ENABLING POLICY ENVIRONMENT: IMPROVING THE IRRIGATION WATER PRODUCTIVITY THROUGH NEW IRRIGATION POLICY IN AFGHANISTAN

Suman Sijapati [1], Masoom Hamdard [2] and Hashmatullah Ghafoori [3]

ABSTRACT

The National Irrigation Policy 2018 is the first documented policy for irrigation in Afghanistan since 1978. Several consultative workshops were conducted with the stakeholders related to the irrigation sector at the regional and central level, and consensus were reached at technical forums such as inter-ministry coordination groups, and technical secretariat of Supreme Council for Land, Water and Environment, before final approval from Cabinet of Ministers in November 2018.

The fact that Afghanistan now has a documented policy is a significant milestone as irrigation remains a priority area with livelihood source of over 80% population depending on agriculture. This policy seeks to (a) fill the policy gap, (b) facilitate and guide interventions in the irrigation sector, and (c) contribute to sustainability and more equitable distribution of benefits across irrigation systems and across agro-environments. It clarifies programmatic priorities of the country's irrigation sector that includes increasing the productive area under irrigation, triggering job creation, increasing domestic agricultural production, reducing food-insecurity, and addressing water shortage as well as problems of salinity and drainage. It is expected to particularly contribute to achieving the SDGs indicators tailored for Afghanistan.

This paper explores the key features of the policy and tries to investigate the extent to which they provide an enabling environment for the water, food and energy nexus in Afghanistan. It analyses the status of the nexus as well as the potential improvements in water productivity due to the prevailing policy measures. It also analyses the arrangements for participation of the stakeholders and resilience against destructive forces of nature. The paper also discusses on the various policy measures put in place and their merits and demerits particularly from the perspective of making a difference at the ground level by enhancing irrigation water productivity.

The paper concludes stating that this policy is well positioned for the current context of Afghanistan. It has filled in the policy gap and well identified the programmatic priorities of the country's irrigation sector. Its implementation,even though moving in the right direction, needs some refinements and coordinated efforts from all stakeholders. Otherwise the set objective cannot be met within the stipulated period. The policy direction of increasing the productivity of irrigated agriculture and the measures proposed for enhancing water productivity are appropriate and have even started to show some positive indications. However, measures must be in place for sustaining the achievements which can be done through local scale institutional arrangements and proper engagement of the concerned Irrigation Associations in the planning, implementation, as well as operation and maintenance of the irrigation schemes.

[1] Chief Technical Advisor in FAO Afghanistan, Nepal, sumansij@yahoo.com

[2] Senior Irrigation Advisor to the Office of the Deputy Minister of Irrigation and Natural Resources, Afghanistan, masoom.hamdard@gmail.com

[3] Deputy Minister of Irrigation and Natural Resources of the Ministry of Agriculture, Irrigation and Livestock of the Islamic Republic of Afghanistan, Afghanistan, h.ghafoori@mail.gov.af

Finally, the paper also provides specific pointers for next most logical steps to materialize the essence of the policy considering the prevailing challenges like poor infrastructure, institutional structure, financing and capacity at different tiers.

Keywords: Irrigation policy, Water-Food-Energy nexus, irrigation water productivity, Afghanistan.

1. INTRODUCTION

Agriculture is the foundation of Afghanistan's economy as 80 % of the population work in agriculture and the sector contributes about 24% of the country's Gross Domestic Product (GDP). Moreover, Afghanistan's climate, topography, land and water resources endowment determines only about 12% of the country's land as arable, out of which only about 6% is irrigable and 4% currently irrigated. The main reason for this low level of irrigation is primarily because of the poor access to water and lack of essential irrigation infrastructure. Hence, it becomes imperative to maintain high levels of water productivity in areas that have access to irrigation. Low crop and water productivity means high levels of rural poverty and stagnant economic growth. Hence, supporting the regulatory framework and improving irrigation and associated agro-technologies is a strong means for bolstering farm incomein Afghanistan.

Realizing its earnest requirement, the Ministry of Agriculture, Irrigation and Livestock (MAIL) took the lead role in developing the National Irrigation Policy. FAO Afghanistan provided the desired technical support. Several consultative workshops were conducted with the irrigation sector stakeholders both at the central level as well as at the regional level. At first, the views of the concerned people at the field level were collected through consultative workshops in the different regions. In this concern, the first consultative workshop was conducted in Mazar-i-Sharif on the 22nd of December 2016. Similarly, the second workshop was successfully conducted in Herat where participants from Herat Region and three provinces of Kandahar Region participated. Likewise, the third consultative workshop was conducted in Kabul on 2nd January 2017 covering Kabul Region and the remaining provinces of Kandahar Region. The final consultative workshop was held in Jalalabad on 5th January 2017 covering the Eastern Region. FAO Afghanistan then supported the ID in compiling all the feedbacks received from different regions. After these workshops at the regional level, the next round of consultation was conducted at the central level to finalize the draft document. This workshop was chaired by the Deputy Minister for Irrigation and Natural Resources also successfully conducted on 27th July 2017.

After a draft document was produced through consultations from various fronts, FAO Afghanistan also provided the inputs of the international policy experts in order the assure that the document is of international standards. The improved document went through the regular process of approval from the government. It was first discussed at the ministry level, then at the intra-ministry level and finally at the Supreme Council for Land, Water and Environment. Feedbacks were collected at each level. The document was then approved by the cabinet on the 7th November 2018 and is now effective.

The promulgation of the National Irrigation Policy 2018 has opened the window of opportunities for significantly uplifting the irrigation sector of Afghanistan. This policy aims not only to fill the policy gap that remained as a void for about four decades but also to facilitate and guide interventions in the irrigation sector of Afghanistan and to contribute to sustainability and more equitable distribution of benefits across irrigation systems and across agro-environments by clarifying the programmatic priorities of the country's irrigation sector.

The policy document took the objective of promoting sound development of Afghanistan's irrigation sector by increasing the productive area under irrigation, triggering job creation, increasing domestic agricultural production, reducing food-insecurity, and addressing water shortage as well as problems of salinity and drainage. These are the needs of the country but the extent to which this document can address these concerns and deliver the requirements needs to be closely examined.

On the other hand, it is also necessary to ensure that the adopted policy is in line with the current trends and ideologies. Traditionally, water, food and energy were considered as separate sectors and separate policies were developed for each generally mandating different ministries for different sectors. Currently, there is a growing consensus that these three should be treated as a nexus. This nexus is important not only to bring together these closely interrelated sectors in one perspective but also to ensure efficient use of the resources and to produce synergy.

Moreover, due to its semi-arid climate and low annual precipitation, water is the main constraining factor to agriculture productive in Afghanistan. Most river basins experience water stress and populations live with an inadequate level of water security, thereby, affecting the food security, energy production and ecological health. Additionally, climate variability and other global and regional factors have further exacerbate the condition of water stress.Water management is rapidly changing as new challenges are emerging under the combined effect of population growth, economic development, rapid rural transformation and climate change.In this context, proper attention to irrigation water productivity is crucial for the country as the desired objectives cannot be met without productive use of available water resources. Hence, it is vital to understand to what extent the new policy facilitates improvements in water productivity.

This paper explores the key features of the policy and tries to investigate the extent to which they provide an enabling environment for the water, food and energy nexus and to make necessary improvements in water productivity. It also analyses the arrangements for participation of the stakeholders and resilience against destructive forces of nature. The paper also discusses on the merits and demerits of the various policy measures. Finally, it draws the overall conclusions and provides specific pointers for next most logical steps to materialize the essence of the policy taking into consideration the prevailing challenges.

2. KEY FEATURES OF THE NATIONAL IRRIGATION POLICY 2018

The National Irrigation Policy has adopted the overall goal of increasing the productivity of irrigated agriculture and the performance of the irrigation sector and has five overarching strategic objectives that are:a) Sound investment framework and modernized irrigation infrastructure;b) An appropriate institutional arrangement at government and community levels;c) Adequate technical capacity across stakeholders;d) Clear legal framework to define the role and responsibilities of the government and communities; and e) Mainstreaming cross-cutting issues.

The policy is expected to particularly contribute to achieving the SDGs indicators tailored for Afghanistan, as well as towards (i) ending poverty (Goal 1); (ii) ending hunger, achieving food security and improve nutrition and promote sustainable agriculture (Goal 2); (iii) ensuring access to water and sanitation for all (Goal 6); (iv) promoting inclusive and sustainable economic growth, employment and decent work for all (Goal 8); (v) building resilient infrastructure, promoting sustainable

industrialization and fostering innovation (Goal 10); and (vi) ensuring sustainable consumption and production patterns (Goal 12).

Overall, the policy is quite concise but comprehensive as it covers all features expected in a policy document. Not only has it clearly stated its goal and objectives, but it has also vividly spelled out its implementation arrangements including its responsibilities, implementation instrument, monitoring, validity and amendments.The document has categorically divided the irrigation systems in Afghanistan into different typology. This distinction has been made on the basis of size of the irrigation system (large, medium or small) as well as on the basis of source type (surface, groundwater or spate) andinstitutional background (formal / inform). It has led to the assignment of the majority (75%) of the irrigation systems under the category of small (less than 100 ha), 23% as medium (101 to 500 ha), and only 2% as large irrigation schemes. Different policy measures have been adopted for different types of irrigation systems.

3. ENABLING ENVIRONMENT FOR THE WATER, FOOD AND ENERGY NEXUS

The basic needs of people of water, food and energy are expected to gradually increase with the increase in population and the enhancement in the quality of life. The processes surrounding the use and production of these needs, even though familiar to humans are actually quite complex. Consorted efforts are required to handle them efficiently. Water is available in different sources, forms and qualities and can be of different potential – mostly useful but at times even harmful (like floods). Similarly, food comprises of different amounts of calories and nutritional compositions. Likewise, energy also has many concerns including greenhouse gas emissions, price, etc.The interdependencies among water, food and energy sectors are numerous, multidimensional and dynamic. Any interventions in one sector generally results in profound social, economic and environmental implications in one or both of the other sectors. In fact, some are of the opinion that security of one cannot be achieved without undermining the other (Lele et al, 2013; Ringler, Bhaduri and Lawford, 2013).

Water is the first sector of the nexus. It functions both as input as well as the output. Water itself is basic commodity without which life cannot survive. It also serves as a key input for the production of both food and energy. Moreover, water also sustains the ecosystems that supports agriculture and other economic activities that are critical for achieving food security (Hellegers et al, 2008; Molden et al, 2007).

Food is the second sector and is generally produced by utilizing water, land, and energy. Agriculture, responsible for growing food, is a major user (more than 70% globally) of water and energy. Agriculture and food production further affect the water sector through land degradation, changes in runoff, and disruption of groundwater discharge (Alauddin and Quiggin, 2008). However, sustainable agricultural practices, save water and energy by increasing water storage in the soil and groundwater recharge and reducing the use of energy-intensive fertilizers.

Energy is the third sector of the nexus. It is required for food production (especially irrigation) and for water supply, including the extraction, purification, and distribution of water (Bach et al, 2012; Bazilian et al, 2011; Mukherji and Shah, 2005).

In this way, the interfaces between the three is quite evident. However, the factors influencing them are not just limited to these interfaces but are also influenced by external factors. External factors like population growth, economic growth and climate change are found to influence this nexus. Population growth has been observed to be the main factor triggering pressure on the local natural resources and consequently the nexus of water, food, and energy. Similarly, economic growth that has boosted

the standard of living and consequently the demand for better quality and/or quantity of commodities like water, food and energy has also been observed to exert further pressure on the nexus. Likewise, the external phenomenon of climate change has also added one more layer of uncertainty to this already complex nexus. Climate change puts pressure on the nexus to reduce vulnerability and adapt resilient measures.

Failure to consider the nexus of water, energy and food in resource assessments and policy making has led to contradictory strategies and inefficient use of resources (Howells et. al., 2013).

In the context of Afghanistan, all three sectors of water, food and energy are under growing pressure primarily due to growing population and enhancement in the quality of life especially in the urban cities like Kabul, Herat, Mazar, etc. The demand for water for domestic uses in these cities has been increasing drastically. Moreover, people are also becoming more conscious of the quality of water. Similarly, their nutritional demand is also in the rise with preference shifting towards high nutritional food. Improvements in the quality of life and more exposure to the outside world has urged the citizens to use electrical and electronic goods like air-conditioner, refridgerator, washing machine, television, etc. Moreover, the shift can also be observed from renewal forms of energy like firewood to more dependable forms of energy like, diesel, gas, etc. Likewise, it is also observed that groundwater extraction has also drastically expanded in recent times some areas of Afghanistan including Kabul. This unplanned groundwater development has resulted in fall of water levels, failure of wells, and even salinity programs in some areas. The combined effect of increase in the number of wells and the lowering of the groundwater table in these areas has resulted in significant increase in energy demand.

Adaptation to climate change is a global priority in countries with high vulnerability, high exposure and coping capacity. Afghanistan's position is exactly like this. Large numbers of its population live in climate-vulnerable mountainous settings and depend on climate-sensitive sectors like agriculture, forestry, and livestock (WRI, 2011).

In this context, there is little doubt that appropriate policy measures in the irrigation sector can result in efficient use of available natural resources particularly, land and water and contribute to produce synergy among water, food and energy sector. The current national irrigation policy of Afghanistan highly emphasizes on rehabilitating, modernizing and expanding irrigated lands, particularly in informal irrigation systems. This, if implemented properly, will play a key role in addressing water scarcity issues, improving water productivity and contribute towards enhanced in food security for the country.The only challenge to this irrigation infrastructure development investment is the mobilization of necessary funds. It may sometimes be too expensive for the poor farmers. Moreover, potential for exports also tends to support those who have access to infrastructure and investment capacity. Hence, the government will have to mobilize its own resources to support the poor farmers.

Due to growing population and unavailability and changing life styles in the rural parts of the country, the population living there have been observed to gradually shift from renewal to dependable forms of energy. This has resulted in increased pressure on the natural resources. The problem is compounded in the mountainous areas where land is steep and fragile. In most of these areas, farming and grazing have been revealed to have been extended even up to marginal areas. In some areas, this intensification of agriculture and land use has even resulted in rapid degradation of land resources and reduction in production potential.

The policy also emphasizes on improving productivity of land and water resources use in irrigated agriculture. This has been envisioned to be achieved through technology transfer, strengthened input support, and research and extension services to (i) increase yields; (ii) reduce post-harvest losses; (iii) create stronger value chains in irrigated agriculture; (iv) improve the reliability and timing of irrigation water supplies; and (v) more efficient use of water. All these are expected to be accomplished by establishing a coherent planning and programming process, raising public awareness and addressing capacity constraints across relevant public and private sector institutions and stakeholders by developing, implementing and promoting standards, specifications, manuals, codes of practices and guidelines and harmonizing the interventions by various sector, both public and private. These measures provide a comprehensive framework and appropriately fit in the direction of producing synergy in the water, food and energy nexus with efficient use of available resources in the country.

The policy also stresses on strengthening the legal and institutional framework, and the capacity of stakeholders. Historically, there are also many incidences of failure of local adaptation measures due to inadequate institutional support (Agrawal, 2010). Hence, this policy measure is more directed towards ensuring sustainability of the achievements made in the water, food and energy nexus through an appropriate institutional support system. It is set on a sound legal foundation guided by provisions under (a) the Constitution of the Islamic Republic of Afghanistan; (b) Statutory Laws, including the Civil Code and the Water Law, and (c) traditional customs and practices.

4. IMPROVEMENTS IN WATER PRODUCTIVITY INAFGHANISTAN

Agricultural growth remains a key contributor for national growth and employment in Afghanistan. It also provides the necessary base for successful structural transformation of the national economy. Most river basins in Afghanistan experience water stress of different levels and the populations survive with an inadequate water security resulting in adversely affects in their food security, health and livelihoods.

The National Irrigation Policy 2018 has clearly stated its overall goal as increasing the productivity of irrigated agriculture and the performance of the irrigation sector. All programmes and projects in the sector have been is expected to be directed towards this overall goal. Hence, most of the on-going projects funded by different donors are trying to improve water use efficiency by educating farmers to adopt High-Efficiency Irrigation Systems (HEIS) and modern agricultural practices.This is expected to result in economic growth and improvements in livelihoods and public welfare.

Some of these projects are also assessing the Crop Water Productivity (CWP) as an impact of the project. In this concern, On-farm Water Management Project funded by the World Bank carried out an assessment of the CWP of a representative sample of five completed rehabilitated irrigation schemes from five regions (Nangarhar, Kabul, Bamiyan, Herat and Mazar-e-Sharif). Irrigation data was collected during each irrigation rotation (turn) and crop yields ofmajor crops of the irrigation scheme was collected at the time of harvest. The CWP was computed for the different irrigation schemes by dividing the total agriculture production by the amount of water supplied from different sources like surface and ground water supply.

The exercise revealed that the crop water productivity of wheat in the different schemes of five regions where the data was collected is on an average 0.94 kg/m3, while the maximum water productivity is 1.40 kg/m3 (Najumddin, 2019). The CWP values for wheat obtained from the different regions as well as the overall average value have been graphically presented in Figure 1.

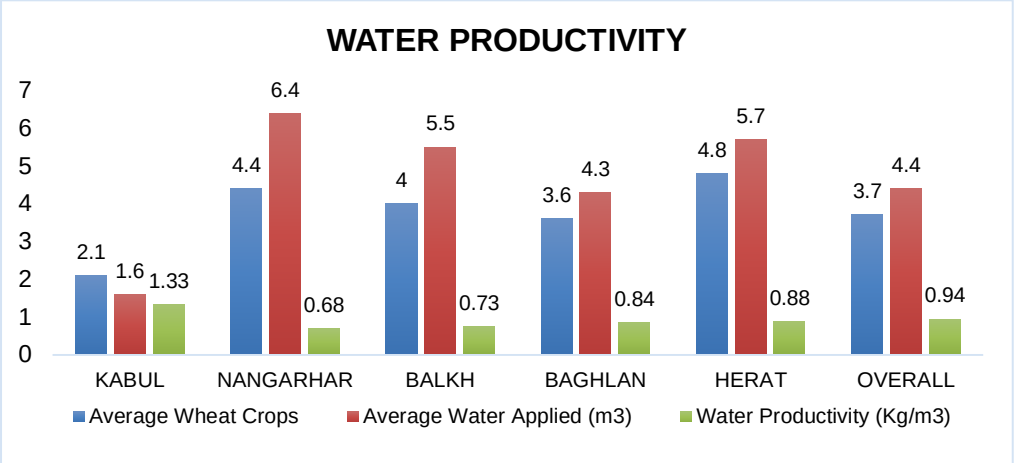

Figure 1: Water Productivity Values of Wheat Crop for Five Regions
(Source: On-farm Water Management Project)

In general, the CWP figures are comparable with the international potential CWP values of the wheat crop. It also reveals that water productivity has improved by in these schemes by about 27% compared to the nationwide assessment of water productivity carried out about five years also. The previous assessment carried out by FAO's TCP/AFG/3402 Project has been presented in Table 1 below.

Table 1: Summary of Crop Productivity and Water Productivity of Different RiverBasins

No.	River Basin	Productivity (Mt/ha)		Water Productivity (kg/m3)		
		Irr. Wheat	Rfd. Wheat	Irr. Wheat	Rfd. Wheat	Overall
1	Panj Amu Basin	2.8	1.3	0.31	1.01	0.83
2	Northern Basin	2.5	1.0	0.29	1.07	0.82
3	Harirod Murgab	2.4	1.2	0.36	1.29	1.04
4	Helmand	2.5	0.9	0.14	2.09	0.38
5	Kabul	3.3	1.1	0.35	0.88	0.41
	Afghanistan	2.4	1.1	0.25	1.12	0.74

(Source: FAO and MEW, 2015)

This indicates that the progress in the intervened sites are going in the right direction. Moreover, new large-scale irrigation schemes such as Khush Tepa irrigation scheme, meant to irrigation up to 800,000 ha of land in the North, Musa Qala and Zameen Dawar irrigation schemes will be mostly using modern irrigation system with high water productivity. Arghandab Irrigation Scheme, which is famous for its best export quality pomegranates has alsonow been switched to high efficiency irrigation system through the funding from the Asian Development Bank.

5. PARTICIPATION AND RESILIENCE AGAINST NATURAL DESTRUCTIVE FORCES

The policy also encourages and enables involvement of relevant stakeholders at all stages of irrigation planning, development and implementation as well as in decision-making processes in the irrigation sector. It promotes and facilitates the participation of women in all aspects of irrigation management and investment decision-making. It also encourages and facilitates increased private sector involvement in irrigation development and management, particularly the national private sector, to accelerate the modernization of the irrigation sector including engagement in: (i) studies; (ii) design and construction supervision; (iii) modernization of existing schemes and

construction of new irrigation schemes; (iv) operation and management; and (v) other support services.

The policy also emphasizes in developing adequate technical capacity across stakeholders. It stresses on developing and implementing measures to raise public awareness and addressing capacity constraints across relevant public and private sector institutions and stakeholders, including agricultural schools. It also aims to develop, implement and promote standards, specifications, manuals, codes of practice and guidelines required to achieve its objectives and to harmonize the interventions by various sub-sector, both public and private.

The policy document also urges the government to evaluate and take into consideration the impacts of climate change and variability on irrigated agriculture, to ensure that (i) climate change impacts are mainstreamed in sector planning; (ii) the adaptive capacity and resilience of rural communities is strengthened; and that (iii) hydraulic infrastructure is designed to withstand projected change.It also intends to develop tools and processes to (i) help ensure that measures, as may be introduced, appropriately consider established rights and uses, both within irrigation systems and beyond; and (ii) support the timely identification of emerging trends and opportunities within the agricultural sector and beyond, including point- and non-point sources of pollution.

With all these policy measures in place, the execution of irrigation development and management works, if carried out properly will inevitably higher level of participation of all stakeholders and make the country more resilient against naturally destructive forces.

6. DISCUSSIONS: MERITS AND DEMERITS OF THE POLICY MEASURES

Even though this policy has put in place many measures that are expected to uplift the irrigation sector of Afghanistan, it has also brought about some challenges for the government. Firstly, this policy urges the government to rehabilitate, modernize and expand the irrigated lands by developing infrastructure. The main challenge in this process is to make arrangements for all the necessary financial resources. The poor farmers will not be able to pay for this and so the government will have to mobilize the necessary funds from national and international donors.

The policy developed is aligned with the government's priorities and can be responsive to the irrigation challenges of Afghanistan. However, the Water Law is under review, and roles and responsibilities of various ministries might be amended there. It is therefore required that, once the water law is finalized, the irrigation policy be also reviewed by all relevant stakeholders to again align it with the new water law.

Similarly, the policy also urges the government to introduce legal and institutional reforms in the irrigation sector and emphasizes on more involvement of stakeholders including women and private sector player. This is certainly a move in the right direction. However, it cannot be achieved overnight. These reforms are very time-consuming and cannot be achieved without coherent planning and programming. Likewise, the efforts made by the government so far toward privatization has resulted in mixed results. Hence, it is evident that in order to materialize the policy measures, the government needs to be fully committed in its implementation and it also needs to be supported from all sides.

MAIL is the lead agency responsible for the implementation of the policy while Supreme Council on Land, Water and Environment oversees, guides and monitorsits implementation. Even though other related ministries and departments arealso

expected to implement the Policy and associated programmes and projects, it is quite evident that the policy cannot be successfully implemented without coordinated efforts of all the line ministries.

The validity of this policy document is for 12 years starting from 2018 going up to 2030. This timing has been selected with the idea of aligning the end date with other national and international plans and programs. Even though this may seem like a significant time duration,the clock has already started to click andconsidering all that is mentioned in the document, this period is still shortfor all that needs to be done.

7. KEY FINDINGS AND SUGGESTIONS FOR THE FUTURE

The promulgation of a national level policy for irrigation by the Afghanistan government is a very welcoming move. The document is quite concise but comprehensive. It has not only filled the policy gap that remained for four decades but also identified the programmatic priorities of the country's irrigation sector It clearly stated its goal, objectives and implementation arrangements including its responsibilities, implementation instrument, monitoring, validity and amendments.In the process, it has also put pressure on the government to work in a planned and systematic mode.

The priorities outlined in the policy documents are in the right direction. They are aligned to facilitate and guide the required interventions and contribute to more equitable and sustainability development of the irrigation sector of the country. However, the set objectives cannot be achieved without proper commitment from all sides.Better coordination and clarity in mandates of all water related ministries i.e. MAIL, Ministry of Energy and Water (MEW) and Ministry of Rural Rehabilitation and Development (MRRD) in essential for effective implementation of the policy. The memorandum of understanding between MAIL and MRRD is a good development, where small community scale irrigation systems are developed by MRRD while medium to large scale systems will be developed by MAIL.

The policy direction of increasing the productivity of irrigated agriculture and the measures proposed for enhancing water productivity are appropriate and have even started to show some positive indications. However, measures must be in place for sustaining the achievements which can be done through local scale institutional arrangements and proper engagement of the concerned irrigation associations in the planning, implementation, as well as operation and maintenance of the irrigation schemes.

Efforts made so far towards private sector engagement has not been very successful. It indicates that it is challenging to engage private sectorin the irrigation sector in the context of Afghanistan. However, it iscrucial,and mechanism needs to be explored to encourage private sector to invest in some aspects of the sector.

Considering the present status of the execution of National Irrigation Policy 2018, the following few steps are suggested due considerations:

- Preparation of the irrigation sector roadmap and an investment plan that provides the details and guides the investments into the irrigation sector.
- Re-organization of the irrigation directorate to support the implementation of the irrigation policy

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