



Framework for Conducting a Policy Review on Agricultural Water Productivity

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Water Productivity Improvement in Practice

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Executive Summary

Agricultural water productivity receives increasing attention, especially in the context of increasing water scarcity and competing water users from agriculture and other economic sectors. Whereas different understandings exist how water productivity should be linked to national and regional policies, little research has been conducted that empirically reviews these policies. To address that gap, this report presents a framework to conduct a policy review on agricultural water productivity and assess its implications for national development objectives. The method consists of 10 steps that guide a policy analyst from preparation to analysis, validation and policy influence. The method was developed and applied while generating policy reviews for Egypt and Jordan. From these reviews, practical insights are given for each step of the policy review framework. Strengths of the framework relate to a quick and comprehensive understanding of the role of water in the development agendas of a country, and how that may change over time. A way forward is to link the policy review to biophysical impacts using the FAO portal to monitor Water Productivity through Open access of Remotely sensed derived data (WaPOR), to examine past increases or decreases in evapotranspiration (a measure for water use) or biomass (a measure for agricultural production).

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Acronyms

ET	evapotranspiration
WaPOR	Water Productivity through Open access of Remotely sensed data

1 The role of policies for productive water use

Linkages between water productivity and policy have been a topic of debate for many years in the field of water management, and there is not one broadly shared interpretation how water productivity should be included and supported by policies. This report contributes to the on-going debate, not by offering another recommendation how water productivity could be addressed in policies, but by sharing a framework to conduct a policy review on water productivity. Specifically, the scope of the framework is on agricultural water productivity and implications for national development objectives. The focus of the policy review framework is thus to understand how water is going to be used in agriculture in the context of increasing competition from other economic sectors and how the concept of water productivity is included in national water and agricultural policies.

Before the framework is further introduced, we provide a brief overview with different viewpoints on how water productivity is, or could be, linked to policy. Amarasinghe and Smakhtin (2014) conclude that maximising water productivity as bland policy recommendations is not helpful, as this may disregard variations in agro-climatic conditions and agricultural water use patterns within a country. However, they do conclude that increasing water productivity can bring increased socioeconomic and environmental benefits to many water-stressed regions. Their article contains two relevant recommendations for policy in different agro-climatic-water use conditions. First, in arid rainfed areas (or other areas with low irrigation intensity), it makes sense to maximize crop water productivity using small supplemental quantities of water (either through deficit irrigation or increased water holding capacity of soils) during critical periods of crop growth. This can maximize water productivity, but also increases financial and social benefits. Second, in regions with much irrigation, increasing economic water productivity is meaningful as cultivation of higher-value crops (or reallocating water to other sectors) can bring increased socioeconomic and environmental benefits.

Wichelns (2014) argues that water productivity numbers do not enhance the understanding of farm-level water management in rainfed and irrigated settings, as water is one of many inputs that interact with each other. Guidance for policy makers could thus move beyond water productivity and also include field production settings and interactions of water and other inputs (such as nutrients, sunshine, management efforts, and market opportunities) that influence farmers' decisions. Wichelns' insights resonate with Boelens and Vos (2012), who examined what happens when policy makers universally apply concepts like water productivity and water efficiency. They observed three effects: 1) policies and projects that prioritize large-scale irrigation schemes may be justified by these concepts even if they deprive smallholder farmers of water use rights, 2) interference by national or local-regional authorities with local water management practices may harm livelihood and production strategies, and 3) water users may come to blame themselves for underachieving water productivity and efficiency norms that are established in dominant knowledge power structures that may not take into consideration local-level conditions.

In a very recent background paper on water productivity (WASAG, in prep.), the authors highlight that improving water productivity is not a goal in itself, but part of a series of interventions undertaken to increase agricultural production, reduce agricultural water use, increase farm-level income, and/or alleviate poverty and inequity. Governments and policy makers could therefore identify what they want to achieve through water productivity interventions, while recognizing that objectives may not align with other stakeholders. In addition, they recommend governments and policy makers to be clear in the terminology they use to avoid confusion on water productivity conceptions.

This brief overview shows there is agreement that maximising water productivity should not be the sole goal of policy. Instead, more attention could be given to the different agro-climatic conditions, local water

use strategies, and interactions with other inputs that influence farm-level decisions. Governments and policy makers could be specific about the objectives they pursue (is it agricultural production, reduction in agricultural water use, poverty alleviation), and recognise possible conflicts or trade-offs with other stakeholders and their objectives. A well-known example of this is that most farmers tend to maximise returns from their land (land productivity) instead of returns from their water (water productivity).

A strong call to include improvements in water productivity in policies is made through the UN Sustainable Development Goals. Particularly SDG target 6.4 on water use and scarcity calls all UN member states to increase water-use efficiency over time and measure and report on the productive use of water in all sectors, including agriculture, providing absolute values of the economic water productivity in these sectors.¹ However, it is not clear whether a focus on water productivity is donor driven or whether governments have an intrinsic motivation. Nor is it clear if measures are in place that aim to achieve this especially since there are a number of reasons why it is challenging to increase the biophysical water productivity (further specified in Hellegers et al., in prep).

The aim of this report is to share a framework to conduct a policy review on agricultural water productivity with implications for national development objectives. Policy reviews on water productivity are informative as they will reveal which water productivity objectives are reflected in a country's main policies. Furthermore, conducting reviews is empirically relevant, as most of the scholarly attention goes to reviewing water productivity at field level or before and after (project) interventions, without considering water productivity understandings and goals in national and regional policies. This report explains the framework, while empirical findings of country specific policy reviews will be shared in other reports. The remainder of the report covers the methods of conducting a policy review (Section 2), a description of the framework with methodological insights from applications in Egypt and Jordan (Section 3), a discussion on the strengths and limitations of the method (Section 4), and main conclusions on the framework (Section 5).

2 Policy review framework for water productivity

There are different sorts of policy reviews, each having different goals. These may vary from auditing (if particular functions and policy instruments are in place) to evaluation (what is the quality of the policy, or report whether policies have made sufficient progress in implementation) to discourse analysis (what sort of wording and framing is used to describe problems and strategies). Generally, policy reviews are undertaken using qualitative research methods (e.g., Triple-S, 2013). Policies are reviewed in a systematic procedure that entails finding, selecting, appraising, and synthesising data (words, sentences, figures) contained in documents. The analysis yields data (segments of texts, groups of words), that are then organised into themes and categories, and eventually into a case description (Bowen, 2009).

In this framework for conducting a policy review for agricultural water productivity, we focused on the targets, wording, and framing used to describe various aspects of water productivity, land productivity, water use, and policy objectives. Policy documents were reviewed for specific strategies to increase biophysical water productivity (i.e., producing more yield with the same or less water) and to increase efficiency of irrigation systems (i.e., minimize losses from the system). However, since increasing water

¹ Indicator SDG 6.4.1 ("Change in water-use efficiency over time") measures the financial value produced in terms of GDP by the economy (all sectors) per volume of blue water (water in rivers, lakes and aquifers) abstracted or received. Green water use (water use from rainfall, e.g. rainfed agriculture) is explicitly and purposely excluded. Return flows are also excluded. Note that WaPOR does include green water and accounts for return flows.

productivity in closed or closing basins is about competing uses and trade-offs,² policy documents were also reviewed for their policy objectives to examine what is aspired to be achieved through agricultural and water interventions. For example, if the national strategy of a country is to increase economic growth, exporting high-value crops will increase economic water productivity but may reduce the country's food self-sufficiency. For this reason, it is necessary to assess the development strategies against their own objectives and make such trade-offs explicit. In addition, when water is scarce, water productivity involves trade-offs between economic sectors. Therefore, policy documents were reviewed for targets on water productivity, but also water efficiency gains and contents of policy objectives for agricultural and other economic sectors.

3 A 10-step framework for a policy review on agricultural water productivity

In the WaterPIP Project, we have developed a 10-step framework to review policy documents, with the objective to explore how water productivity (and related aspects) are described in policy documents of a country. The steps are discussed in Table 1 below and can be used by other policy-review analysts.

3.1 Insights from applications of the framework

Although the various steps are rather straightforward, experience has taught us there are many smaller decisions to be made by the analyst in the various steps. Insights from policy review analyses conducted in Egypt and Jordan are elaborated below.

Step 1: After the initial scan of various policy documents, it turned out that a more detailed understanding of the national water and agricultural development strategies was needed. Simply focusing on the concept of water productivity appeared to be too vague. In particular the reviews for Egypt and Jordan explicitly focused on productive water use in relation to main water management and irrigation strategies.

Step 2: The reviewed documents were gathered from online sources and the project team's network. Some of the reviewed documents were not publicly available, which made the final review politically sensitive and difficult in phrasing. Both for the cases of Egypt and Jordan, water policies were more easily available than agricultural policies. This implies that the policy review offers a better understanding of the water sector rather than the agricultural one.

It is interesting to reflect on the period that a policy documents is published. Crises tend to affect official policies. Whether this influence is temporary or permanent, is a big question. For the case of Egypt, the reviewed agricultural policy was published during 2009 following the 2008 world food price crisis, during which Egypt was severely impacted and made the discussion for food self-sufficiency important for the country. The Covid19 crisis might also affect some of water and agricultural policies through disrupted global food chains and a renewed focus on nation states and self-sufficiency.

Step 3: Through the first reading of the gathered documents, an initial understanding of the local context and bigger picture was obtained, ranging from who is responsible for different aspects of water, land, and agricultural management to the current and envisioned state of water management and the main policy objectives. Both in Egypt and Jordan, the most relevant ministries for agricultural water management were the Ministry of Water and the Ministry of Agriculture. Through this step, questions about the responsibilities, goals, targets and framings of the ministries were raised. Also important in this step is the

Table 1: Methodology to conduct a policy review on water productivity

Phase	Step	Considerations for the analyst
Prepare	1	Determine scope of policy review Focus: national policies for water and agriculture; Timeline: policies of the last 20 years, with a higher focus on current strategies with a future vision of 15-20 years; Objectives of policy review: what do the policies say about productive and efficient use of water; Types of policies to be reviewed: national policies of ministries (e.g., agriculture, water, environment).
	2	Collect water and agriculture related policy documents Collection of policy documents from online sources (ministries and organizations involved in water and agriculture sector) and by requesting them through people in our network who have close ties to policy processes (e.g., embassies and senior scientists who are involved in policy formulation and implementation).
Analyse	3	Read and highlight water productivity aspects Highlight key aspects that are important given the objective of the policy review.
	4	Extract main policy targets and objectives Determine the key priorities of the document, and interpretations for productive water use.
	5	Compare across policies Identify changed priorities for agricultural development and water use over time, and synergies and conflicts across different policies.
	6	Triangulate findings with step 5 (Briefly) review scientific literature to triangulate the findings on water and agricultural policies, targets, and objectives.
	7	Summarise main findings Create a draft working document that summarises the main findings of the policy review in a one-page document.
Validate and Complete	8	Validate Share the working document with experts who are familiar with the different policies and their influence on land and water management in the country.
	9	Adjust and complete the review Incorporate the feedback in the working document, and finalise the review into a Policy Review Report.
Policy Influence	10	Decide (and take) next steps Consider next steps how the findings of the review can be used effectively, for instance as input for a policy dialogue between countries or ministries, as discussion piece for policy makers of the same ministry, start of a Twitter campaign or other policy advocacy.

analyst's ability and intuition to see potential differences and information gaps that need to be kept in mind in the upcoming steps.

Step 4: To sharpen the analysis and answer the questions raised in the previous step, the policies of the Ministries of Water and the Ministries of Agriculture were described separately and in detail. Delineating details is necessary in order to later extract the potential synergies and conflicts of the different strategies of the ministries (Step 5).

Step 5: After having the water and agricultural strategies delineated (Step 4), the strategies were compared to find where they align and where they contradict. In the Egyptian policies, it was clear that the two

ministries were both recognizing the importance of efficiency gains for combating water scarcity and the need for food security (i.e., the access for all people at all times to enough food for a healthy, active life). However, the two different policies were not exactly aligned. It was challenging to understand the nuanced differences between the views of the two ministries, considering also the limited availability of agricultural policy document. For the Jordanian policy review, the availability of agricultural policy documents was more limited than that of Egypt. As such, the synergies and contradictions between the Ministry of Water and the Ministry of Agriculture could not be seen first-hand, leading to the following step (Step 6).

Step 6: To better understand and triangulate the synergies and conflicts between the ministries, scientific literature was briefly reviewed. For the Egyptian policy review, scientific literature was used to triangulate the findings of the policy documents while in the Jordanian policy review, scientific literature regarding agricultural policies was used as the main source of information due to limited availability of agricultural policy documents.

In the Egyptian policy review, the national agricultural development strategy was setting targets for food self-sufficiency while also promoting exports. As such, there was uncertainty to what extent export ambitions were in balance with food production ambitions. Moreover, it seemed that the Ministry of Water Resources and Irrigation took a more conservationist approach that advocated for vertical expansion (intensification) of agriculture and possible virtual water trade for water intensive crops. In contrast, the Ministry of Agriculture and Land Reclamation advocated for horizontal expansion of agriculture and land reclamation. This was also confirmed in the literature.

In the Jordanian policy review, the literature pinpointed some points of mis-alignment between the Ministry of Water and the Ministry of Agriculture. The former focuses on the unrestricted use of wastewater and desalination to increase irrigation water while the latter adopted a more hesitant approach towards which crops could be irrigated with wastewater. Additionally, the two ministries seem to focus on different regions for the development of agriculture, following their goals and objectives.

Step 7: To summarise all findings, a one-page document was created. This step requires the analyst to move away from the great complexity of the extended policy review and present the findings in a simple manner. Challenging as this might be, it makes the policy review more accessible and easier to be validated by experts (Step 8).

Step 8-9: After the validation, changes were made according to the insights provided by the experts. In the case of Egypt, the Dutch Embassy in Cairo noted that Ministry of Agriculture and Land Reclamation was not only focusing on horizontal expansion but also working on vertical expansion. As such, the alignment of the policies of the two ministries was much better than initially expected. Further adjusting and expert's feedback is on-going in the case of Egypt and Jordan, hence this step can take a few weeks to months depending on how fast the feedback can be obtained and incorporated.

Step 10: Since the aim of the reviews is to facilitate policy dialogues, it was necessary to adapt the phrasing of the one-pager to reflect collaboration rather than pronounce contradictions between organizations.

4 Discussion

The aim of this report is to share a framework to conduct a policy review on agricultural water productivity with implications for national development objectives. Having applied the framework to policy reviews in Egypt and Jordan, we can reflect upon its strengths, limitations, and identify ways forward for further development.

The framework has a clear number of advantages. First, it provides a quick understanding of the development agendas of the reviewed country. This is crucial in order to make explicit the trade-offs, if any, that are related to specific water productivity and efficiency targets and goals. In this way, the review becomes a lot broader than specific water productivity gains. Second, the influence of the analyst in the policy review is limited through the repeated check of the findings with literature and experts. As in most qualitative research, the analyst depends on intuition to interpret the policy documents. Sometimes intuition might inadvertently lead to wrong conclusions that do not reflect reality. This risk of incorrect conclusions is largely mitigated through the validation and triangulation. Third, through analysing past and current policy documents, tracking changes and new developments becomes possible. Through placing each document in the context of when it was published, additional insights can be obtained. For example, issues of self-sufficiency have obtained a greater importance during times of crises, such as the 2008 world food price crisis. Such food crises can also lead to social uprisings and political instability. Covid19 is another crisis that might influence national policies to become more self-dependent in their food production. In turn, this has impacts on the water use of water poor countries that normally depend on virtual water imports to meet their need for staple foods.

There are also limitations of the method. The focus on national policies neglects regional (sub-national) development targets, or linkages between national and regional-local policies. Depending on the governance scheme of a country, regional policies might significantly influence the implementation of nationally set policies. Additionally, national policy documents might include multiple, and even contradictory, objectives. This might happen because national policies do not always set regional specific policies, and instead some policies are more relevant for certain regions than others. Having several policies with various (abstractly formulated) targets (e.g., more efficient water use) may have multiple functions beyond immediate implementation, for instance to attract donor funding. Furthermore, by focusing on national policies, the framework may miss important issues that are or cannot be written down in a policy as they may be too sensitive to be mentioned (for instance, reduced water flows or foreign private investments in a country's irrigation system).

Another recommendation - in addition to studying national-regional policy linkages - is to broaden the scope from policy review to policy impact review. A policy impact review also looks at impacts of policies (and other factors, as policies are not the only influence in decision making) on the environment. The latter can be done by conducting social economic studies (e.g., social water productivity surveys). Or, insights on biophysical aspects can be provided using the FAO portal to monitor Water Productivity through Open access of Remotely sensed derived data (WaPOR). The WaPOR portal can be utilised in several ways. First, WaPOR can be used to locate the main agricultural production areas in a country and reveal whether they have expanded or decreased in size under particular policies. Second, WaPOR can provide data on evapotranspiration (a measure for water use) and biomass (a measure for agricultural production). ET and biomass data can be gathered over a number of years, which enables a comparison between time periods (e.g., changes ET and agricultural production over time). However, there are limitations to this type of analysis as additional information on cropping patterns and climate are required (e.g. rainfall data is available in WaPOR, but also temperature, and wind would be needed). Third, WaPOR could be used to zoom into a particular region where policies have supported particular developments (e.g., irrigation expansion, maintenance of irrigation systems) and could reveal whether they have led to an increase or decrease in agricultural area, ET, and biomass. It should be noted that WaPOR gives initial estimates for ET and biomass that require careful interpretation and validation with field data.

5 Conclusion

In the context of the WaterPIP Project, understanding how the concept of water productivity is (or is not) adopted in national policies is important. Through this framework, we aim to provide guidance on how to conduct a national policy review on agricultural water productivity and assess the implications for a country's development objectives. We recognize the limitations that such a method has, both in terms of regional (sub-national) development strategies and the various functions that national policies have (such as development for the future and attracting funding). However, this method ensures a quick, rather reliable (as triangulation and validation are key aspects), and holistic approach to policy analysis on agricultural water productivity. By sharing the framework to conduct a policy review, we invite others to conduct similar reviews.

Our experience so far is that the framework generates a complete understanding of different policies and their interpretations of water productivity and water efficiency. Furthermore, a policy review can raise motivations to conduct a policy dialogue between stakeholders. Additionally, such a method is not limiting the debate of water productivity to hard productivity and efficiency gains in agriculture, as water productivity is not a goal by itself. Rather the method facilitates engagement with the water productivity concept across various policies, and seeks ways to link it to agricultural development and other policy objectives in order to improve the wise and sustainable use of increasingly scarce water resources.

6 References

- Amarasinghe, U. A., & Smakhtin, V. (2014). Water productivity and water footprint: misguided concepts or useful tools in water management and policy? *Water International*, 39(7), 1000–1017. <https://doi.org/10.1080/02508060.2015.986631>
- Boelens, R., & Vos, J. (2012). The danger of naturalizing water policy concepts: Water productivity and efficiency discourses from field irrigation to virtual water trade. *Agricultural Water Management*, 108, 16–26. <https://doi.org/10.1016/j.agwat.2011.06.013>
- Bowen, G. A. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal*, 9(2), 27–40. <https://doi.org/10.3316/QRJ0902027>
- Hellegers, P. et al (in preparation). Water productivity gains or doubtful claims?
- Triple-S. (2013). *Qualitative Document Analysis: 'Practice' document review*. Triple S, IRC Wash, Agua Consult. https://www.ircwash.org/sites/default/files/qda_praticedocumentreview_2013.pdf
- WASAG. (n.d.). Can Water Productivity Improvements Save Us from Global Water Scarcity? A Background Paper. *Prepared for the WASAG Workshop "Can Water Productivity Improvements Save Us from Global Water Scarcity?", February 25-26 at CIHEAM BARI in Valenzano, Italy.*
- Wichelns, D. (2014). Do Estimates of Water Productivity Enhance Understanding of Farm-Level Water Management? *Water*, 6(4), 778–795. <https://doi.org/10.3390/w6040778>