

***Pointing out the expected price
and cost impacts on consumers
and producers from
implementing water
privatization under conditions of
income insecurity and scarcity***

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Abstract

There are price and cost impacts on consumers and producers when public water systems are privatized, especially when done under income insecurity; and these impacts are magnified when there are water scarcity shocks due to natural causes (e.g. low rainfall) or man-made causes (e.g. industrial contamination of water sources). As producers have the ability to pass extra-costs through higher prices, poor consumers are in a situation now that raises issues of food security and water security in the long-term as they face higher prices for food and higher fees to access water under privatization than under a public access system. One of the main goals of this paper is to highlight the expected price and cost impacts on consumers and producers resulting from implementing privatization systems under conditions of income insecurity and scarcity.

1. Introduction

Access to food and access to water are basic needs in developing countries, which fall within Millennium Development Goals number 1 and number 7 respectively (UN 2006); and meeting these basic needs becomes more difficult as poverty levels worsen. There is an understanding that hunger and poverty are associated very closely (Short 2001); and hence, we should expect too that access to water is also tightly connected to poverty. And helping developing countries to meet their basic needs are international institutions like the World Bank and the Food and Agriculture Organization.

Below there is a short overview of the role played by international institutions in developing countries; of the need for these institutions to coordinate development action; of the key role water plays in food markets; and of the need to understand the impacts resulting from the implementation of similar policies such as privatization both in developing country's and in develop country's conditions.

a) The role of the World Bank (WB)

It can be said that the role of the World Bank in rural development is to support the demand side of markets as its main development goal is to eradicate poverty and therefore, to achieve income security. The World Bank's dream is a world without poverty (WB 2005). It is known that income disparities are one of the main issues affecting the demand side of food markets as poor consumers have difficulty meeting their basic needs in existing markets even under good harvests (Short 2001), and this closely links income insecurity with food insecurity.

If we assume that the World Bank can provide sustained income security, then it can be said that all consumers can have access to food markets. For example, the demand side of the market linking water and food under World Bank's income security can be represented as in the top part of Figure 1 below.

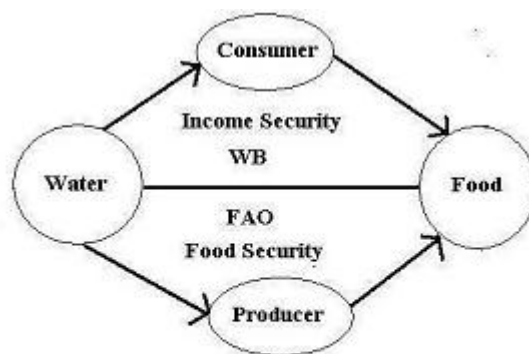


Figure 1 The water based food market model under income security and food security.

The top part of Figure 1 above simple says that when income is not a problem; and therefore, the World Bank (WB) is meeting its goal, all consumers can participate in existing food markets. And once the goal of income security is reached, the role of the World Bank would be to sustain it. The continuous line arrows indicate that consumers have access to water and food; and hence, they are able to meet more than their basic needs if they want.

b) The role of Food and Agriculture Organization (FAO)

It can be said that the role of FAO in rural development is to support the supply side of markets as its main development goal is to attain food security. It is known that with improved technologies and investment poor farmers and industrial farmers can increase their productivity and supply existing food markets. Just recently the EU and FAO reached an agreement aimed at increasing agricultural output (FAO 2009). Having a sustainable food supply is key as now eliminating hunger is a clear priority (UNMP 2005).

If we assume that FAO can provide sustained food security, then it can be said that all producers can supply markets. For example, the supply side of the market linking water and food under FAO's food security can be represented as in the lower part of Figure 1 above.

The lower part of Figure 1 above simple says that when access to technology and investment is not a problem; and therefore, FAO is meeting its goal, all producers can supply existing food markets. And once the goal of food security is achieved, the role of FAO should be to sustain it. The continuous line arrows say that producers can use as much water as they want to produce as much food as they want.

c) The need for inclusive systematic institutional action

Figure 1 above can also be used to highlight the following market sustainability issues linking the role of the World Bank and the role of FAO in developing countries: i) Income security or food security are necessary but not sufficient conditions for market sustainability to exist as the absence of one of them should be expected to lead long-term to the failure of the other. Hence, there is a need for the World Bank and FAO to work together or coordinate actions to ensure market sustainability; and ii) The existence of income security and food security at the same time is the necessary and sufficient condition for market sustainability to take place. In other words, Figure 1 above indicates that if FAO or the World Bank or both do not meet their security goals, the market will be unstable. Therefore, there is a need for both the World Bank and FAO to succeed in their security goals at the same time.

In a speech given by Mr. Robert B. Zoellick, president of the World Bank, at the 2008 Rome World Food Security Summit, he indicated the need for better coordination with other institutions like FAO to arrive to

better development results (WB 2008), an action that according to Figure 1 above must take place in the name of food market sustainability.

d) The key role of water in food markets

Water has a key role in development as it is essential to reaching the millennium development goals (UN 2009). It can be seen clearly in Figure 1 above that water has a central role on the sustainability of that producer-food-consumer system; and therefore, the type of water system (e.g. public, private) and water scarcity (e.g. natural, man-made) have relevant price and cost impacts on consumers and producers. For example, under private water based food markets, especially under scarcity, food prices and water fees should be expected to be higher, but under income security, consumers can still afford to clear the food market; and they can afford the water fees. When there is income security we should expect people to consume beyond basic needs towards over consumption. Gondor (2009) points out that in 2005 the richest 10% of the world population was responsible for 60% of world's private consumption questioning the need to consume beyond the point where more consumption does not mean additional improvements in well-being.

And those price and cost impacts on consumers and producers can be worse if water systems and water scarcity are operating under income insecurity or food insecurity or under both at the same time. For example, under private water based food markets, especially under scarcity, food prices and water fees should again be expected to be higher, but under income insecurity, consumers may not be able to clear neither their basic needs in the food market and in the water market. Mulreany *et. al* (2006) reported that soon after water privatization took place in Cochabamba, Bolivia, water prices went up 43%. And the above discussion raises the latest issue in developing countries besides food security, that of water security.

e) The key role of water in food markets

As mentioned above, developing country's conditions are such that income security and food security are a challenge while the opposite is usually true in developed countries. Therefore, we should expect different impacts and perhaps worse impacts when implementing similar policies such as privatization in developing countries.

Then, questions such as the following become relevant: i) How does the ideal public water based food market in developing countries looks like; and how scarcity affects consumers and producers then?; ii) How does the public water based food market in developing countries looks like under income insecurity; and how scarcity affects consumers and producers then?; iii) How does the private water based food market in developing countries looks like; and how scarcity affects consumers and producers then?; and iv) How does the private water based food market in developed countries looks like; and how scarcity affects consumers and producers then?. And this paper provides answers to the questions above.

II. Objectives

This paper has four general goals: i) To introduced an ideal public water based food market framework in developing countries; and use it to show that under food security and income security consumers have no problems accessing the food and water markets; and producer have no problem supplying the food market, even under scarcity; ii) To indicate that if we assumed that there is income insecurity, then the structure of the public water based food market existing in developing countries can be put together to highlight that producers would have no problem supplying the market, but poor consumers, especially under scarcity, would find it difficult to meet their basic needs of food; iii) To show that the privatization of the public water based food market model under income insecurity, especially under scarcity, affects consumers in two ways, higher food prices and now they have to pay for the water they consume too, making it even less likely that poor consumers would be able to participate in food and water markets at all; and iv) To point out that the privatization of the public water based food market model under full security, even under scarcity, does not

affect consumers access to food and water markets and the capacity of producers to supply the market as consumers can afford the prices for food and water consumption, as it is the case in developed countries.

III. Metodology

First, the terminology used in presenting the ideas in this paper is given. Second, the ideal public water based food market model in developing countries under full security is introduced, without and with scarcity, and the implications to local consumers and producers are highlighted. Third, to reflect developing country's conditions, the public water based food market model under income insecurity is presented, without and with scarcity, and the implications to local consumers and producers are pointed out. Fourth, the private water based food market model under income insecurity reflecting developing country's conditions is discussed, without and with scarcity, and the implications to local consumer and producers are stressed. Fifth, the private water based food market model under full security reflecting conditions in developed countries is shown, without and with scarcity, and the implications to local consumer and producers are mentioned. And finally, relevant specific and general conclusions are listed.

IV. Terminology

Table 1

WB = World Bank	FAO = Food and Agriculture Organization
F = Free water	F = Free water
P1 = Price of food under public water	P = Price of food under public water scarcity
C1 = Cost of water to consumers	C2 = Cost of water to consumers under scarcity
E1 = Cost of water to producers	E2 = Cost of water to producers under scarcity
P2 = Price of food under private water	P3 = Price of food under private water scarcity

Modelling ideal public water based systems

a) The ideal public water based food market model under full security in developing countries

When there is income security and food security at the same time, we have the ideal public water based food market model in developing countries as indicated in Figure 2 below:

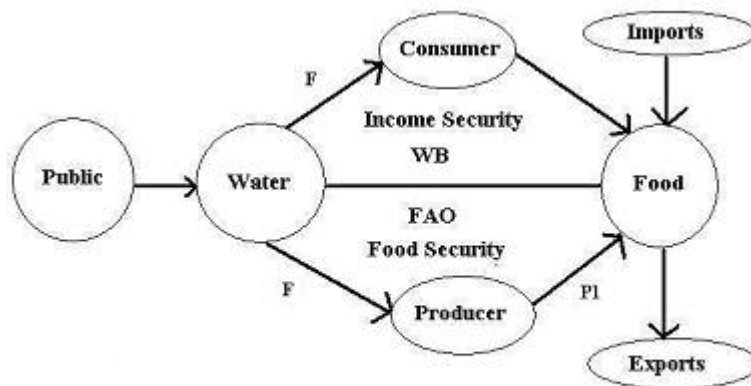


Figure 2 The ideal public water based food market model under full security

ii) Implications to producers

The lower part of Figure 2 above indicates that local producers use free water (F) to produce food and supply the food market, local and non-local, at price P1.

ii) Implications to consumers

The upper part of Figure 2 shows that local consumers under income security have no problem accessing the food market at price P1; and they have no problem accessing free water (F) as shown by the continuous line arrow.

iii) Implications to international institutions

There are no issues of food security and water security in the ideal model above; and the role of the World Bank and of FAO would be to sustain income security and food security, respectively.

b) Scarcity in the ideal public water based food market model under full security in developing countries

Figure 3 below displays how water scarcity impact consumers and producers in the ideal public water based food market in developing countries:

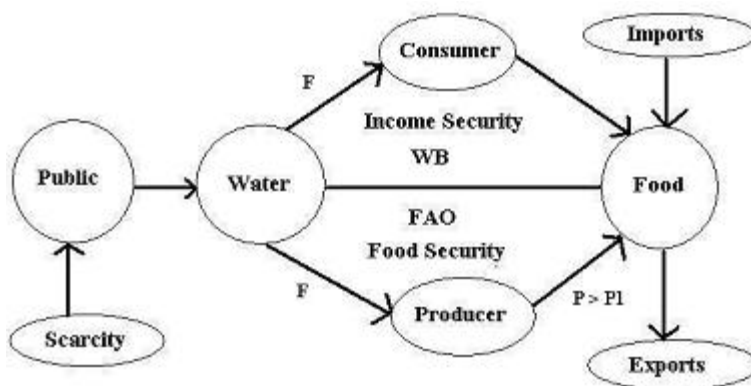


Figure 3 Scarcity in the ideal public water based food market under full security

i) Implications to producers

The lower part of Figure 3 above indicates that local producers use or have less free water available to produce food, but less water means less production and higher prices; and they now supply the food market, local and non-local, at a higher price $P > P1$

ii) Implications to consumers

The upper part of Figure 3 says that local consumers under income security have no problem accessing the food market at a higher price $P > P1$; and they still have access to free water (F) as indicated by the continuous line arrow.

iii) Implications to international institutions

There are no issues of food security and water security in the ideal model under scarcity above; and again the role of the World Bank and of FAO would be to continue to sustain income security and food security, respectively.

Modelling public water based systems in developing countries

a) The public water based food market model under income insecurity in developing countries

As mentioned in the introduction, in developing countries there is insecurity of income and/or food. For presentation purposes here, we will assume that developing countries are food secured and income insecure as shown in Figure 4 below:

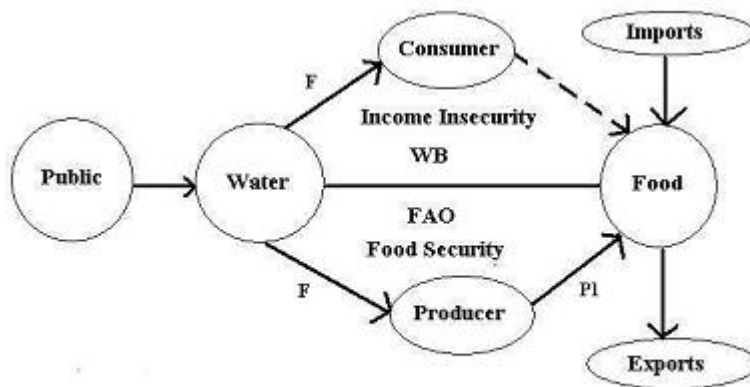


Figure 4 The public water based food market model in developing countries

i) Implications to producers

The lower part of Figure 4 above says that local producers use free water (F) to produce food and supply the food market, local and non-local, at price $P1$

ii) Implications to consumers

The upper part of Figure 4 above shows that local consumers under income insecurity are having problems accessing the food market at price $P1$ as indicated by the broken line arrow, but they are not having problems accessing as much water (F) as they need as shown by the continuous line arrow.

iii) Implications to international institutions

There are no issues of water security in the public water based model under income insecurity above; but in the long-term we should expect issues related to food insecurity. Income insecurity means that the World Bank has not met its goal yet, and this long-term will negatively affect FAO's ability to sustain food security.

b) Scarcity in the public water based food market model in developing countries

Figure 5 below displays how water scarcity impact consumers and producers in the public water based food market under income insecurity in developing countries:

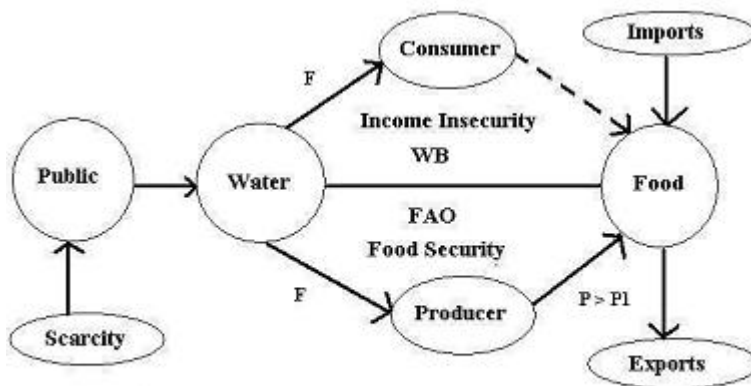


Figure 5 Scarcity in the public water based food market model in developing countries

i) Implications to producers

The lower part of Figure 5 above points out that that local producers use or have less free water (F) available to produce food; and less water is available means less production and higher prices, and now they supply the food market, local and non-local, at a higher price $P > P1$.

ii) Implications to consumers

The upper part of Figure 5 above says that local consumers under income insecurity are having even more difficulty accessing the food market at a higher price $P > P1$ as indicated by the broken line arrow, but they are still able to access some free water (F) as shown by the continuous line arrow.

iii) Implications to international institutions

There are no issues of water security in the public water based model under income insecurity and scarcity above as indicated by the continuous line arrow; but in the long-term we should expect more pressing issues related to food insecurity as shown by the broken line arrow. Income insecurity under scarcity means again that the World Bank has not met its goal yet, and consumers are facing even higher food prices, which long-term will even more negatively affect FAO's ability to sustain food security.

Modelling private water based systems in developing countries

a) Privatizing the public water based market model in developing countries

Figure 6 below shows how the private water based food market model looks like when implemented water privatization under income insecurity in developing countries:

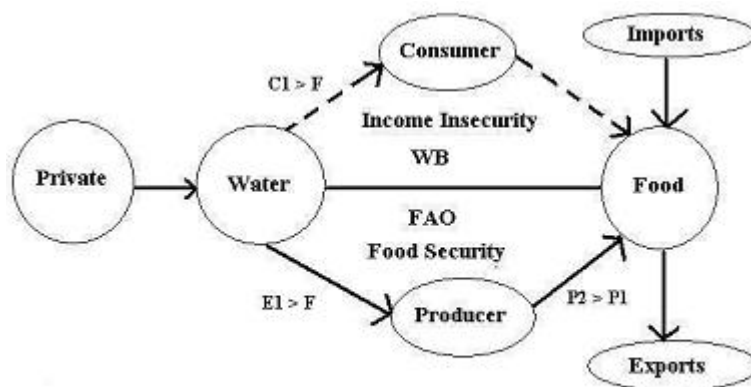


Figure 6 The private water based food market model under income insecurity

i) Implications to producers

The lower part of Figure 6 above highlights that local producers are using as much water as needed at cost $E1 > F$ to produce food at a higher cost; and they supply the local and non-local food market at a higher price $P2 > P1$. Producers simply pass the extra water cost to consumers through price increases.

ii) Implications to consumers

The upper part of Figure 6 says that consumers who were already having difficulties accessing the market at price $P1$ in the public water system due to income insecurity now are facing a higher price $P2$ for food while at the same time they are incurring now the cost $C1 > F$ for water that was previously free, which is reflected by the broken line arrows.

iii) Implications to international institutions

The broken line arrows in Figure 6 above indicate that consumers are having difficulty meeting their basic needs of food and water when privatizing under income insecurity raising issues in the long-term about food security and water security. In other words, privatizing under income insecurity will make the FAO's goal of food security unsustainable in the long term and it will bring issues of water security. The World Bank will have to work harder to bring about income security under water privatization..

b) Scarcity in the private water based food market model in developing countries

Figure 7 below displays how water scarcity impact consumers and producers in the private water based food market under income insecurity in developing countries:

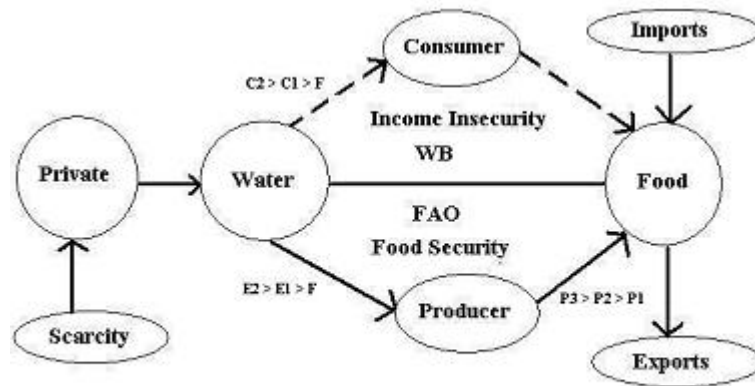


Figure 7 Scarcity in the private water based food market model under income insecurity

i) Implications to producers

The lower part of Figure 7 above states under water scarcity that local producers have less water available or have to use water at a higher cost $E2 > E1 > F$ to produce food at even higher prices; and they supply the local and non-local food market now at even a higher price $P3 > P2 > P1$. Producers simply pass the extra cost of production to consumers through higher prices.

ii) Implications to consumers

The upper part of Figure 7 indicates that now consumers who were before having difficulties accessing the food market at price $P1$ and at price $P2$ are at this moment facing even a higher price $P3$ for food while at the same time they are incurring a higher cost $C2 > C1 > F$ for water that was previously free.

iii) Implications to international institutions

Hence, the broken line arrows in Figure 7 above indicate that consumers are having even more difficulty meeting their basic needs of food and water when privatizing under income insecurity and scarcity, raising more pressing issues in the long-term about food security and water security. In other words, privatizing under income insecurity and scarcity will make the FAO's goal of food security even more unsustainable in the long term and it will bring extreme issues of water security. The World Bank will have to work even harder to bring about income security under water privatization and scarcity.

Modelling private water based systems in developed countries

a) Privatizing the public water based market model in developed countries

As income security and food securities are not issues in developed countries, then the private water based food market model in developed countries can be represented as follows:

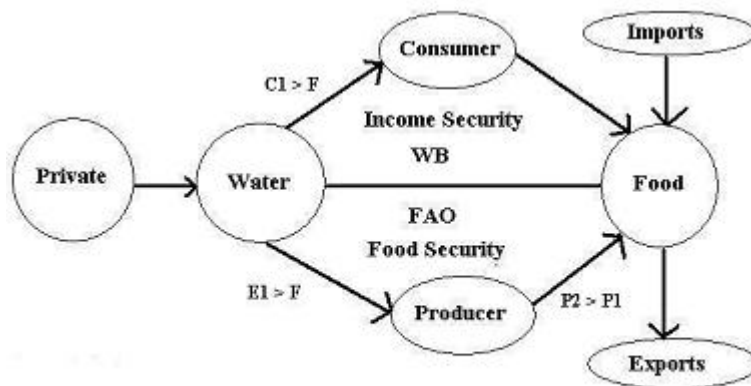


Figure 8 The private water based food market model under full security

i) Implications to producers

The lower part of Figure 8 above shows that local producers are using water at cost $E1 > F$ to produce food at a higher cost; and supply the local and non-local food market at a higher price $P2 > P1$. Producers simply pass the extra cost to consumers through higher prices.

ii) Implications to consumers

The upper part of Figure 8 above indicates under income security consumers who had no problem accessing the food market at price $P1$, still have no problem facing a higher price $P2$ for food and they have no problem with paying for water at cost $C1 > F$. Under income security, there are no threats to food security and water security as they can afford any costs passed by producers to them.

iii) Implications to international institutions

The continuous line arrows in Figure 8 above indicate that under income security, privatization does not raise issues of food security and water security; and therefore, the presence of the World Bank and FAO in developed countries is irrelevant.

b) Scarcity in the private water based food market model in developed countries

Figure 9 below displays how water scarcity impact consumers and producers in the private water based food market under income security in developed countries:

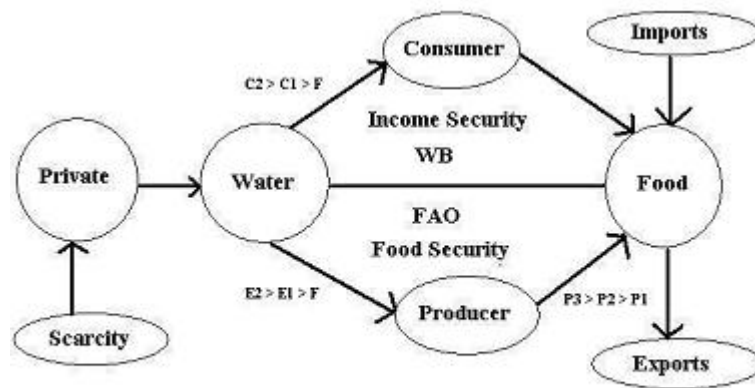


Figure 9 Scarcity in the private water based food market model under full security

i) Implications to producers

The lower part of Figure 9 above indicates that under water scarcity local producers have less water available or are using water at a higher cost $E2 > E1 > F$ to produce food even at a higher price; and they supply the local and non-local food market at a higher price $P3 > P2 > P1$. Again, producers just pass the extra cost to consumers through a higher price.

ii) Implications to consumers

The upper part of Figure 9 shows that under income security consumers who had no problem accessing the food market at price $P1$ and $P2$ can afford the price $P3$ and they can afford a higher cost for water at cost $C2 > C1 > F$. Again, under income security there are no issues of food security and water security as then consumers have the budget to access the food and water market.

iii) Implications to international institutions

The continuous line arrows in Figure 9 above indicate that under income security, privatization, even under scarcity, does not raise issues of food security and water security; and therefore, the presence of the World Bank and FAO in developed countries again is irrelevant.

V. Specific conclusions

First, it was shown that whether water is free or not, producers are always able to supply the food market as they can pass any extra-cost of production, if there are, to consumers through higher prices. Second, it was indicated that public water based systems operating under income insecurity lead to issues of food security in the long-term especially under water scarcity as more of an already limited income is needed to be directed to be able to access the food market. Third, it was pointed out that private water based systems operating under income insecurity lead to both issues of food security and issues of water security at the same time in the long-term especially under water scarcity as more and more of an already limited income is needed to be able to access the food market and the water market. And finally, it was highlighted that private water based systems operating under income security, even under water scarcity, are not expected to lead to food insecurity and water insecurity as they have the income needed to clear the food market regardless of prices; and to access the water market regardless of water costs.

VII. General conclusions

Public water based market systems should be expected to lead to issues of food security in the long-term, especially under water scarcity, when operating under income insecurity. Private water based market systems should be expected to lead to issues of food security and water security in the long-term, especially under scarcity, when implemented under income insecurity. And private water based market systems should be expected not to lead to issues of food security and water security, even under water scarcity, when working under income security as it is the case in developed countries.

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