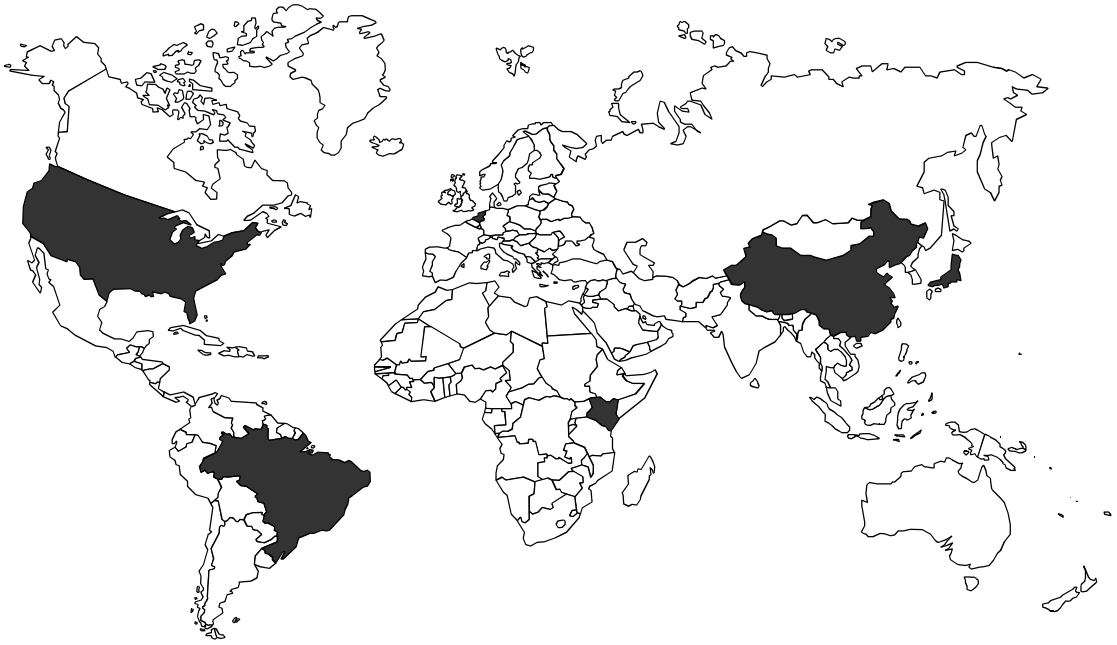
I-TRADE:

the International Trade, Resources and Development Exercise

A role-playing simulation of
the evolving world economy



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I-TRADE PARTICIPANT MANUAL

INTRODUCTION

I-TRADE (the International Trade, Resources, and Development Exercise) is a market simulation laboratory through which you can experience first-hand the workings of the world economy. You will be able to try various economic strategies and see their consequences over several years of production, consumption, and trade.

When you start the I-TRADE exercise, you will be given cards representing all the resources of a sector in a particular country. The amounts of each resource have been tailored to represent real-life countries. If you are given the agricultural sector of a poor country, for example, you will receive a lot of workers, some land, and not much else.

In representing the resources of a sector, you also represent the population associated with that sector's workers. Each worker comes with a family, and the average size of these families differs by sector and by country. In effect, you represent not only a set of workers, but also the whole population that lives with them.

Your job is to represent your population, by managing their resources as best you can. Each resource has some specific physical characteristics, and "Production Worksheets" will tell you how you can turn them into other things for consumption, sale, or investment in future production. A minimum amount of consumption is required for each person to survive. Beyond that, you are free to pursue any goals you like--although your choices are limited by what is physically possible to do, and what the other I-TRADE participants are doing.

Unlike other market simulations, I-TRADE does not specify what people "should" consume, beyond what is needed for survival. I-TRADE is also unlike other simulations in that it does not use computers to simulate other people's actions, and all prices are determined within the simulation through personal, face-to-face negotiations. You may choose to ignore other people, cooperate with them, or treat them as "opponents".

The world of I-TRADE is divided into six countries, each of which is roughly similar to some region of the real world. Each participant is in one of the six countries, which are called Kenya, China, Brazil, the Netherlands, Japan, and the United States. All participants receive identical information packets, but very different initial resources depending on which sector, in which country, they happen to represent.

Each country has five sectors: agriculture, industry, services, trade, and

government. The first three sectors start with enough resources to produce other goods, while the trade and government sectors start with nothing except workers--and your ideas for what they might do. (Some suggestions are given later in this manual.) In addition to participants representing each sector, one participant in each country is the "national statistician", whose only job is to keep records.

Although you start the simulation with the resources for a specific sector, nothing prevents you from trying to take on other roles. Thus, there may not always be one participant representing the resources for each sector. Depending on the number of participants, one sector may be divided among two or more participants, or two sectors may be represented by one participant. This does not change the amount of resources in each sector, or the basic structure of the economy. Whichever participant represents the workers also represents their families: the total population's consumption requirement must be met for the workers to survive.

The rules and sequence of play are relatively simple, but you should think carefully about what you want to do before the simulation is played. Good planning could make a big difference in how much fun it is to play, and in how well you achieve whatever goals you may set for yourself.

SEQUENCE OF ACTIVITIES

In I-TRADE, each "year" of activity is done within a class period. The year consists of two seasons: a "production" season and a "consumption" season.

During the initial production season, participants with resources for production in agriculture, manufacturing and services decide how they want to use those resources (i.e. what and how they want to produce) using "Production Worksheets". At the same time, participants representing the trade sector circulate around making deals to arrange for their consumption needs in the next period; participants representing government implement their policies; and the national statistician collects information for the "Production Report".

During the consumption season producers and traders make their exchanges and complete a "Consumption Worksheet"; the government continues to implement its policies; and the national statistician estimates market prices to compile the "Consumption Report" and the "National Accounts".

Several years of these production-consumption cycles may be completed before the simulation ends, at which point the performance of each participant is compared and discussed. All production, consumption, and exchange is recorded during the course of the game, and accounts similar to those used for real-life countries are produced. In this way, we will be able to tell whether your performance was better or worse than that of your real-life countries, and why.

The Production Season

During the production season you must specify how you want to use your resources, by filling out a "Production Worksheet". This form lists all the potential ways you can transform resources into products. You can use the worksheet to choose which method or technique you want to use, based on the resources available and expected market opportunities.

Your resources will limit how much of each product you can produce using each technique, and your market opportunities will limit what you can do with your products. To discover what those market opportunities are, you will need to talk with other participants, possibly including traders.

The trade and government sectors do not have the initial resources needed to produce anything, but can "earn" goods or money in various ways. Most commonly, traders may buy and sell goods or charge brokerage fees, while governments may be able to collect taxes.

Once you have entered your production decisions on the Production Worksheet, you must deliver the worksheet and the corresponding resource cards to your national statistician. The statistician takes the values on each Production

Worksheet to complete the country's "National Production Report".

After the national statistician completes the Production Report, he/she must bring it along with the corresponding resource cards to the I-TRADE manager, who will turn them into the appropriate quantities of output cards. The statistician then brings this output, along with the original Production Worksheets, back to each producer. The Production Worksheets will be needed by the producer for filling out the "Final Accounts Worksheet" at the end of the year.

The Consumption Season

During the consumption period, you must specify what you want the population of your sector to consume, by filling out a "Consumption Worksheet". Your population's total consumption, divided by the number of people, is the population's consumption per person.

The only goods actually *required* for survival are agricultural goods (i.e. food) and services (i.e. housing). For convenience, the minimum consumption requirement of each has been set at one ton of agricultural. goods and one unit of services, per capita.

If your total available is less than your population, then people die and the population declines until the totals are exactly equal. Thus, the degree of famine depends on the degree of consumption shortfall. For example, if you are three units short of services, three people will die. The non-working population dies first, followed by the workers.

You can choose to provide only the minimum consumption for your population, and use any additional goods for investment and accumulation of capital. Or, you can choose to invest nothing, and consume everything. Whatever you choose, be sure to record it on your Consumption Worksheet!

Once you've completed the Consumption Worksheet, enter the numbers from it on your Final Accounts Worksheet, and then deliver the form to the national statistician along with the product cards representing all goods consumed. The national statistician uses the Consumption Worksheets to compile the National Consumption Report, which he or she brings along with the resource cards to the I-TRADE manager at the end of the consumption period.

In order to compare the economic value of the quantities you've produced and consumed, the national statistician conducts a price survey to obtain average market prices for the goods and services traded and sold during the year. For this survey the statistician will circulate around the country while transactions are taking place, and will ask participants how much they paid (either in gold or in other products) or received for various goods and services.

Once the "national account" is completed, the national statistician hands it

forward to the I-TRADE manager, and may want to give much the same information to the government or others in their country.

TABLE 1: SEQUENCE OF ACTIVITIES

SEASON	ACTIVITY
Start of simulation	Participants receive initial resource cards for their sector.
Production Season	Participants with resources for agricultural, manufacturing and service activities make production decisions and complete production worksheets. Traders circulate and prepare "contracts" with buyers and sellers. National statisticians use the completed production worksheets and compile national production reports. Governments take any actions that may be desired.
Consumption Season	Producers receive their outputs from the I-TRADE manager. Participants buy, sell and consume goods and services, and record their activity on the consumption worksheets. National statisticians collect worksheets from participants and use them to compile national accounts Statisticians also conduct price survey, and bring resource cards to/from the I-TRADE manager.

MATERIALS USED

Before the start of the simulation, each participant receives this I-TRADE participant's manual, and all of the worksheets and reporting forms needed to participate in the economy. Study these carefully, because once the simulation starts you'll need to work quickly.

When the simulation is about to begin, you will also receive your sector's resource cards, that symbolize the inputs and outputs that flow through the economy. Your worksheets and national reports help keep track of this flow. Each of these materials is described in detail below.

Resource and Product Cards

Cards are used to represent the seven types of resources and products which exist in the game. Each type of resource or good has a different color for ease of sorting, and cards are available in several different denominations (e.g. one unit, five units, ten units, etc.). If necessary, the I-TRADE manager can "make change" by trading one large-denomination card for several smaller ones.

The seven types of resources and goods are land, labor, energy, machines agricultural goods, services, and gold. Although real economies produce an infinite variety of goods and services, the seven categories used in I-TRADE capture many of the key features of most products. These characteristics include whether the good is man-made, reusable, movable, or useful as an input in the production of other goods.

One key distinction is whether the good is man-made or purely natural. The three man-made resources are agricultural goods, machines, and services, and the four purely natural resources are land, labor, energy, and gold.

A second key characteristic is whether the good is reusable. Most goods in the I-TRADE economy can be used over and over. They are the four forms of "capital": labor, land, machines and money. In I-TRADE, the only form of capital that is man-made is machinery. Labor represents "human" capital, land is "natural" physical capital, and gold represents "financial" capital. It cannot be used for anything else, but because its quantity is fixed, it serves as a good store of value and medium of exchange.

Goods which are not reusable are energy, agricultural goods, and services. Energy, once used, is gone forever, although it may be saved for use in future years. Energy represents the economy's "nonrenewable natural resource". Agricultural goods and services are perishable. Once produced, they disappear whether they are used or not. Since they cannot be used to invest in future production, they represent the economy's consumer goods.

Another key characteristic is whether the item can be moved from one country to another. In I-TRADE agricultural goods, manufactures, energy, services and money can be used in trades with other countries. Land and labor cannot be moved across national borders, although they can be bought and sold within each country. Land and labor represent each country's "domestic resources" or "factors of production".

Finally, an important characteristic of many goods is that they are used both as inputs and are produced as outputs. Manufactures are produced by the industrial sector and are used in agriculture and services, while agricultural goods are produced by farmers and are used in industry. This circular flow of outputs and inputs is a key feature of economic life. In I-TRADE, there is only one kind of output which is never used as an input. These are "services", which are used only in consumption.

TABLE 2: RESOURCES AND PRODUCTS

ITEM (card color)	UNIT OF MEASUREMENT	CHARACTERISTICS	REAL LIFE EXAMPLES
Farmland (green)	hectares (ha)	-Natural (not man-made) -Reusable each year -Cannot be moved -Agricultural input only	-All land
Labor (blue)	Person-years (py)	-Natural (not man-made) -Reusable each year -Cannot be moved -Used as an input in all sectors	-All workers
Machinery (red)	Horsepower (hp)	-Produced by manufacturing -Reusable each year -Can be moved freely -Used as input in agriculture and services production	-Equipment -Tools -Machines
Gold (yellow)	Ounces (oz)	-Natural (not man-made) -Reusable each year -Can be moved freely	-Gold -Cash (if no inflation)
Energy (white)	kilowatt-hours (kWh)	-Natural (not man-made) -Not reusable; storable -Can be moved freely -Service sector input only	-Electricity -Coal and oil
Agricultural. Goods (beige)	Metric Tons (mt)	-Produced by agriculture -Not reusable but can be stored -Can be moved freely -Manuf. sector input only	-Food for consumption, -Fiber for manuf. sector input
Services (pink)	Units (ut)	-Produced by service sector -Not reusable; not storable -Can be moved -Used only for consumption	-Housing -Transport -Retail Services

Worksheets and Report Forms

The worksheets and report forms are an important element of the simulation. They help to keep track of input use, quantity of outputs produced, and consumption choices, at the individual sector and national levels. There are six different worksheets/report forms that are described below and then summarized in a table on the following page.

Each production sector (agriculture, manufacturing, services) has a specific "production worksheet" to identify what is possible to do in that sector. Each production worksheet includes a table listing production possibilities (all the possible technology choices and the associated output levels). Producers use this information to determine how to use the available resources to produce outputs. Production choices are recorded on the worksheets.

The "consumption worksheet" is filled out by each participant in the game with the exception of the national statistician and the I-TRADE manager. The first part of the worksheet helps participants to add up the total goods and services available for consumption. On the second part of the worksheet participants record their consumption decisions and calculate the balance between consumption available and amount consumed.

The "final accounts worksheet" is filled out by each producer with information from the production worksheet, consumption worksheet, and price information obtained from the national statistician. The final accounts worksheet is used to record own-sector production, consumption and net wealth at the end of each simulation year. This is for personal record keeping, provides useful information for decisions concerning production and consumption decisions in subsequent years, and is used for comparative purposes at the completion of the game.

The "price survey worksheet" is used by the national statistician to record observed market prices. The worksheet explains the procedures necessary to determine average market prices in gold units for agricultural goods, manufactures, and services. The price survey worksheet provides the price data which is necessary for completion of the final accounts worksheet and the national account.

The "national production report" and the "national consumption report" are completed by the national statistician. The national production report combines individual sector information on input use and output levels into a single national report. The national consumption report combines individual sector consumption information into a single national report. The two reports are used together to compile the "national account".

The "national account" is also completed by the national statistician and has several important functions for the president. It serves as a basis for analyzing and evaluating the current state of the economy, provides information on the performance of each sector of the economy, and can be used for country

comparisons of volume of goods and services produced and value of national production.

TABLE 3: WORKSHEETS AND REPORT FORMS

NAME OF WORKSHEET/ REPORT FORM	COMPLETED BY/ GIVEN TO	PURPOSE
Resource Use and Availability Calculator	Kept by producers	For own record-keeping only
Production Worksheets for Agriculture, Services & Manufacturing	From all producers to nat. statistician	-Lists production possibilities for each sector. -Serves as record of production decisions.
Consumption Worksheet	From all participants to nat. statistician	-Helps participants determine consumption possibilities. -Serves as record of consumption decisions.
National Production & Consumption Report	From national statistician to I-TRADE manager	-Compiles production & consumption decisions of each sector in a national total.
Price Survey Worksheet	From national statistician to all participants and the I-TRADE manager	-Used to determine average market prices in gold units for all resources and products
Final Accounts Worksheet	From all participants to nat. statistician	-Records economic value of all activity (i.e. income) and all assets (i.e. wealth) at the end of each year.
National Account Report	From national statistician to I-TRADE manager	-Records economic value of all activity (i.e. income) and all assets (i.e. wealth) at the end of each year.

PARTICIPANTS' ROLES AND RESOURCE ENDOWMENTS

In I-TRADE, as in reality, everyone owns some resources which they can use to participate in the world economy. These resources are inherited from the past, they are your "endowment". The lucky few are born into great wealth. But most people start life with little more than their hands, their heads, perhaps some land, and maybe some manufactured tools or equipment. Your task in the I-TRADE simulation is to take a particular set of resources and turn them into more valuable products for consumption, sale and investment.

The roles played by I-TRADE participants are defined only by the initial endowments they receive. Each role is explained below. In addition to the endowments of labor and other resources listed here, each participant has an initial endowment of gold, which can serve as money (i.e. a medium of exchange and a store of value). Gold is suitable for use as money because the total quantity available is fixed: it never rusts or gets used up, and cannot be manufactured.

Statistician

The national statistician does not have any initial resource endowment, and has no consumption activity--the statistician's only role is to compile national reports. He/she is responsible for collecting production and consumption worksheets from I-TRADE participants, using the Price Survey Worksheet to determine average market prices, compile national production and consumption reports, and compile the national account. These reports may be shown to whomever is interested, but must be given to the I-TRADE manager to keep the simulation moving.

Government

The participant who receives the government's endowment receives only one resource: workers. These employees (and their families) have the same minimum consumption requirement as others, so the president must collect enough tax revenue to feed them. The tasks of these government workers could include maintaining the legislative system, the police and judiciary, national defense, and other core functions.

The government may wish to go beyond this unavoidable role, to make rules or collect taxes from citizens in order to implement other desired policies. For example, the government may decide to restrict trade, or adopt a policy of redistribution of resources among sectors. To implement such a policy the president would need to tax certain sectors and subsidize others. Likewise, the president may want to provide foreign aid to lower-income countries, perhaps to expand the market for its exports.

Trade

Like the government, the trade sector's only resource is its workers. This lack of physical resources means that the trader has no responsibilities during the production season, and can spend the time traveling around the country (or the world) looking for trade opportunities, and making arrangements to buy and sell all kinds of products. Actual trades can occur only after the products are made (i.e. after the production season), but "contracts" can be written at any time.

Manufacturing

The manufacturing sector has the following resource endowments: workers, a set of machines, and an initial endowment of agricultural raw materials sufficient for the first year's production. The participant handling these resources must decide how to use them to best advantage. In I-TRADE, all manufactured products fall into a single category of "manufactured goods", which can be used as inputs in production or consumed directly. Real-world examples of manufactures used as inputs would be tractors, pumps, fertilizer, etc., while manufactures that are used in consumption would be televisions, furniture, soap, etc.

A distinctive feature of manufacturing is the possibility of "economies of scale", so that the level of inputs per unit of output depends in part on the volume of production -- but large-volume production requires large-volume sales. Once the manufactured goods have been produced the industry manager must make decisions about what to do with the outputs (e.g. consume, trade, invest, save).

Agriculture

The agricultural sector's endowments include labor, farmland, and an initial set of manufactured equipment. Again, the participant handling these resources must choose how to use them, in producing agricultural outputs. In I-TRADE, all farm products are combined into a single category. This "food and fiber" output can be used either as inputs in the manufacturing process (e.g. soybeans, cotton, etc.), or can be used directly by consumers.

The farmer has no economies of scale, but does have a choice between labor-intensive, land-intensive, and input-intensive production methods. As with manufacturing, the appropriate mix of inputs depends crucially on the relative scarcity or abundance of each kind of input. Once agricultural outputs have been produced the farm manager must make the decisions of how the sector will use these outputs.

Services

The service sector's resources are labor, an initial set of manufactured equipment, and energy. These can be combined as shown in the service production possibilities chart. In I-TRADE, "services" are defined to include only activities which are used in direct consumption, whereas work which goes into production is counted separately as "labor". Real-world examples of service activities would include sales, building maintenance, haircutting, etc.

What makes the service sector distinctive is mainly that it relies on the use of a nonrenewable resource, "energy". This is the set of fossil fuels (oil, coal and natural gas) which are used for transport, cooking, heating, etc. The service manager must decide how much of this resource to exploit each year. It may be possible to use the resource too quickly -- or too slowly. During the consumption season the service provider makes the decisions for how her/his sector will use the services produced.

HOW TO PLAY THE GAME: ECONOMIC PRINCIPLES AND STRATEGIES

The resources and roles used in I-TRADE capture many of the major issues in economic life. Of course, not all real-life details are included: as you will see, the simulation is complicated enough, with only six different kinds of activity! But playing I-TRADE has many similarities to real-life economics.

In I-TRADE as in reality, each person's economic prospects depend not only on their own endowments and skill (or luck), but also on the economic environment around them. If your neighbors are wealthy, they may pay more for whatever you can sell them. On the other hand, they may also charge more for whatever you wish to buy from them. So each person's options depend on what they have, but also their location. At the end of the I-TRADE simulation, you will have the opportunity to compare your levels of wealth and consumption with those of others in your own country, as well as those with similar initial endowments in other countries.

Each participant's economic role is defined partly by their initial endowments, and partly by their own choices. Your endowment determines which sector you start in: if you are endowed with farmland, you start life as a farm manager! But you may wish to sell your land and move elsewhere, or start another kind of business to supplement your farm income. In I-TRADE you are free to do whatever you like -- but as you will find, not all choices enable you to earn a living.

One key difference between I-TRADE and real life is that, in I-TRADE, each participant is responsible for many people. Your endowment includes not just one pair of hands, but many. It is up to you to find work for all your workers, and to make all the consumption decisions for your people. Each worker from your sector has a minimum consumption requirement of each type of good (agricultural goods, manufactured goods, or services). If you provide less than this minimum, some people may die. If you provide more, workers from your sector will be happy -- and you can be proud of your achievement at the end of the day.

As in real life, there is no physical "need" to consume more than the minimum required for survival. But it may feel good to use a lot of agricultural goods (e.g. eat steak and breadrolls instead of rice and beans), have lots of manufactured

goods (e.g. use a thousand-dollar sound system instead of a ten-dollar radio), and buy lots of services (e.g. live in a big house instead of a small one). These are your own choices: you may prefer that your workers "live simply," consuming only a minimum amount of goods, so that you may invest as much as you can to expand future production. But as you'll see, whatever you choose has long-term consequences for yourself and for others.

To start planning your economic strategy, turn now to your sector's production worksheet and table of input requirements. You may also wish to check out the worksheets and tables for other sectors, in case you would like to try to start other lines of business.

Good luck!

RESOURCE ENDOWMENTS

This table lists the initial endowments for each sector and country. Note that these resource levels are only roughly comparable to those of real life. Actual statistics for "government" and "trade" sectors will not be comparable to these, because they will include activities that are shown here under "services".

Sector & Resource	Units of measure	Abbre-viation	Kenya	China	Brazil	Nether-lands	Japan	United States
Agriculture								
Labor	person-years	(py)	10	200	12	2	8	12
Population	capita	(cap)	50	600	48	4	16	24
Land	hectares	(ha)	75	400	150	10	40	300
Machinery	horsepower	(hp)	50	1000	300	100	400	360
Gold	ounces	(oz)	5	100	24	5	50	100
Manufacturing								
Labor	person-years	(py)	2	50	12	5	20	40
Population	capita	(cap)	8	125	42	10	40	80
Ag. Goods	tonnes	(ton)	3	10	15	10	40	100
Gold	ounces	(oz)	2	40	30	12	150	300
Services								
Labor	person-years	(py)	4	50	25	5	20	50
Population	capita	(cap)	18	125	75	10	40	100
Energy	kilowatt-hours	(kWh)	40	200	100	100	60	200
Machinery	horsepower	(hp)	6	60	10	10	60	100
Gold	ounces	(oz)	4	100	50	30	250	800
Trade								
Labor	person-years	(py)	1	10	2	1	2	3
Population	capita	(cap)	4	25	6	2	4	6
Gold	ounces	(oz)	2	15	6	15	25	30
Government								
Labor	person-years	(py)	2	30	2	2	5	8
Population	capita	(cap)	4	75	6	4	10	16
Gold	ounces	(oz)	4	50	8	30	60	150
National total								
Labor	person-years	(py)	19	340	53	15	55	113
Population	capita	(cap)	84	950	177	30	110	226

NAME:_____ COUNTRY: _____
INITIAL SECTOR: _____ YEAR _____

RESOURCE USE AND AVAILABILITY CALCULATION SHEET

This sheet allows you to keep track of your resource use during the year. Use it to record what you brought forward from the previous year, plus (or minus) what you produced (or used in production) during the "production season", plus (or minus) what you acquired (or sold/used) during the "consumption season". Any deaths of workers should be recorded as labor lost in the consumption season.

Time period	**Labor** (py)	**Land** (ha)	**Machinery** (hp)	**Energy** (kWh)	**Ag. Goods** (tons)
Start of year quantity brought forward from previous year					
Production Season + quantity produced or - quantity used up					
Mid-year = quantity available					
Consumption Season + quantity acquired or - quantity sold/used					
End of year = quantity brought forward to next year					

NAME:_____ COUNTRY: _____ YEAR:_____

PRODUCTION WORKSHEET FOR AGRICULTURE

Table of production options (to make 20 tons of agricultural goods)

Option	Description	Land Used (ha)	Labor Used (py)	Mach. Used (hp)
A	most labor-using	10	3	20
B	most machine-saving	15	2	10
C	interm. land-saving	5	2	30
D	most land-using	25	1	20
E	interm. labor-saving	15	1	30
F	most machine-using	5	1	50

Each option represents one way to produce 20 tons of ag. goods. You need to decide how much of which technique or set of techniques is most appropriate for your resources and market opportunities. **Each technique can be used any number of times, and you can use fractions (e.g. ½ of technique A, or 5.2 times technique C).** When you have made your selections, enter them in the blank table below. On the last row of the table, calculate the total amount of ag. goods produced and the totals of each resource used.

Worksheet for production decisions

Option Label	No. of times used	Ag. goods produced (tons)	Total Land Used (ha)	Total Labor Used (py)	Total Mach. Used (hp)
A	_____	**x 20 =** _____	**x 10 =** _____	**x 3 =** _____	**x 20 =** _____
B	_____	**x 20 =** _____	**x 15 =** _____	**x 2 =** _____	**x 10 =** _____
C	_____	**x 20 =** _____	**x 5 =** _____	**x 2 =** _____	**x 30 =** _____
D	_____	**x 20 =** _____	**x 25 =** _____	**x 1 =** _____	**x 20 =** _____
E	_____	**x 20 =** _____	**x 15 =** _____	**x 1 =** _____	**x 30 =** _____
F	_____	**x 20 =** _____	**x 5 =** _____	**x 1 =** _____	**x 50 =** _____
TOTALS	_____	_____	_____	_____	_____

Feasibility Check! In the space below, enter this year's "Resources Available" from your "Resource Use and Availability" worksheet, then subtract the total use listed above. The balance should be zero (you used all of your resources) or positive (you have some left over). Remember, unused land and labor are wasted!

RESOURCES AVAILABLE			
- TOTAL USED			
= BALANCE REMAINING			

When you have completed the worksheet, give it to the national statistician. He/she will return it to you by the end of the next period so that you may use it along with the consumption worksheet to complete a final accounts worksheet. This process will be repeated each production "year" and your decisions can change from year to year.

NAME:_____ COUNTRY: _____ YEAR:_____

PRODUCTION WORKSHEET FOR SERVICES

Table of production options (to make 50 units of services)

Option	Description	Labor Used (py)	Energy Used (kWh)	Mach. Used (hp)
A	most labor-using	3	10	2
B	most machine-saving	2	15	1
C	intermed. energy-saving	2	5	3
D	most energy-using	1	25	2
E	intermed. labor-saving	1	15	3
F	most machine-using	1	5	5

Each option represents one way to produce 50 units (ut) of services. You need to decide how much of which technique or set of techniques is most appropriate for your resources and market opportunities. **Each technique can be used any number of times, and you can use fractions (e.g. ½ of technique A, or 5.2 times technique C).** When you have made your selections, enter them in the blank table below. On the last row of the table, calculate the amount of services produced and the totals of each resource used.

Worksheet for production decisions

Option Label	No. of times used	Services provided (units)	Total Labor Used (py)	Total Energy Used (kw)	Total Mach. Used (hp)
A	_____	**x 50 =** _____	**x 3 =** _____	**x 10 =** _____	**x 2 =** _____
B	_____	**x 50 =** _____	**x 2 =** _____	**x 15 =** _____	**x 1 =** _____
C	_____	**x 50 =** _____	**x 2 =** _____	**x 5 =** _____	**x 3 =** _____
D	_____	**x 50 =** _____	**x 1 =** _____	**x 25 =** _____	**x 2 =** _____
E	_____	**x 50 =** _____	**x 1 =** _____	**x 15 =** _____	**x 3 =** _____
F	_____	**x 50 =** _____	**x 1 =** _____	**x 5 =** _____	**x 5 =** _____
TOTALS	_____	_____	_____	_____	_____

Feasibility Check! In the space below, enter this year's "Resources Available" from your "Resource Use and Availability" worksheet, then subtract the total use listed above. The balance should be zero (you used all of your resources) or positive (you have some left over). Remember, unused labor and machinery is wasted!

	RESOURCES AVAILABLE			
-	**TOTAL USED**			
=	**BALANCE REMAINING**			

When you have completed the worksheet, give it to the national statistician. He/she will return it to you by the end of the next period so that you may use it along with the consumption worksheet to complete a final accounts worksheet. This process will be repeated each production "year" and your decisions can change from year to year.

NAME:_____ COUNTRY: _____ YEAR:_____

PRODUCTION WORKSHEET FOR MACHINERY

Table of production options (to produce various size machines)

Option	Description	Size of Machine Produced	Labor Used (py)	Ag. Goods Used (tons)
A	small mach.-labor intensive	5 hp	5	1
B	small mach.-intermediate	5 hp	2	3
C	small mach.-labor saving	5 hp	1	5
D	med. mach.-labor intensive	25 hp	7	3
E	med. mach.-intermediate	25 hp	5	5
F	med. mach.-labor saving	25 hp	3	7
G	large mach.-labor intensive	50 hp	9	5
H	large mach.-intermediate	50 hp	7	7
I	large mach.-labor saving	50 hp	5	9

Each option represents one way to produce machines. The machines can be small, medium, or large (50, 250, 500 hp). You need to decide which option, or set of options, is most appropriate for your resources and market opportunities. **Each option can be selected as many times as you want, but only in whole numbers (no fractions).** When you have made your selections enter them in the blank table below. On the last row of the table, calculate the total amounts of machinery produced and inputs used.

Worksheet for production decisions

Option Label	No. of times used	Machinery Produced (hp)	Total Labor Used (py)	Total Ag. Goods Used (tons)
A	_____	**x 5 =** ___	**x 5 =** _____	**x 1 =** _____
B	_____	**x 5 =** ___	**x 2 =** _____	**x 3 =** _____
C	_____	**x 5 =** ___	**x 1 =** _____	**x 5 =** _____
D	_____	**x 25 =** ___	**x 7 =** _____	**x 3 =** _____
E	_____	**x 25 =** ___	**x 5 =** _____	**x 5 =** _____
F	_____	**x 25 =** ___	**x 3 =** _____	**x 7 =** _____
G	_____	**x 50 =** ___	**x 9 =** _____	**x 5 =** _____
H	_____	**x 50 =** ___	**x 7 =** _____	**x 7 =** _____
I	_____	**x 50 =** ___	**x 5 =** _____	**x 9 =** _____
TOTALS	_____	___	_____	_____

Feasibility Check! Subtract what you used from the inputs available to you this year. The balance must be zero (if you used all your inputs) or positive--and unused labor is wasted!

	INPUTS AVAILABLE THIS YEAR		
-	**TOTALS FROM ABOVE**		
=	**BALANCE REMAINING**		

When you have completed the worksheet, give it to the national statistician. He/she will return it to you by the end of the next period so that you may use it along with the consumption worksheet to complete a final accounts worksheet. This process will be repeated each production "year" and your decisions can change from year to year.

NAME:_____ COUNTRY: _____
INITIAL SECTOR: _____ YEAR _____

CONSUMPTION WORKSHEET

This worksheet allows you to determine how much of each good you may wish to consume, by keeping track of the flow of goods and services, from savings and income to consumption and investment. To begin, fill in below to indicate the quantity of each item that is available to you, from previous savings or from this year's income. Shaded areas are always zero.

	AG. GOODS (kg)	**MACHINES (hp)**	**SERVICES (units)**	**GOLD (oz)**
SAVINGS (a) (brought forward)				
Production				
- sales or other outflow				
+ purchases or other inflow				
= INCOME (b)				
TOTAL AVAILABLE (a+b) (SAVINGS + INCOME)				

Next, fill in below to indicate how you wish to use what is available to you. Total utilization (c+d) cannot exceed the total availability (a+b), and you must consume at least the minimum levels required for survival (1 unit per person). If too little is available, your population will die until the minimum is reached. Note that services are the only good that cannot be saved or invested.

	AG. GOODS (kg)	**MACHINES (hp)**	**SERVICES (units)**	**GOLD (units)**
Consumption for survival (=population x 1)				
+ other consumption				
= CONSUMPTION **(c)**				
+ INVESTMENT **(d)**				
= TOTAL USE (c+d) (CONSUMPTION + INVESTMENT)				

When you have completed this worksheet, give it to the statistician for the national accounts.

COUNTRY: _____ YEAR:____

NATIONAL STATISTICIAN'S PRODUCTION AND CONSUMPTION REPORT

This form is for use by the national statistician to add up each year's production, consumption and trade, to inform the country's citizens and government . Each entry is drawn from the individual sector's Production Worksheets and Consumption Worksheets. Shaded sections are always zero.

TIME PERIOD	PRODUCT SECTOR	AG GOODS (kg)	MACHINES (hp)	SERVICES (units)	GOLD (units)
Start of Year (Savings brought forward from previous year)	Government	+	+		+
	Trade sector	+	+		+
	Manufacturing sector	+	+		+
	Agricultural sector	+	+		+
	Service sector	+	+		+
	National total				
Production Season (Amounts produced or used up as inputs)	Government				
	Trade sector				
	Manufacturing sector	-	+		
	Agricultural sector	+			
	Service sector			+	
	National total				
Consumption Season (Amounts acquired or consumed, sold, etc.)	Government				
	Trade sector				
	Manufacturing sector				
	Agricultural sector				
	Service sector				
	National total				
End of Year (Investment brought forward to next year)	Government				
	Trade sector				
	Manufacturing sector				
	Agricultural sector				
	Service sector				
	National total				

NOTE: Use "+" to indicate *increases* (from production, purchase, etc.) and "-" to show *decreases* (from consumption, sales, etc.).

COUNTRY:_____ YEAR:_____

NATIONAL STATISTICIAN'S PRICE SURVEY WORKSHEET

(*See attached instructions)*

	Item "bought" in the transaction (numerator of the ratio)							**Est. gold-equiv. price**
Item sold	**Ag Goods (tons)**	**Mach-inery (hp)**	**Services (units)**	**Labor (py)**	**Land (ha)**	**Energy (kWh)**	**Gold (oz)**	
Ag. Goods (tons) Ave.		hp/ton	units/ton	py/ton	ha/ton	kWh/ton	oz/ton	oz/ton
Machi-nery (hp) Ave.	tons/hp		units/hp	py/hp	ha/hp	kWh/hp	oz/hp	oz/hp
Service (units) Ave.	tons/unit	hp/unit		py/unit	ha/unit	kWh/unit	oz/unit	oz/unit
Labor (py) Ave.	tons/py	hp/py	units/py		ha/py	kWh/py	oz/py	oz/py
Land (ha) Ave.	tons/ha	hp/ha	units/ha	py/ha		kWh/ha	oz/ha	oz/ha
Energy (kWh) Ave.	tons/kWh	hp/kWh	units/kWh	py/kWh	ha/kWh		oz/kWh	oz/kWh
Gold (oz) Ave.	tons/oz	hp/oz	units/oz	py/oz	ha/oz	kWh/oz		

NATIONAL STATISTICIAN'S PRICE SURVEY WORKSHEET
INSTRUCTIONS

The price survey worksheet is used to estimate the economic value of each resource or product, indicated in the final column as the "estimated gold-equivalent price" of each item. To do this, enter as many transactions as you can observe, in the corresponding cell of the table, and then calculate the average value for each cell. If you have too many entries to fit in a particular cell, use additional worksheets.

At the very minimum you will need to observe at least one "sale" or "purchase" involving each type of item, including gold. If you have been able to observe more than one entry in each cell, compute the average value of that cell, by adding up the numerators and denominators of each ratio (as if it were one large transaction) and then completing the division to obtain the ratio's decimal value.

Once you have at least one "price ratio" involving each good, you can use them to obtain gold-equivalent prices for all of the items. Suppose your survey results in the following figures:

Transaction 1: 100 units services for 25 oz of gold (100/25 = 4 units/oz)
Transaction 2: 300 tons ag. goods for 50 units services (300/50 = 6 tons/unit)
Transaction 3: 50 hp machines for 1000 tons ag. goods (50/1000 = 0.05 hp/ton)

You can use these numbers to obtain the gold-equivalent price of each good, by multiplying or dividing them until their units cancel out to give the desired gold-equivalent price ratio:

Price of services (oz/unit) = 1 / (4 units/oz) = 0.25 oz/unit
Price of ag. goods (oz/ton) = 1 / (4 units/oz x 6 tons/unit) = 1 / 24 = 0.0417 oz/ton
Price of machines (oz/hp) = 1 / (0.05 hp/ton x 24 tons/oz) = 1 / 1.2 = 0.833 oz/hp

You can keep multiplying or dividing the average prices together, cancelling and rearranging the units as needed until you obtain a ratio of oz. of gold per unit of each item.

The prices you observe may not be consistent with each other. For example, the average of the top-right cell (ounces of gold per ton of ag. goods) may be 0.1 while the average of the bottom-left cell (tons of ag. goods per ounce of gold) may be 15. You will have to choose which price observations you consider to be the most reliable measure, typically because it involves the largest trades.

NAME:_____ COUNTRY: _____
INITIAL SECTOR: _____ YEAR _____

INDIVIDUAL PARTICIPANT'S FINAL ACCOUNTS WORKSHEET

Use this form to calculate the market value of your initial assets at the start of the year, and of your annual activity during the year, using the quantities reported on each year's Consumption Worksheet and the average prices for each item in terms of gold, as calculated by your national statistician.

ITEM	**AVG. PRICE FOR THE YEAR**	INITIAL ASSETS		GAINS/LOSSES (+/-)	
		TOTAL QTY.	**MARKET VALUE** (in oz. of gold)	**TOTAL QTY.**	**MARKET VALUE** (in oz. of gold)
Ag. Goods	oz/kg	kg		kg	
Machinery	oz/hp	hp		hp	
Services	oz/unit	units		units	
Labor	oz/py	py		py	
Land	oz/ha	ha		ha	
Energy	oz/kWh	kWh		kWh	
Gold		oz		oz	
TOTAL					

NAME:_____ COUNTRY: _____ YEAR: _____

NATIONAL STATISTICIAN'S NATIONAL ACCOUNTS WORKSHEET

Use this form to calculate the market value of your country's total assets at the start of the year, and annual activity during the year, by adding up the quantities reported on each individual's Final Accounts Worksheet.

ITEM	AVG. PRICE FOR THE YEAR	INITIAL ASSETS		GAINS/LOSSES (+/-)	
		TOTAL QTY.	**MARKET VALUE** (in oz. of gold)	**TOTAL QTY.**	**MARKET VALUE** (in oz. of gold)
Ag. Goods	oz/kg	kg		kg	
Machinery	oz/hp	hp		hp	
Services	oz/unit	units		units	
Labor	oz/py	py		py	
Land	oz/ha	ha		ha	
Energy	oz/kWh	kWh		kWh	
Gold		oz		oz	
TOTAL					

I-TRADE Participant Evaluation

1. What resources did you "inherit" at the start of the exercise? (please circle one)
Country: Brazil, China, Japan, Kenya, Netherlands, United States
Sector: Government, Trade, Services, Manufacturing, Agriculture, Statistician

2. Please rate I-TRADE's overall value to you on a scale from 0 to 10
(0=worthless, 10=extremely valuable) _____

3. Please rate how successful you felt this exercise was in meeting the following specific objectives, by circling the appropriate number:

	Very Successful	Somewhat Successful	Not Successful	No Opinion
Learning how the world economy really works	2	1	0	N
Learning how economics relates to the real world	2	1	0	N
Building my ability to learn and solve new problems	2	1	0	N
Building my ability to communicate & work in a team	2	1	0	N

4. Please describe what you felt was *the best thing* about I-TRADE, which should definitely be kept in future years:

5. Please describe what you felt was *the worst thing* about I-TRADE, which should definitely be changed in future years:

Please make other suggestions to help improve I-TRADE, in the space below or on the back of this sheet. Thank you!