Divine Right Macro Economic System V2

# Resources

Resources to be tracked are as follows. Each category acts as a direct substitution

## Food – Used as Upkeep

Wheat  
Fish  
Meat

## Building Materials – Used as Upkeep and to Make Buildings

Wood  
Stone  
Clay?

## Other

Metal – Used to make soldiers

Horses – Used to make soldiers

Gold – Not sure about this. Either direct substitute for gold, or for making special buildings (such as palaces and temples)

# Settlements and Sites

Settlements will project a 'harvestable' area depending on their population. All tiles within the harvestable area will be automatically harvested. When the settlement gets enough extra manpower it will expand to 'capture' a new tile.

Each tile in it's base state will produce an amount of resources depending on it's biome. The town may 'improve' tiles to make them produce more of a particular resource (and less of another). The town may also convert some tiles into other tiles (forests into grassland mostly).

Certain 'special locations' have more (or only) resources of a particular type. These constitute a site and will give quite a lot of resources (relative to a raw tile).

Each settlement also has a number of buildings. Each building has up to three levels and each level:

1. Might increase the efficiency of harvesting a particular type of resource
2. Increases the amount of upkeep needing to be paid to keep the building running
3. Needs to be built using resources
4. Might increase the population
5. Might increase the amount of 'tax' paid to the city (but doesn't count as population) (mechanics todo later)
6. Other buildings host armies, and increase stability (both mechanics todo later)

Each upgrade of a building increases the upkeep requirements exponentially, and the bonus increases logarithmically

# The Tick

Every month an economic tick takes place. The following steps take place, and the following rules are observed

* Always choose the cheapest price for trading (no political concerns just yet)
* Upkeep always gets first priority. If the city can't pay it's upkeep bad things will happen
* The settlement will try to keep a stockpile of a particular fixed value (say 50 units) – anything more than that and it tries to sell, anything less than that and it tries to buy. Having a ton of money is no problem at all.
* The settlement should remember (?) prices and hold off buying when the price is relatively high (this is going to be hard to implement)
* Trading includes a fixed cost based on distance and another fixed cost if not if the same civilisation

The tick takes the following steps:

1. If you have no prices, start them all at an equal amount
2. Harvest Resources auto-magically from the harvesting zone
3. Look at the Upkeep and pay it off from the stockpile (allow stockpile to go negative)
4. Look at the items in the stockpile and try to balance things out. Only buy if they are within your max-buy price and only sell if it is higher than your min-sell price.
5. If the stockpile has turned negative, buy regardless of price.
6. If your stockpile is still negative, then problems (TM) will happen (todo later)
7. If you are currently building something – take resources as needed for the construction – this can be done in gentle steps to prevent the local economy from going crazy
8. Do the whole update-stockpile thing-via trading again.
9. Look at the amount of items in the stockpile. Reduce or increase the max-buy/min-sell prices by the percentage point amounts of surplus or negatives there are.

When deciding on what improvements to build – the AI will look at the current prices they have and get what gives them the best bang for their buck.

The idea is to run the simulation for a few years before the game starts to build the town itself. Buildings should only be unlocked after prices have somewhat stabilised.

# Trading

* The stockpile has a limited amount of possible total for each CATEGORY of resources. Anything going over that limit is lost (and as you reach the limit, the price should drop very highly)
* Settlements will not sell an amount which pushes them below the fixed stockpile vlues

# Building

A new building may be started ever year. The decision for building will work as follows:

* 1. Look at the average prices of each material over the past year[1]
  2. Calculate the benefits vs cost – using the average prices – over a future 10 year period [1]
  3. Pick the most beneficial[2]
  4. Each month the village will have to pay a fixed part of the cost (so building can stall if they take too long)
  5. If the price appears to be falling – they will prefer to take from the stockpile. If the price appears to be rising, buy it

[1]Depending on the character of the NPC mayor, take shorter or longer periods (instance vs deferred gratification)

[2]Depending on the skill of the NPC mayor, might only consider a sample

# Pending Issues

* Resources might end up being too common – military might be a good money/resource sink
* This economic method is pretty zero-sum – so a village which does well might crush a smaller one