for upgrading from a current sheer subsistence. The contribution of the agricultural sector to GDP and GDP performance indicators was a deficit in terms of trade. The Philippines trade deficit for 2019 for vegetables alone amounted to 123.7614 billion pesos.

Tea as a rudimentary high value crop for export, began with a preliminary expedition in 2017 by George Cham of the Federation of Filipino Chinese Chambers of Commerce & Industry, Committee of the Belt and Road Initiative to the Benguet State University with the idea of cultivation for export. Then University President incumbent declined the proposal, given the mandated priorities for land use and no tea experts. Five years afterward, the FFCCCII-OBOR Chairperson asked the help of the author, who had taken this further with extensive multisectoral collaboration.

With sanction of the Benguet Governor Melchor Diclas & Provincial Agriculturist Delinia Juan, critical priorities and responsibilities had been aligned through multisectoral exchanges. The DA Bureau of Plant Industry Director Gerald Glenn Panganiban; DFA Office of International Economic Relations Asst Secretary Vincent Paul Uy; DTI-CAR Regional Director Juliet Lucas; NEDA Agriculture and Natural Resources Director Nieva Natural; DoF International Finance Group Undersecretary Mark Dennis Joven; DoF Bureau of Customs Commissioner Bienvenido Rubio; and DOST PICAARRD Ofelia Domingo & Renerio Lucas.

Particularly for the Department of Agriculture, the agencies and bureaus the vanguard of the Tea Corridor included the International Affairs Division Abigail Amestoso Millanes; the Regional Field Office – Cordillera Region Regional Director Jennilyn Dawayan; High Value Crop Development Division Chief Judy Costa & Ellen Camut; the Bureau of Soils and Water Management Engr. Diana Escote, the National Plant Quarantine Services Division Director Ruel Gesmundo, the National Urban and Peri-Urban Agriculture Programme and the Bureau of Plant Industry. For the observance of convention and rigidity, the Benguet State University College of Agriculture; the NAMRIA for OrthoImages; and the Philippine Atmospheric, Geophysical and Astronomical Services Administration/ PAGASA under the DOST; for climate data.

A first response was made early in January 2021 from the Office of the Mayor of Kapangan Manny Fermin and Chief Agriculturist Peter Begawen for cooperation; in the same way, the Office of the Mayor of Bokod Thomas Wales and Chief Agriculturist Gerald Beray promptly responded.

A general request for concrete information, a reference document or a project charter for evaluation by the government is subsequently made available. This prompted work on the Tea Corridor Template. The template was released on July 13, 2021, to the Office of the Governor and the Local Government Units. Over the same month, the concept was introduced to the NEDA and the RP Consulate in Beijing, including Karlo Nograles for the cabinet to weigh up perceptions and support.

In 2022, Senior USEC Domingo Panganiban looked into the project brief and delegated the International Affairs Division to provide guidelines on how to proceed for the possible export of farm produce; and DA Bureau of Plant Industry Director Gerald Glenn Panganiban.

At the same time, the smallholder farmer survey component was sent to the Bureau of Fisheries and Aquatic Resources/BFAR for participation across the Farm and Fisheries Clustering and Consolidation groups, which endorsed the item to the RFO-CAR. In other words, the theoretical construct routed across departments to seek instruction or procedural clarification and proved very helpful in qualifying the jurisdiction of authority on farm produce export activities.

For dataset generation, collaboration with NAMRIA started in May 2021, with a person responsible for continuing exchanges over thematic maps, geostats, and info for data capture. A Memorandum of Understanding/MOU with NAMRIA for the services was signed by the Undersecretary Peter Tiangco; and the first Orthoimages were released May 28 by Engr. Janette Javier. NAMRIA followed through with corrections of the datum zones and, in August 2021, a finalized reference document in shape file format, showing contour data for Bokod and Kapangan at intervals of 5-10m.

In April of the following year, a more detailed request was negotiated, with estimates for village approximate areas of ideal elevation. All six sites for the pilot villages were listed for contouring; the specifications were finalized by May 22nd. Correspondingly, the MOU for GEOSTATS processing signed in June 2022. Over the following months, the complete transmission of Orthoimages of Geostats was shared with the towns of Kapangan & Bokod in May 2022.

The DOST PAGASA Climatology and Agrometeorology Division/CADS completed the generation of climate data in June 2022. The successful collaboration covered 12 years, month-to-month, and was issued by Scientist Christian Mark Isonby the approval of Chief Rosalina De Guzman.

Scholastic helm had been held at the Benguet State University involvement is top down from then incumbent University President Felipe Salaing Comila, the VP in Research Dr. Romeo Gomez responded in 2021. By the summer of the succeeding year, a research panel had been constituted by Dr. Leonard Apilis of the BSU Open University with the panel advisor Dr. Constantino Sudaypan, Dean of Agriculture, and the panel members Adjunct Professor Christine Abellon and retired Director Andres Basalong. The research results invoked accession to the One Belt One Road Initiative over the Pandesal Forum on June 30, 2023, in Quezon City with

FFCCCII President Cecilio Pedro and Parros Poon. Embassy delegates of the People's Republic of China/PROC Second Secretary for Commerce & Economy, Mr. Bai Xun with Mengdi Cao and for Agriculture Dr. Yugiang Zhao. Pandesal forum was followed by a postpresentation event through garden tours in the towns of Kapangan and Bokod.

1.2 Keynotes in a conversation with Second Secretary Bai Xun

Over the tour of selected garden sites advisement, advisement rendered by Second Secretary Bai Xun of the Chinese Embassy in the Philippines, Commerce & Economy Division:

1.2.1 Formulation of Policy

With the Tea Corridor, Undersecretary Bai Xun articulated concern "the Tea Corridor project objectives should not be compromised. Policies crafted to help the smallholder farmer are of foremost importance." To enable policy, the involvement of the Senate Committee for Agriculture, Food and Agrarian Reform had been urged.

1.2.2 Engagement of a Tea Expert

Tea experts or tea masters should come on board to be sure of the development of the demo farms and to decide on the type of tea to be cultivated.

1.2.3 Importation of Seeds Discouraged

The idea that seeds are to be donated by the FFCCCII is incorrect because countries protect their own seed banks, and a country may sell them to the Philippines, but this is not certain.

1.2.4 Closed Market Trade Imperceptible

A closed market was not perceptible until this time, as the quality of cultivated tea was proven. The quality of produce must be proven desirable before exportation takes place and is sustained. All the embassies can do this by opening the Chinese market for the importation of the farm produce of smallholder farmers.

1.3 National programme of the Department of Agriculture

To meet the expectations of OBOR, a request for a policy formulation was submitted to the Senate-Chair Cynthia Villar for the Committee of Agriculture, Food and Agrarian Reform, on the stated policy reforms in the research:

- For policy, the children of the Tea Corridor smallholder farmer are put through the university by way of an education maintenance allowance/EMA.
- For policy to state the benefits for barrios from national infrastructure projects for the installation of adequate water supply and drainage for farms and households.
- For policy to state national infrastructure projects for sufficient inner roadwork and overlays in these barrios, the abolition of manual haul in rugged terrain.
- For policy, the constitution of the budget and basic rule for the BPI is to create a unit for the

cloning of tea cuttings to establish genetic uniformity.

- For policy, the constitution of the budget and basic rules for farmer subsidies for land preparation of demonstration farms should be established.
- The policy for the constitution of the budget and basic rule for the DTI RO is to establish and monitor procedures as appropriate.
- For policy to state the constitution of the budget and basic rule for two-staff deployment at the Municipal Agricultural Office, which is sustained for five years, the tea farmer's productivity of high-value crops should be assisted and monitored.
- For policy, the constitution of budgets and basic rules for the BSU Research Center to support farmer productivity should be stated.

By January 2024, Tea Expert Rowena Leoncio joined the Tea Corridor. Tea Expert Leoncio is ITMA certified in the USA. With that, the Tea Corridor called for the first farmer's training for tea cultivation and processing.

The response dynamics recognize three provinces: Benguet, Kalinga and Mt. Province. Gung-ho, among all, goes to Tuba, followed by an even rate of response between Itogon, Bokod, Kabayan and Kapangan. Interest in the Tea Corridor stirred an age band from 23 years young to 67 years old. The median age significantly increased to 48 years in the Agricultural Industry. In terms of gender representation, women outnumbered men in the Tea Corridor interest, with men comprising just about $\frac{1}{4}$ of the women's representation. At this juncture, the author of the Tea Corridor then requested absorption by the Department of Agriculture and was successful.

1.4 Impact pathway: Abolition of the cycles of disadvantage

A log-frame is a methodical approach to derive projects objectives and verification means; activities and indicators, based on a set of assumptions. On the overall, table 1 establishes the log-frame for the research utilizes a deductive approach, as it examines a theory or phenomenon to test its validity within a specific circumstance. The deductive approach observes the most logical path, defining (Wilson, 2010) a theoretical construct that directs the study structure in compilations or meta-analyses to validate the equation. Deductive reasoning is discerned from a general perspective to particular specifics (Gulati, 2009). The case study compilation recognizes verified field research work as tangible results of specific tea cultivation objectives. These tangible results are collated as explanations that establish strong predictions, if not derivatives, to validate the viability of tea production in the Cordillera under similar climatic conditions. These derivatives are general, average, and representative of standardization.

Table 1. The Impact Pathway Logical Framework of Verifiable Indicators

First Key Result: increased resource utilization, land/water optimum		Second Key Result. increased yield/high value crop		Third Key Result: better life. abolition of the cycles of disadvantage	
<i>Objectively Indicators</i>	<i>Verifiable</i>	<i>Objectively Indicators</i>	<i>Verifiable</i>	<i>Objectively Indicators</i>	<i>Verifiable</i>
✓ Change in idle land in the areas of Nawal, Pito & Karao; Gadang, Sagubo & Pongayan of elevation between 1000-1400 meters (Decrease)		✓ Change in export volume in metric tons (Increase)		✓ Change in earnings and minimum wages (Increase)	
✓ Change in number of registered small-scale farmers (Increase)		✓ Change in production volume in metric tons (Increase)		✓ Change in job creation (Increase)	
✓ Change in hectares of land use for tea plantation (Increase)		✓ Change in GDP capita (Increase)		✓ Change in living standards (Improvement)	
✓ Change in road ratio than 22.4 km per 10,000 persons		✓ Change in number of active farmer organizations (Increase)		✓ Change in number of enterprises in the municipality (Increase)	
✓ Change in cost of transportation after road (Decrease)		✓ Change in earmarked taxes for equity at local level (Increase)		✓ Change in number of Out of School Youth (Decrease)	
✓ Change in frequency of manual hauling (Abolition)		✓ Change in GDP contribution for region & province (Increase)		✓ Change in schooling completion (Increase)	
✓ Change in landslide frequency (Decrease)		✓ Change in municipal profile (Positive)		✓ Change in number of persons living in poverty (Decrease)	
✓ Change in volume of water distribution (Increase)		✓ Change in national Government revenue allocations (Decrease)		✓ Change in political bashing (Decrease)	
✓ Change in traffic volume in no of vehicles (Increase)		✓ Change in taxation collection efficiency of LGU (Increase)		✓ Change in number of unemployed (Decrease)	
✓ Change in water-related health disease & deaths (Decrease)		✓ Change in voter participation (Increase)		✓ Change in worker protection contributions (Increase)	
		✓ Change in farm technology (Improvement)		✓ Change in number of Professionals & skilled workers (Increase)	

Means of Verification

- ✓ Department of Health & WHO Reports
- ✓ LGU Profile
- ✓ NAMRIA maps on elevation contours
- ✓ NAMRIA maps on elevation contours
- ✓ Philippines Statistics Authority Reports

Means of Verification

- ✓ Bureau of Internal Revenue Reports
- ✓ DA RED Reports
- ✓ Department of Agriculture Reports
- ✓ Department of Trade and Industry
- ✓ Food Development Authority Reports
- ✓ PhilExport Portal
- ✓ Philippines Statistics Authority Reports

Means of Verification

- ✓ Bangko Sentral ng Pilipinas Reports
- ✓ Department of Education Reports
- ✓ Department of Labour & Employment Portal
- ✓ Department of Social Welfare & UN Reports
- ✓ Philippines Statistics Authority Reports
- ✓ Professional Regulations Report

Assumptions

- ✓ International standard on built environments is observed
- ✓ Tea Corridor proceeds with least anomalous activity
- ✓ Trade Treaty of 50 years is observed

Assumptions

- ✓ Farmers observe international conventions for tea growth
- ✓ Tea Corridor does not identify with any political party
- ✓ Philippine resilience in currency exchange volatility

Assumptions

- ✓ A smallholder farmer is self-motivated and wants to improve the conditions of the industry
- ✓ Philippine resilience in World financial crisis

Risks

- ✓ Climate change does not dry out the water source abruptly
- ✓ National Government takes over project ownership and develops the existing EPZA as the port of entry

Risks

- ✓ Climate change does not reduce rainfall abruptly
- ✓ Cotabato Government forges better trade offer with PRC-BRI
- ✓ Political party clash on the priority locations of the Tea Corridor

Risks

- ✓ Infiltration of leftist groups asserting to maintain the status quo to keep farmers poor
- ✓ Political party populism and hegemony is pursued rather than the pure logic of structural transformation

The case-study methodology is apt, as this research aims to elicit tangible, contextual, in-depth knowledge of specific real-world data on tea cultivation. The case-study method explores the rudimentary characteristics, meanings, and inferences of the effects of slumping on tea yield through the impact of weed dominance, among other factors. This is a complex case study

because it looks into multiple case studies to associate and illuminate different aspects of a research problem. The approach is excellent for defining, comparing, evaluating and understanding various components of the theoretical construct (McCombes, 2009). Table 1 puts down the programme logical framework or log-frame.

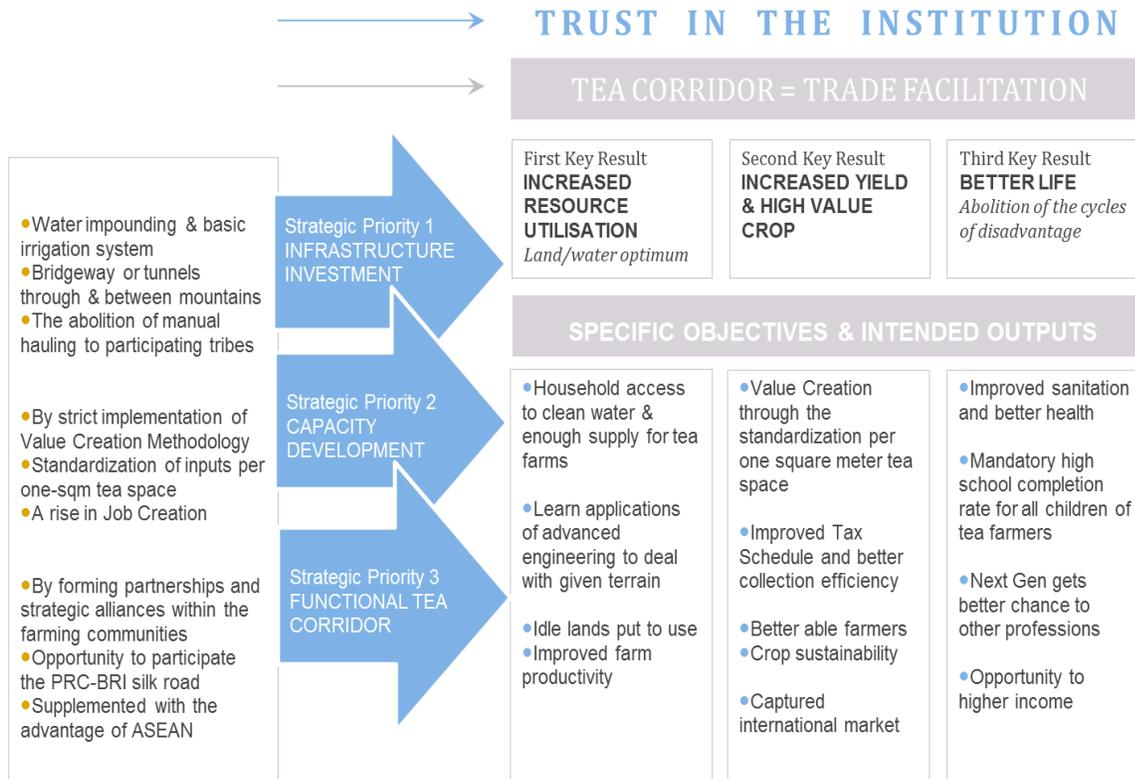


Figure 1. Impact Pathway Conceptual Framework (Adaptation of the theory of change, 2022)

2. Method

This study exploits the meta-analysis technique (Armitage, 2001) for the extrapolation of pertinent data from a cross-sectional compilation of studies on smallholder tea gardens in Bangladesh, China, Japan, Hawaii, India, Indonesia, Iran, Indonesia, Sri Lanka and Scotland;— of verified field research work on tea cultivation, tangible results obtained for specific cultivation objectives. These tangible results are assembled in a probability space of derivatives to comprise the essential elements in tea plant growth, such as substrate composition and weather conditions. To establish strong predictions via these extrapolated derivatives, the stochastic abstraction modelling approach is applied to define tangible limits of the theoretical construct (Knill, 2009), the gateway to cross-border competence. Stochastic abstraction is random between the maximum and minimum limits (Robson, 2002; Saunders et. al., 2019; Jabareen, 2009).

Randomness in this context simply means a random probability distribution or pattern analyses statistically to predict outcomes. This mathematical formula ensures reliability in the simulation

of the probable farm yield, land utilization or level of accession to the international market. Stochastic techniques are broadly used as mathematical systems in a random manner and interpret as a random element in a function (Colin Robson, 2002; Hosch, 2022). The research philosophy applied is positivism. In positivism, the fundamental assumption is that the nature of reality is objective, tangible, and singular (O'Reilly, 2009).

In this study, the compilation is completely cross-sectional and unique to the other studies. The technique compared samples at a single point in time, typically as a snapshot with apt derivatives. A snapshot of a single moment in time does not consider occurrences before or after the snapshot is taken. The snapshot is constructed as events of conclusive earlier work. These inferences and general and average data are synthesized for the extrapolation of tangible limits in the current analysis. Cross-sectional studies assume that time has a random effect that produces only variance and not bias (Lavrakas, 2008).

The illustration of an impact pathway helps envisage the theory of change (Herrendorf, et.al., 1963) and is shown in Figure 1. Whatever change brought forth by the Tea Corridor is linked to alterations resulting in farm revenues (Law Teacher, 2022) and farm sustenance infrastructure (Fernandez-Arias, et. al. 2016). These are measurable changes (Imbs and Wacziarg, 2003). Regardless of how good the research replication is pegged; the impact pathway is focused on a single industry and is location specific in this study (Hawkesford, et. al., 2012).

3. Extrapolation of Values

The tea corridor is an extrapolation of values to derive specific mathematical relevance in a theoretical construct; conjecturing production levels of tea cultivation for the Cordillera: χ is the purchase value, Y_0 is the yield constant ratio, and ζ references suitable land regions and their actual utilization on the basis of labour availability.

3.1 The Element Yield

The element yield is determined at a constant ratio of 1.928412 tonnes with intervals of one hectare. This constant ratio is deduced via stochastic abstraction of yield per hectare, or yield-hectares. Yield Y_0 is composed of four components: yield-hectares Y , yield-substrate Y_1 , yield-weed-slump Y_2 and yield-envelope Y_3 .

3.1.1 Yield-hectares Y

Yield-hectares Y derives of cross-sectional data of 43 tea-producing nations synthesized by stochastic abstraction. Information on the overall land area for tea farming in hectares (Chamberlain, 2019) and the production level in tonnes that correspond to these tea-producing nations constitute the origins of the forecast (Hardin, 2017). The resulting yield-hectares Y escalates with enhancers, which are scrutinized as yield-substrate Y_1 . The yield substrate takes up variables that enable increased levels of tea yield via nutritional inputs, such as lime, to increase the pH of the soil.

The resulting yield is evaluated further via the slump in volume without weed control, adapted in the forecast as yield-weed-slump Y_2 . Yield weed slumps use a number of common weed varieties in terms of abundance, frequency and dominance (Barua and Iswar, 2015). This forecast is realigned by the sheer impact of ecology, which is written as yield envelope Y_3 . Precipitation is the moisture in the rooting environment; if not, a strong watering requirement referred to as the yield envelope. The yield envelope is forecast via historical weather data for the past 11 years. The weather data cover the years 2010--2021 and include monthly temperature, humidity and rainfall data (DOST PAGASA, 2022).

To substantiate the yield constant ratio, Y derives an initial value of 2 tonnes at intervals of 1 hectare. By mathematical computation, it is increased by 37% by the application of yield substrate Y_1 , which is defined as 2.74 tonnes. Then, (-) 0.8768 is deducted as the equivalent 32 percent yield-weed slump Y_2 , and a value of 1.8632 tonnes is obtained. This value is increased by half of yield-envelope $\frac{1}{2} Y_3$ to equal 1.9241 tonnes; alternatively, seven percent of the value of 1.8632 is equal to 0.130424, which is divided by 2 to obtain 0.06521, and added to 1.8632, which equals 1.9241 tonnes.

The value of yield-envelope Y_3 is halved considering that the ideal rainfall of 150–250 mm occurs only half of the year.

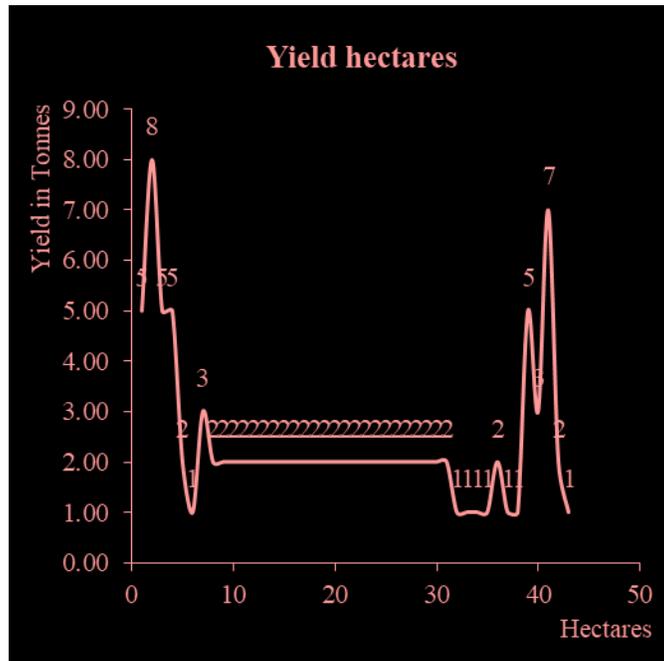


Figure 2 Yield Hectares Y_1

Mean, $\mu = 2.36269$,
Standard deviation, $\sigma = 2.25430$
Upper Limit, $U = 9.12560$

Lower limit, $\cap = (4.40021)$

Stochastic Abstraction $Y = 2.0$ tonnes at intervals of 1 hectare

The data of the following nations were compiled via meta-analysis: Argentina, Azerbaijan, Bangladesh, Bolivia, Brazil, Burundi, Cameroon, China, Colombia, Congo, Ecuador, Ethiopia, Georgia, Guatemala, India, Indonesia, Iran, Japan, Kenya, Laos, Madagascar, Malawi, Malaysia, Mali, Mauritius, Montenegro, Mozambique, Myanmar, Nepal, PNG, Portugal, Russia, Rwanda, South Africa, South Korea, Sri Lanka, Tanzania, Thailand, Turkey, Uganda, Vietnam, Zambia and Zimbabwe.

A large majority of tea-producing nations harvest over one tonne but under two tonnes: Georgia, 1.939 tonnes; Indonesia, 1.308 tonnes; Japan, 1.979 tonnes; Kenya, 1.831 tonnes; Mali, 1.456 tonnes; Mozambique, 1.198 tonnes; PNG, 1.192 tonnes; Rwanda, 1.084 tonnes; Sri Lanka, 1.680 tonnes; South Korea, 1.180 tonnes; South Africa, 1.250 tonnes; Tanzania, 1.907 tonnes; Uganda, 1.871 tonnes; Vietnam, 1.837 tonnes; and Zambia, 1.355 tonnes.

Among the 43 listed nations, China is the leading tea producer, with 1.939 million tons per year and a large land area dedicated to tea cultivation to produce 0.830 tons per hectare. The same is true for Bangladesh (0.955 tonnes), Azerbaijan (0.857 tonnes) and Montenegro (0.813 tonnes). Figure 2 shows the yield by dint of physical space, which is characterized in this research as a constant for tea volume output and is defined as yield-hectares y . This constant is crafted using actual production volume averages for one hectare. Y does not define the quality of tea cultivation or market value.

Figure 2 shows the stochastic abstraction tangible limit of yield-hectares in a probability space of 43 nations. China and Bangladesh utilize large tracts of land as tea gardens, for an average of one ton per hectare: 0.152 tonnes in Russia, 0.215 tonnes in Laos, 0.258 tonnes in Myanmar and 0.234 tonnes in Congo. In terms of yield per hectare, exceptional productivity occurs in countries of diverse settings: Malaysia 9.657 tonnes, Iran 8.652 tonnes, and Portugal 7.368 tonnes, followed by Thailand 6.927 tonnes, Ecuador 5.607 tonnes and Bolivia 5.015 tonnes (Bolton, 2016; Workman, 2021; McCombes, 2019; Chang, 2015; Shahbandeh, 2020)

3.1.2 Yield-substrate Y_1

The yield by dint of the substrate, otherwise plant nourishment, is for consistent plant growth and increased volume production. A tea leaf has a chemical composition composed of a thousand components, which results in the development of a unique phytochemical structure in a classification of types (Ho et.al., 2009). Positive variations between tea leaves of the same type result from the conditions of climate or altitude and oxidation or soil (Yashin et.al., 2015). Tea quality is determined during harvest by the selection of maturity in terms of the polyphenol content or a secondary metabolite or subgroup of the polyphenol called catechin (Hawkesford et. al., 2012).

The soil type suitable for teas can be characterized as rich in humus and a good amount of lime. Light loamy soil has a porous subsoil, and acidic soil has a pH between 4.5 and 5.0. The substrate quality of Bokod is characterized as Ambassador Silt Soil, with a pH between 5.0 and 5.5 in Nawal; Guimbalaoan Annam Complex, with a pH between 5.0 and 5.9 in Pito; and undifferentiated Mountain Soil, with a pH between 4.6 and 4.9 in Karao. The substrate quality in Kapangan is described as containing soil types of Balakbak with pH values between 4.9 and 5.7, mountain soil with pH values between 4.4 and 6.6, Puguis Gr L. with pH values between 4.9 and 6.2, and rough Mtn L. with pH values between 4.4 and 6.4.

The basic substrate requirement of a tea leaf is high (Qiu et.al., 2014). Substrate nourishment is visible in both the shoot extension length and regeneration pace (Venkatesan et.al., 2004). Plant nourishment from substrate properties results in higher yields and readily replaces biomass or plant focus depletion over sequential harvests (Kamande, 2021). Nutrient depletion in tea plants is contingent on the intensity and duration of plucking rounds (Sedaghathoor et.al., 2009). Consecutive leaf harvest empties macronutrients; therefore, replenishment is crucial (Tabu et. al., 2015). Nitrogen (Sitienei et.al., 2012), phosphorus and potassium are the first levels of importance and are often supplemented with calcium, magnesium, sulfur and zinc (Ho et.al., 2009). The low nitrogen content in the substrate reduces the ability of feeder roots to take up nutrients (Ho et.al., 2009), resulting in the loss of potential 5800–6400 kg ha, which is stimulated annually by constant shoot harvest (Owuor & Cheruiyot, 2010). Additionally, lime solutions improve fertility or oxygen levels, improve soil quality and increase the pH between 5 and 10.33 (Ruan et.al., 2007).

Potassium deficiency is visible in thin, weak young plant branches, affecting leaf fall (TRF Kenya, 1997). Feeder roots are less developed and include leaf margins and tips (Sultana et.al., 2014). Phosphorus deficiency becomes visible in leaves without natural gloss. Inefficiencies in the formation of new wood and roots in tea (Neumann & Römheld, 2012). Sulfur deficiency is visible in yellowish leaf veins before they fall off branches (Karak & Bhagat, 2010). N deficiency results in short internodes and a faint green color, stunted development of buds and fewer shoots (de Costa et.al., 2007).

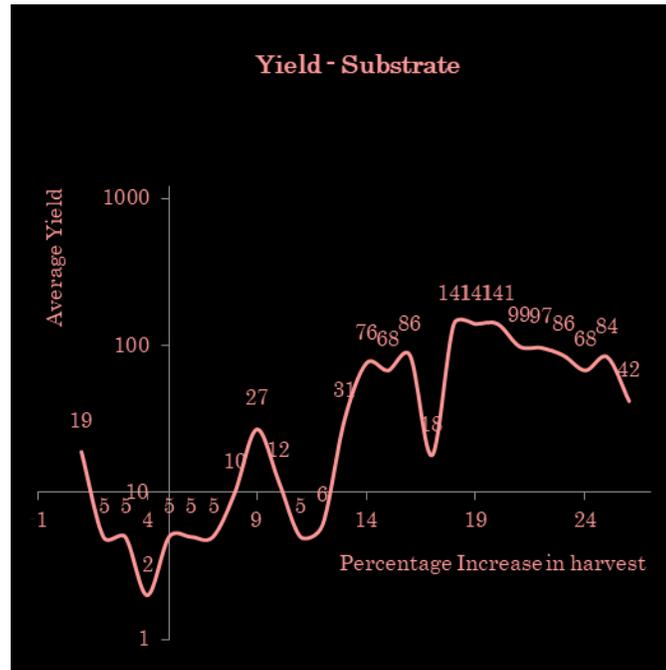


Figure 3 Yield substrate Y_1

Mean, $\mu = 98.76923$

Standard deviation, $\sigma = 36.26558$

Upper Limit $U = 207.56597$

Lower limit $\cap = -10.02751$

Stochastic Abstraction yield substrate $Y_1 = (+)37\%$

Figure 3 shows the stochastic abstraction of the yield substrate in a probability space of five decades for twelve African and Asian countries. The compilation of a cross-sectional dataset of substrate nutrient upper and lower limits in twelve nations over a span of 50 years.

Figure 3 Stochastic abstraction tangible limits of yield substrates in probability spaces of 13 nutrients and 5 decades of studies in Africa and Asia completing 40 varying experiments and 11 different substrates.

3.1.3 Yield weed slump Y_2

Weeds form severe biological constraints that curb plant productivity (Prematilake et.al., 2005). Owing to increased competition in resources, tea yield can decrease to approximately 31.5%, between 22.7% and 36.5%, over wet and dry months, respectively (Barua & Iswar, 2015).

Specifically, for tea, severe competition for nutrients and water uptake occurs when young plants are congested with weeds. The adverse effects on young tea growth include few primary branches and smaller tea leaves (Bidira et.al., 2021). Tea weeds that have been repeatedly studied include 240 species of tea plants from Java, which were examined by Backer and van

Slooten as early as 1924 (Backer & van Slooten, 1924). In 1949, scientists Ano and Nakayama listed 125 species from temperate tea gardens in Japan; then, again, by Soedarsan et al. in 1974, they scrutinized weeds found in tea estates at altitudes of 690 and 1570 meters (Nagaki & Tsushi, 2020).

Weeds that are aluminum accumulators (Konishi et.al., 1985) are ideal tea locations (Ohsawa, 1982). Among these aluminium accumulator weeds common to tea gardens, the following are common to Benguet: *Ageratum conyzoides*, *Bidens pilosa*, *Crassocephalum crepidioides*, *Galinsoga parviflora*, *Paspalum conjugatum* and *Portulaca oleracea* (Napaldet et.al., 2020). Stochastic abstraction outlines the dominance of weeds, which indicates the prevalence of the weed species, the frequency of their repeated appearance over a specific period of time, and the abundance of the weed species.

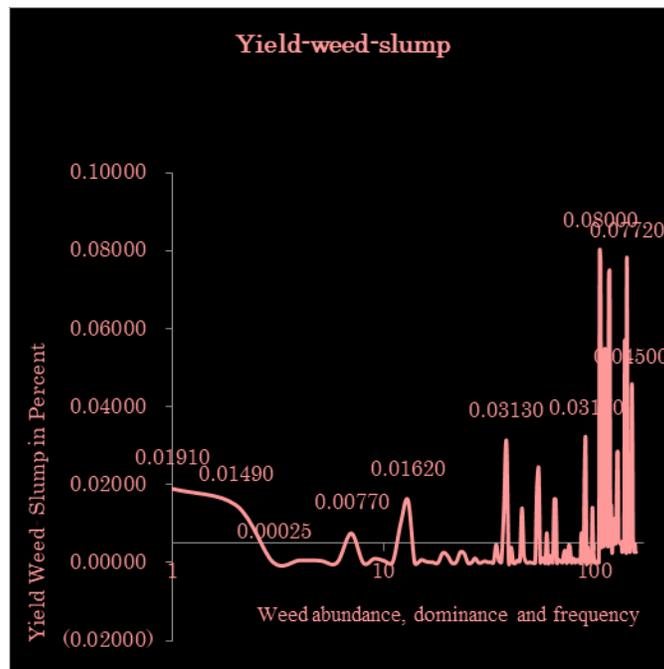


Figure 4 Weed–slump Y_2

Mean, $\mu = 25.89462$

Standard deviation, $\sigma = 35.44292$

Upper Limit, = 132.22338

Lower Limit,

Stochastic Abstraction yield-weed-slump Y_2

Figure 4 Stochastic abstraction tangible limits of yield–weed slumps in a probability space of the frequency, abundance and dominance of 52 tea weed species. This indicates that the yield-weed-slump Y_2 results in 32 percent yield, which is deducted. Figure 4 demarcates the probable

percentage slump in yield as a result of mismanaged weeds via stochastic abstraction $f = (0.12)$ or *negativer 12 percent*.

The correlated mean μ is 25.9, the upper limit U is 132.2 percent, and the lower limit \cap is 80.4. Standard deviation σ is 35.4. Approximately 52 weeds typically found in weed gardens have been reviewed: *Ageratum conyzoides*, *Amaranthus dubius*, *Amaranthus hybridus*, *Biden spilosa*, *Bidens pachyloma*, *Bidens pilosa*, *Bidens polychyma*, *Caylusia abyssinica*, *Commelina benghalensis*, *Commelina subulata*, *Coniza albida*, *Convolvulus arvensis*, *Conyza albida*, *Corchorus olitorius*, *Crassocephalum crepidioides*, *Cynodon spp.*, *Cynoglossum lanceolatum*, *Cyperus cyperoides*, *Cyperus erectus*, *Cyperus esculentus*, *Cyperus rotundus*, *Cyprus cyprides*, *Datura stramonium*, *Digitaria abyssinica*, *Echinochloa colona spp*, *Echinochloa colona*, *Galinsoga parviflora*, *Guizotia abyssinica*, *Hydrocotyle Americana*, *Hygrophila auriculata*, *Kyllinga bulbosa*, *Nicandra physalodes*, *Paspalum conjugatum*, *Plantago lanceolata*, *Polygonum nepalense*, *Polygonum spp*,

See Appendix A: Weed accumulators determine soil suitability. Appendix A renders evidence that the soil type in the region is suitable for tea, given the abundance of competing weeds found.

3.1.4 Yield envelope Y_3

Tea bush growth is robust under atmospheric conditions between 20°C and 30°C. Temperatures above 35°C and below 10°C are harmful to the bush. Tea yield and quality are excellent under heavy rainfall between 150 cm and 250 cm, and the substrate is rich in humus, typically a mixture of lime (Saha, 2015) and iron (Yulong et.al., 2010). Tea is a water-loving plant commonly grown on the windward side of mountain ranges, granting cultivation areas well-drained land without water residue. Compared with tea grown at lower altitudes, tea grown at higher altitudes tends to present many desirable traits and often has a higher price. Some conditions become too cold to grow tea, especially above 2400 m in elevation (Wen et. al., 2020).

The yield envelope establishes probable climatic conditions in the localities for the determination of an overall effect on yield, if any. The stochastic abstraction for tangible limits was computed across a probability space of 120 months for temperature, relative humidity and rainfall, as recorded from the DOST PAGASA data for the past ten years, 2010—2020 (DOST PAGASA, 2022). Ideally, the atmospheric temperature for tea growth is between 20 and 30 degrees Celsius. No temperatures should be above 35 degrees Celsius or below 10 degrees Celsius. For the past 20 years, monthly climatic data provided by DOST PAGASA state that these localities have no incidence of temperatures outside the ideal ecological envelope.

The climate conditions within a specific region or locality differ by elevation or altitude. At high heights, precipitation is high, and the humidity is low. The water cycle involves the continuous transformation of water from vapour to cloud formations through condensation and its liquification and release upon cooling through rain, precipitation or snow (Menga, 2017). The predictable periodic change in precipitation is an important factor in determining tea varieties.

Tea leaves present different characteristics during different seasons, altering the flavours produced in a finished product. Regions that are well known for tea production have seasonal climates (Nowogrodzki, 2019).

In terms of ecological aptness, barrio Bokod averages humidity between 75 and 81%, and in barrio Kapangan, humidity averages between 78 and 88%. The temperature in Bokod is between 14°C and 25°C; in Kapangan, it is between 18°C and 25°C. The rainfall in Bokod averages 140 cm, whereas that in Kapangan averages 232 cm. The vicinities under study experienced the most rainfall in the month of August, with the highest recorded rainfall over the past ten years, i.e., 2021 mm, in August 2012. The compilation of a linear dataset of DOST weather data from 2012 is shown in Figure 5. Strong rains between 1003 mm and 2021 mm extend into the months of September and October and were recorded to start early in the month of July in 2019, 2016 and 2013. The amount of rainfall is less than the ideal volume for cultivating tea at 150–250 mm over the past ten years, i.e., the months of October, November and December. Between January and April, the rainfall has been less than 150 mm for the past ten years; the average rainfall is 19 mms in January, 21 mms in February and 44 mms in March. The other months with low rainfall averages are November 91.5 mm, December 63.1 mms and April 109 mms.

In the context of tea gardens (Stephens & Carr, 2009), precipitation has been reviewed, and the findings have been published in the Journal of Applied Geography (Duncan et.al., 2016), which concludes that the impact of drought on tea gardens is negligible. Figure 5 shows the stochastic abstraction for the tangible limit for yield-envelope rainfall within the probability space of 132 months, which is obtained from the randomness between the upper and lower limits.

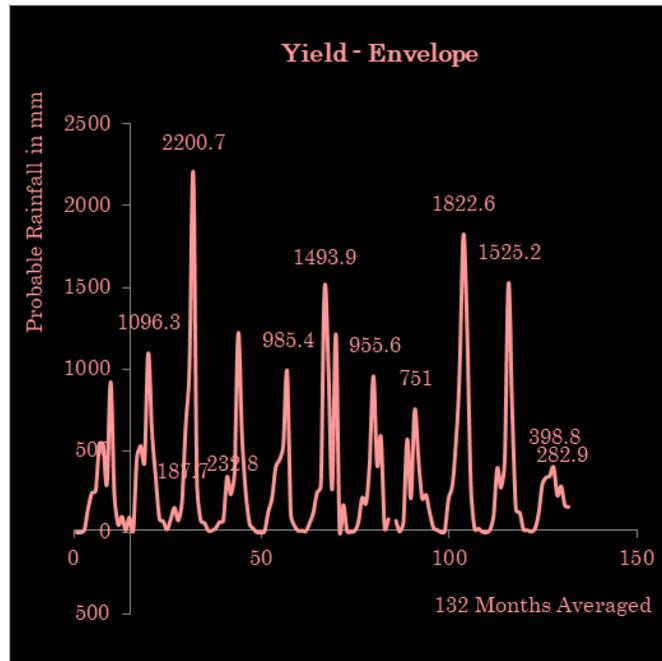


Figure 5 Yield envelope Y_3

Figure 5 shows the stochastic abstraction tangible limit, yield envelope, and rainfall in a probability space of 132 months. Figure 5 shows that between January and April, the rainfall is less than 150 mm, with an average low rainfall during the months of November and December. Rainfall for tea cultivation should be 150–250 mm; however, nearly every half of the year, natural water sources are inadequate, and water provisions for tea cultivation require investment in sturdy impounding facilities.

*Rainfall in the month of November has a mean μ of 83 mm, with an upper limit U of 289 mm and a lower limit \cap of 123 mm. Standard deviation σ is 69, and stochastic abstraction occurs at $f = (60)mm$.

*Rainfall in the month of December has a mean μ of 57 mm, with an upper limit U of 227 mm and a lower limit \cap of 112 mm. Standard deviation σ is 56, and stochastic abstraction occurs at $f = (81) mm$.

*Rainfall in the month of January has a mean μ of 21 mm, with an upper limit U of 112 mm and a lower limit \cap of 70 mm. Standard deviation σ at 29 and stochastic abstraction at $f = (50)mm$.

*Rainfall in the month of February has a mean μ of 19 mm, with an upper limit U of 107 mm and a lower limit \cap of 69 mm. Standard deviation σ at 30 and stochastic abstraction at $f = 87mm$.

*Rainfall in the month of March has a mean μ of 40 mm, with an upper limit U of 182 mm and a lower limit \cap of 102 mm. Standard deviation σ at 47 and stochastic abstraction at $f = 106 mm$.

*Rainfall in the month of April has a mean μ of 99 mm, with an upper limit U of 255 mm and a lower limit \cap of 56 mm. Standard deviation σ at 52 and stochastic abstraction at $f = 151 mm$.

3.2 The Element ζ land utilization

The forecast land utilization ζ consumes geospatial data from the National Mapping and Resource Information Authority (NAMRIA), which was derived from the 2014 World View 2 Acquisition and 2013 Interferometry Synthetic Aperture Radar Digital Terrain Model/InSAR DTM at ten-meter intervals to capture the elevations within 1000 meters and 2400 meters. Therefore, the value of ζ cannot exceed the total area in hectares identified as depicted in the orthoimage estimates of the overall land area determined suitable for tea cultivation by the DENR-NAMRIA assessment $\zeta = < \text{NAMRIA orthoimage estimated areas suitable for tea plantations}$. See Appendix B NAMRIA OrthoImages. Appendix B are visual representations of the existing actual elevations that are suitable for tea plantation within the region. The orthoimages had been provided by DENR NAMRIA team of experts is validation to evidence that the natural features of the region are suitable for tea plantation.

Land Utilisation ζ places a priority level on the 2016 Policy Brief by the Congressional Policy and Budget Research Department, which estimates the country derivative of idle land at 1.2 percent of all idle land. In other words, the estimated 1.2 percent by Congress situates that for every 83 hectares of good elevation, only one hectare is most likely idle land (The World Fact Book, 2024).

The overall estimated areas of these six localities with elevations ideal for tea cultivation are as follows: Gadang 1197.7 hectares, Pongayan 1060.2 hectares, and Sagubo 949.8 hectares; Karao 2628.0 hectares, Nawal 3822.3 hectares and Pito 6,989.9 hectares. An optimal pilot region for Kapangan is estimated at 3207.7 hectares and Bokod 13440.2 hectares, with a ratio of 83:1 on idle land. The indicative idle land estimates are Gadang 14.372 hectares, Pongayan 12.722 hectares and Sagubo 11.398 hectares; Karao 31.536 hectares, Nawal 45.868 hectares; and Pito 83.879 hectares. These elevations are shown in the link to the Appendices and are the defined scientific orthoimages. Overall, 161.282 hectares covering all six localities are presumed to be idle land.

ζ or land utilization is a dependent variable, with special mathematical relevance in the theoretical construct for forecasting tea production for the Cordillera, defined as

$$\zeta = (0.23n)/k$$

where n is the forecast labour group of the population between ages 20 and 59, k is the constant 3 tea farmers per hectare of tea cultivation, and 23% is the recognized labour in agriculture. Land utilization ζ is a dependent variable on labour in agriculture and population growth; therefore, the 23 percent measure can change because it is a controllable variable; for example, in instances of labour mobility, it is the temporary direct hires for plucking seasons and an industry shift for worker movement from other sectors. With this constraint, the optimum utilization of land resources is not achieved.

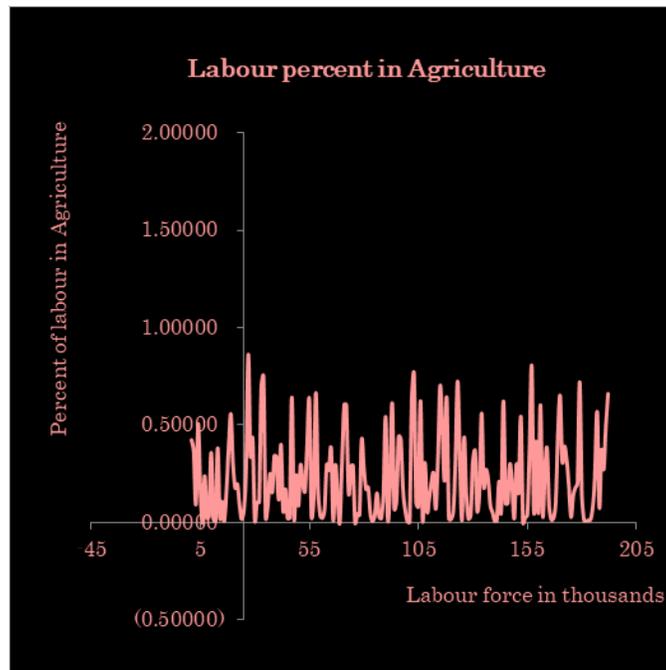


Figure 6. Labour percentage in agriculture

Mean, $\mu = 0.23256$

Standard deviation, $\sigma = 0.87573$

Upper Limit, $= 30.21439$

Lower limit 0.41061

Stochastic abstraction tangible limit labor percentage in agriculture = 29

Tea cultivation is an extensive labour industry, principally for tea plucking. Four of the top ten tea-producing nations have the most efficient farmers: Kenya (40.6 kilogram-capita), Japan (38.59 kilogram-capita), Turkey (37.47 kilogram-capita), and the superhuman tea farmers of Sri Lanka (159.71 kilogram-capita). Two nations outside the top ten lists with high production per capita are Argentina (64.67 kilogram-capita) and Iran (30.20 kilogram-capita). Countries with tea production levels between 11 and 20 kilograms for every farmer are as follows: Malawi, 12.31 kilogram-capita; Mauritius, 19.52 kilogram-capita; and Burundi, 11.43 kilogram-capita.

Figure 6 shows the stochastic abstraction tangible limit: the labor percentage in agriculture within a probability space of 192 countries. From data retrieved from the CIA World Fact Book, the cross-sectional dataset of the labor percentage in agriculture is shown in the resulting stochastic abstraction for the value of N. Figure 6 Demarcates the calculation of stochastic abstraction

The correlated mean μ is 11.9, the upper limit U is 92.49%, and the lower limit \cap is (68.7). The standard deviation σ is 26.86. The stochastic abstraction tangible limit examines the labor percentage in agriculture within a probability space of 192 countries: Argentina, Azerbaijan, Bangladesh, Bolivia, Brazil, Burundi, Cameroon, China, Colombia, Congo, Ecuador, Ethiopia, Georgia, Guatemala, India, Indonesia, Iran, Japan, Kenya, Laos, Madagascar, Malawi, Malaysia, Mali, Mauritius, Montenegro, Mozambique, Myanmar, Nepal, PNG, Portugal, Russia, Rwanda, South Africa, South Korea, Sri Lanka, Tanzania, Thailand, Turkey, Uganda, Vietnam, Zambia and Zimbabwe.

Labour market volatility, which is specific to employment in agriculture, is further synthesized into forecast land utilization. Labour force data are retrieved from the CIA World Fact Book (The World Fact Book, 2024) and are examined by the shares of employment in agriculture at the country level (Ritchie, 2022).

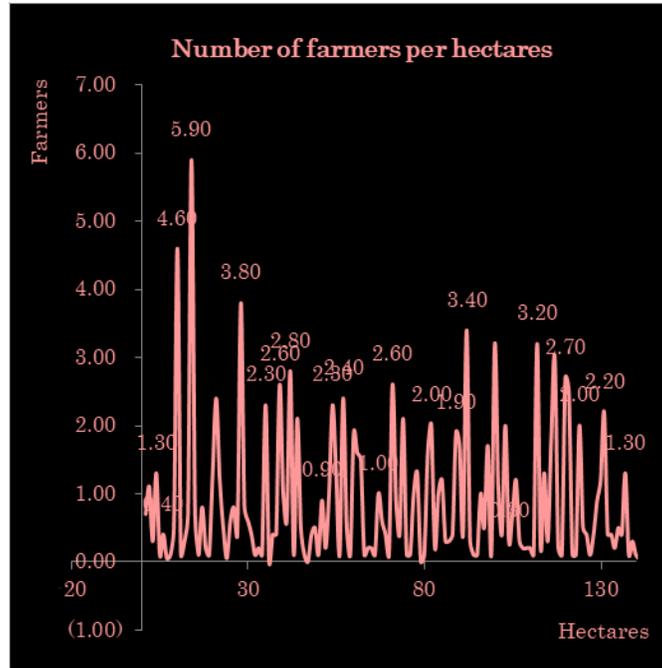


Figure 7. Number of farmers per hectare

Mean, $\mu = 0.90101$

Standard deviation, $\sigma = 1.02465$

Upper Limit $U = 3.97497$

Lower Limit $\cap = 2.17295$

Stochastic abstraction tangible limit labour per hectare = 2.0

Figure 7 shows the stochastic abstraction tangible limit: the number of farmers per hectare within a probability space of 148 countries. Figure 7 uses the Philippine Statistics Authority/PSA Report on the age group breakdown of these localities recognized as the labour group of ages 20-59 and the change in the 2022 PSA Standard Geographic Code; farmers per locality are forecast (Philippine Statistics Authority, 2015), and the corresponding land area ideal for cultivation is forecast in Appendix D.

The number of farmers per hectare in Asian nations ranges between 5.1 and 0.1 depending on the terrain and level of industrialization, averaging out at approximately 1.4, and the Philippines accounts for an average of 1.2 (Hardin, 2017). In the top ten tea-producing countries, the number of farmers per hectare ranges between 3.7 and 0.1: China, India, Kenya, Sri Lanka, Vietnam, Turkey, Indonesia, Japan, Iran and Argentina. Specifically, for tea cultivation, the ideal number of farmers per hectare is between 3.7 and 4.5, particularly for tea gardens, which are between 3.5 and 4.9 (Nation Master, 2000). Crucially, the percentage of labour in agriculture worldwide is on a downwards trend.

For conjectures of land utilization, the equivalence of k or the number of farmers per hectare is determined alongside the mean percentage of the labour force in agriculture by stochastic abstraction. These ratios are critical inputs in the conjectures of land utilization.

These demographics are crucial in the forecast of the labor-intensive tea industry. In fact, it is sufficient to state that the population size of these localities can curtail actual farmer uptake and land utilization without shifting livelihoods or actual labour mobility over the long run.

As an example, Gadang has approximately 200 people involved in farm work, and the initial idle land area of 14.372 hectares would mean that, with the entire working age group of Gadang focused on tea cultivation, the land utilization uptake would amount to 571 hectares, or just 47 percent of the total area ideal for tea cultivation.

Pongayan has the smallest population, and approximately 45 hectares can be properly maintained. Pito has the largest swath, with elevations ideal for tea growth; however, approximately seven percent can be utilized considering the demographics of the locality and lack of technology in harsh terrain.

See Appendix C: Conjectures of land area ideal for cultivation. Appendix C presents the calculations on the realistic land cultivation approximates based on the available labour force in the region. An alternate approach would be to hire additional workforce from the labour market to augment the available local labour force, in order to utilize fully the elevations suitable for tea cultivation.

3.3 The Element χ cost of farm produce, raw unprocessed tea

The cost of farm produce χ is a straightforward stochastic abstraction for a constant ratio set at the significance of 163,680 pesos with intervals in terms of tonnes. The value is derived by stochastic abstraction of tangible limits of the auction prices through 25 years, 1998 to 2022, from the British auctions for Mombasa and Nairobi (Tea Broker's Association of London et al, 2011), as written in Chart 32. The cost of farm produce χ is rudimentary in qualifying the hurdle rate of farm support infrastructure and smallholder farmer equity. For appreciation of the tea industry to include retail and manufacturing components, there are approximately 295 brands and exotic teas. Dark tea, commonly called black tea, has an average retail price of 802 pesos a kilo and approximately 104 brands. Green tea has 43 brands identified, with an average retail of 922 pesos a kilo. Herbal tea has 21 brands with an average retail of 1113 pesos a kilo, and white tea has another 22 brands with an average retail of 5182 pesos a kilo. Matcha tea, with approximately 24 brands, has an average retail of 8905 pesos a kilo. Pu-erh tea, with 24 brands, has an average retail of 1902 pesos a kilo. 41 Oolong teas with an average retail of 5033 pesos a kilo. Just four tea cakes with an average retail of 2824 peso-kilo worth. Exotic teas are obscenely priced and have relatively high historical and cultural functions.

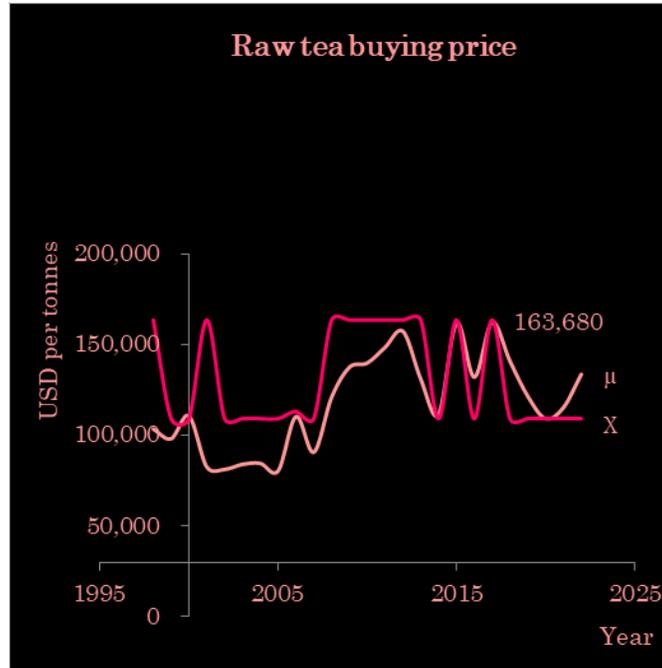


Figure 8 Selling price χ

Mean, $\mu = 103,618$

Standard deviation, $\sigma = 22,990$

Upper Limit $U = 172,588$

Lower Limit $\cap = 34,648$

Stochastic Abstraction Tangible Limit of $\chi = 163,680$

Figure 8 shows the stochastic abstraction for the tangible limit, where the variable χ constant ratio uses the probability space of 300 auction set prices over 25 years. The value of the cost of farm produce χ is a constant ratio in the theoretical construct for determining the plausibility of the Tea Trade corridor.

3.4 Anticipated World Accession

Accession is the manifestation that a nation is accepted as integral to a treaty of another country (Merriam-Webster, 2023)—that had been formerly signed and in force by a group of countries. The legal effect of Accession is equal to ratification. Accession can mean adherence or adhesion in reference to a treaty, wherein a nation does not necessarily sign into the treaty but becomes party to it and expresses free will and consent to be bound by the rules of that treaty (Ballantines, 2017). Accession is the rationalization of barriers to international trade that arises from tariffs or the formation of trade blocks. Accession refers to a specific trade block and the impact of overcoming that barrier (BBC, 2023).

As an example, the PRC Belt and Road Initiative is a trade corridor, initially launched in contradiction of two Trade Blocks with the United States as centerstage: the Trans-Pacific

Partnership alongside the Transatlantic Trade and Investment Partnership (The Economist, 2016). The Trans-Pacific Partnership/TPP, or Trans-Pacific Partnership Agreement, was the biggest trade deal of Head of State Obama, which was opposed down right by both political parties (Carter, 2017). The TTPs included the economies of Singapore, Vietnam, Australia, Brunei, New Zealand, Peru, Canada, Malaysia, Mexico, Chile, Japan and the United States. The TTP was signed in February 2016 but was not ratified; thus, it never came into force (Howard, 2017). The Transatlantic Trade and Investment Partnership (TTIP) is an ongoing negotiation for the assertion of a high-standard trade and investment treaty between the European Union (EU) and the United States and for the accession of American products to European markets through increased access (Oustr, 2023).

The Belt and Road Initiative (BRI), or OBOR, is common within China: "One Belt One Road" is the Silk Road economic strategy that utilizes physical infrastructure on land corridors. The BRI is considered the linchpin of the Chinese leader Xi Jinping's foreign policy. Since 2013, the BRI has deployed an infrastructure development strategy in 150 countries and international organizations, mostly in Asia and Europe.

In the Belt and Road Initiative, the Philippines Chairperson of 2021 George Chua Cham initiated action for a Tea Trade Corridor for the Cordillera smallholder farmers. FFCCCII Incorporated is the country host for the PRC–BRI. The FFCCCI (Pardo, 2016) is the umbrella organization of Chinese businesses in the Philippines; it represents the China Council for the Promotion of Cultivation and Export of Tea. The international organization is responsible for the initial seed provision and farm support infrastructure investment for water holdings and bridgeways. In return, the international organization is the exclusive trader of the produce of these tea gardens, which are bought at a set industry price (McLeod, 2014).

By so, the anticipated accession of the towns of Benguet is delimited to production volumes and quality assurance. For the purpose of this study, the anticipated accession of the Tea Corridor forms a synopsis of the arguments stated on the previous pages. Land utilization is a dependent variable that quantifies land utilization by limiting the prevailing demographics.

In due course, accession to international markets explicates competitive production volumes—at the very least, without noting product quality. To quantify the anticipated volume production, the results of land utilization with gradual uptake every five years are multiplied by the forecast yield-hectares Y0 of 1.92841 tonnes per hectare. It is sufficient to state that this is a marginal approach, rather conservative forecast considering that labour mobility is attainable, as suggested, either from nearby barangays or regional pooling for plucking after tea plant growth of five years.

The results show the strong potential of the locality in international markets, as shown in Figure 9, to forecast yield production by barrio. The illustration, however, does not depict tea magnates China, India and Kenya; Sri Lanka, Turkey 212 and Vietnam; or Argentina, Indonesia and Iran. The Philippines has the potential to compete with Ethiopia, South Korea, Congo, Zambia,

Azerbaijan and Russia by 2040, or just ten years of industry activation, even with a very conservative approach to forecast. For the Philippines in 2030, the yield is 422 tonnes; by 2035, the yield is 882 tonnes; by 2040, the yield is 1377 tonnes; by 2045, the yield is 1908 tonnes; and gradually escalates.

Appendix D confirms the acceptance of the Department of Agriculture, wherein the farmers training had been conducted in March 2024 from the 13th to 15th and had been participated by farmers from the municipalities of Benguet Province, Mountain Province, Kalinga and Ifugao. Appendix D confirms further the translation of the research into a National program of the Department of Agriculture that had been absorbed by four divisions from plant preparation into product export.

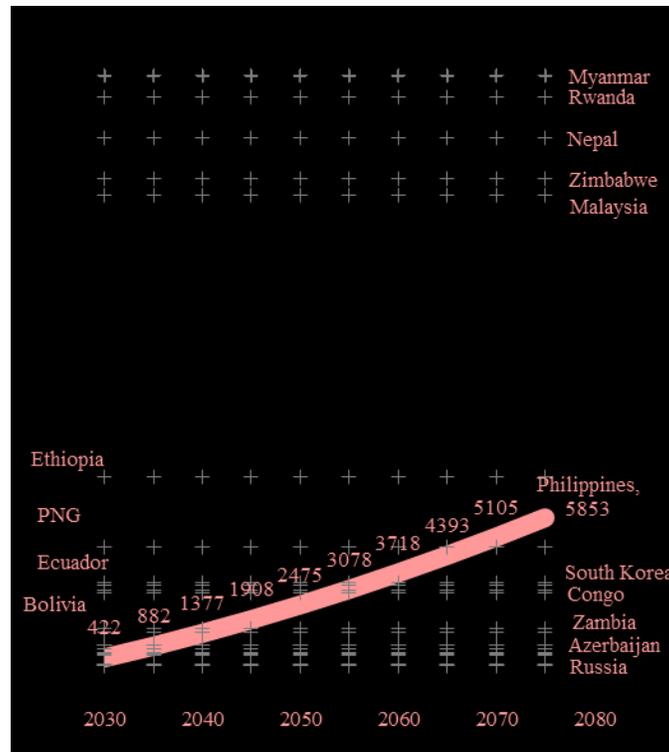


Figure 9 Anticipated World Accession

4 Conclusion

The tenacity to establish the parameters of accession through this equation was successfully achieved. The gateway for cross-border competence is the stochastic abstraction of tangible limits, which substantiates the Tea Corridor as a significant strategy for resource use transition. The theoretical construct defines the Tea Corridor parameters in three elements: yield constant ratio— Y_0 ; land utilization— ζ ; and cost of farm produce constant ratio— χ .

$$\text{Theoretical construct} = \chi Y_0 \zeta$$

The theoretical construct has specific mathematical relevance in the theoretical construct, forecasting production levels of tea cultivation for the Cordillera. The element Y_0 is the designated symbol for yield and is defined as a constant ratio with special mathematical relevance in the theoretical construct. The yield Y_0 constant ratio is set at a value of 1.928412 tonnes with intervals of one hectare. Yield Y_0 is deduced via stochastic abstraction and verified via conventional theory. The weighting of the constant ratio yield Y_0 can change when it occurs. The element Land Utilization ζ is a dependent variable, with special mathematical relevance in the theoretical construct forecasting tea production for the Cordillera. Land utilization is, at all instances, less than the overall land area determined suitable for tea cultivation by DENR assessment [$\zeta < \text{NAMRIA orthoimage estimates and places priority on the 1.2\% indicator country derivative of idle land}$]. Land utilization ζ is defined as

$$\zeta = (0.23n)/k$$

where n is the forecast labour group, which is made up of the population between ages 20 and 59; k is the constant 3 tea farmers per hectare of tea cultivation; and 23 percent is the recognized labour in agriculture derived by stochastic abstraction.

The element χ as the cost of farm production, χ , is a constant ratio set at a significance of 163,680 pesos with intervals in terms of tonne. The value is derived by stochastic abstraction of the tangible limit, which synthesized auction prices through 25 years, 1998, to 2022, from the British auctions for Mombasa and Nairobi (Tea Broker's Association of London et. al., 2011). The cost of farm produce χ constant ratio is rudimentary in qualifying the farmer equity of stable earnings and an excellent hurdle rate for infrastructure investments.

The tea corridor is a theoretical construct for the cultivation and export of tea as a strategy for resource use in the rugged idle slopes in the Cordillera; a compilation meta-analysis of cross-sectional data synthesized by stochastic abstraction concludes the comprehensive feasibility of the original methodology for determining tea yield.

5. Author Contribution

The author had been instrumental in introducing the economic potential of tea cultivation in the Philippines and has sparked the interest of the farmers as well as local market players in this emerging industry (See Appendices).

The Bureau of Plant Industry endorsed the Tea Corridor to the Secretary of the Department of Agriculture, Republic of the Philippines. The component on plant material propagation has been committed to the BPI while other program components have been endorsed to the Bureau of Soil and Water Management, the Agricultural Training Institute and the International Affairs Division. The Tea Corridor is a theoretical construct on the cultivation and export of tea; as a strategy for optimal resource use of idle sloped. A meta-analysis of cross-sectional data synthesized by

stochastic abstraction completes a comprehensive feasibility with original methodology on conjecturing tea yield.

5.1 Appendices

Appendix A Weed Accumulators

Appendix B/NAMRIA MAPS

Appendix C/Forecast land area suitable for cultivation

Appendix D/ BPI Certification

Acknowledgments

Many, many thanks
Dominique Molintas

"This instrument is dedicated to my grandfather Dennis Masa'ao Molintas—and his only son Dennis Sabaoan Molintas. Lolo Tatang was an agriculturist who introduced langka, cocoa, star apple, avocado and the Zamboanga coffee variety to the locality. A school master up until the war changed the course of his life, where the fame of leadership acts of courage in the final battles in the capture of Japanese General Tomoyuki Yamashita made him Statesman. For daddy, whose genius in mathematics and interest in science barely appreciated, executed fall from grace in a sudden tragic voyage to the ancestry.

I thank my family for such lifelong inspiration and thoughtful of my intellectual pursuits: Tchaika, Yanni and Tamiya; Sheryl, Risa, Sari, Isis and Glana; Rohan, Danilo and Bob; JP, Jesus and Lennin; Zeal, Gabriela, Gillian and Riva; Levy, Ryu, Zander and Ragnar.

I am humbled to learn the acumen by the finest mentors and absolutely fortunate to receive the confidence and closeness of trusted good friends."

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