DECLARATION

I, hereby declare that this thesis entitled "**Climate change impact on irrigation water requirement and crop water productivity of rice**" is a bonafide record of research work done by me during the course of research and the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society.

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Date: (2021-18-003)

CERTIFICATE

Certified that this thesis entitled "**Climate change impact on irrigation water requirement and crop water productivity of rice**" is a record of research work done independently by Er. Midhula B N (2021-18-003). under my guidance and supervision and that it has not previously formed the basis for the award of any degree, diploma, fellowship or associateship to her.

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MIDHULA B N

Dedication

Dedicated to all the farmers who tirelessly provide food for the world and to all agricultural engineers striving to advance agriculture.

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SYMBOLS AND ABBREVIATIONS

<	:	Less than
>	:	Greater than
%	:	Percent
%/day	:	Percentage per day
≤	:	Less than or equal to
≥	:	Greater than or equal to
×	:	Multiplication
°	:	Degree
°C	:	Degree Celsius
AR	:	Assessment report
B	:	Biomass
CC	:	Crop canopy cover
CCx	:	Maximum canopy cover
CGC	:	Canopy growth coefficient
cm	:	Centimeter
CMIP	:	Coupled model inter-comparison project
CV	:	Coefficient of variation
CWP	:	Crop water productivity
E	:	East
ESRI	:	Environmental Systems Research Institute
ET_o	:	Reference crop evapotranspiration

et al.,	:	and others
etc	:	et cetera
ET_c	:	Crop evapotranspiration
FAO	:	Food and Agriculture Organization
Fig.	:	Figure
GCMs	:	General circulation models
GIS	:	Geographic Information System
h	:	Hour
ha	:	Hectare
HI	:	Harvest index
HI_0	:	Reference harvest index
ICAR	:	Indian Council of Agricultural Research
i.e.,	:	Which is to say, in other words
IPCC	:	Intergovernmental panel on climate change
IWR	:	Irrigation water requirement
KAU	:	Kerala Agricultural University
K_c		Crop Coefficient
KCAEFT	:	Kelappaji College of Agricultural Engineering and Food Technology
KcTr	:	Crop coefficient for transpiration
kg/ha	:	kilogram per hectare
Km/day	:	Kilometre per day

m	:	Meter
m^2	:	meter square
mm	:	Millimeter
N	:	North
P_{eff}	:	Effective rainfall
Pr	:	Precipitation or rainfall
R^2	:	Coefficient of Determination
RCM	:	Regional climate model
RCP	:	Representative concentration pathway
RMSE	:	Root mean square error
s	:	Second
SSP	:	Shared socio-economic pathway
t/ha	:	Tons per hectare
t/m^3	:	Tons per meter cube
T_{max}	:	Maximum temperature
T_{min}	:	Minimum temperature
USDA	:	United States Department of Agriculture
viz.,	:	Namely
WP	:	Water productivity
WP*	:	Normalized water productivity
Y	:	Yield
yr	:	Year